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Logistics principles vs. legal principles: frictions and challenges

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Abstract

Purpose – Logisticians propose changes to improve supply chains, and legal practitioners do likewise, but from a different perspective. Proposals from one domain increasingly have an impact on the other due to e.g. globalization – but cross-disciplinary knowledge often seems limited. The purpose of this paper is to facilitate interaction between the domains by increasing the level of joint understanding of the principles used in each domain, and to look at the potential frictions and challenges.

Design/methodology/approach – Management principles for efficient logistics and supply chain management as well as key principles governing the legal systems are summarized on both a paradigmatic and an action level. Illustrations from practice are presented. These have been obtained by a cross-functional team which has interviewed both logisticians and lawyers. Findings are based on cross-functional comparative analysis of principles and illustrations.

Findings – Frictions between operational principles were found to exist in each domain, with some principles harder to reconcile than others. There are also challenges between the two paradigms of logistics and law that influence the operational principles.

Research limitations/implications – One implication is that the knowledge gap, challenges and frictions between the professions and domains, both in practice and academia, would benefit from more research.

Practical implications – Although it may seem trivial, logisticians and lawyers need to cooperate better. The research shows on a fundamental level, with practical examples, the challenges and frictions that occur.

Originality/value – The cross-functional approach with law, and the discussion and comparison of principles.

Keywords Taxation, Belief system, Business law, Fiscal principles, Functional silos, Logistics principles, Supply chain principles, VAT

Paper type Conceptual Paper

1. Introduction

1.1 Background

Logisticians propose changes in structures, processes and management components to improve global supply chain effectiveness (e.g. Lambert *et al.*, 1998). General action-oriented management principles and "rules of thumb" within the logistics domain are often used to increase effectiveness: principles such as postponement, speeding up lead times, simplifying and compressing logistics structures, modularization, and strengthening integration and collaboration (La Londe and Mason, 1985; Persson, 1995; Anderson *et al.*, 1997; Abrahamsson, 1999; La Londe, 2003; Kotzab and Otto, 2004).

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Another domain of practictioners is that of the legal and fiscal experts. Some of these experts are working with business law in the same companies as logisticians, while others work in courts or in law firms. Members of the legal profession also have shared values, frameworks, principles etc. governing their attitudes and actions.

Although these two different professions hardly seem to interact, they act in a way which impacts on each other. Trent (2004) cites law as an example of an area which interacts with logistics. Van Hoek *et al.* (2008) ask for more research regarding the internal alignment between logistics and the legal function, as they consider there to be a lack of research performed in this interface. Sanders and Wagner (2011) ask for multidisciplinary research to address contemporary global challenges, e.g. supply chain finance and global supply chain management influenced by taxation, protectionist laws and trade barriers. In practice, there do exist examples of increased interaction. Major consultancy firms, such as McKinsey (Diederichs and Leopoldseder, 2008), stress the interaction between physical network design, the legal form and tax residency, and organization and governance structures as very important for global supply chains. Other consultancies propose tax efficient (or aligned) supply chain management (e.g. KPMG, Deloitte, Grant Thornton). They propose a redesign of the logistics systems based on tax effectiveness and thus with a very different purpose than logisticians. We have also found examples of tax consultants publishing articles in practitioner-oriented journals (e.g. Banker, 2009; Griffith and Stewart, 2009; Irving *et al.*, 2005) and books (e.g. Petriccione, 2008) that address supply chain issues.

Lately Henkow and Norrman (2011) carried out a legal analysis of tax issues having an impact on a company's global supply chain. They showed how the weak alignment between the domains created an extra workload for logisticians and led to less environmentally sustainable solutions. Our observations are that although the interface between these domains is receiving more attention in practice, both have developed their internal knowledge and "paradigm" more or less in isolation from each other (Nerd Olander and Norrman, 2008). Our review of scientific journals from each domain reveals only a few multidisciplinary contributions.

We believe that cross-functional cooperation, and the performance of supply chains, would benefit of an increased understanding of the other domain and its "paradigm". This paper discusses, on a more abstract level, the importance for logisticians and legal professionals to understand the agreements and disparities of their different "points of departure", as well as the challenges and frictions that interfering principles or rules might lead to. Its contribution lies in exploring challenges and frictions, giving illustrations and conceptually arguing about their relevance, rather than entering into a more detailed legal analysis as in Henkow and Norrman's (2011) and Olander and Norrman's (2012) analyses. The aim of the paper is to facilitate interaction between the domains by increasing joint understanding of the domains and their interface.

1.2 Approach and framework

To structure the discussion, a conceptual model will be used (Figure 1). We will use constructs such as "points of departure", "belief system", laws and "principles", well aware of the difficulty of being fully consistent regarding the differences between them. We are inspired by the framework of Petrusson (1999), further developed by Nerd Olander and Norrman (2008). Petrusson argued that both law and business consist of an abstract belief system containing common points of departure (including attitudes, theories and overriding principles and norms), while the action system reflects the

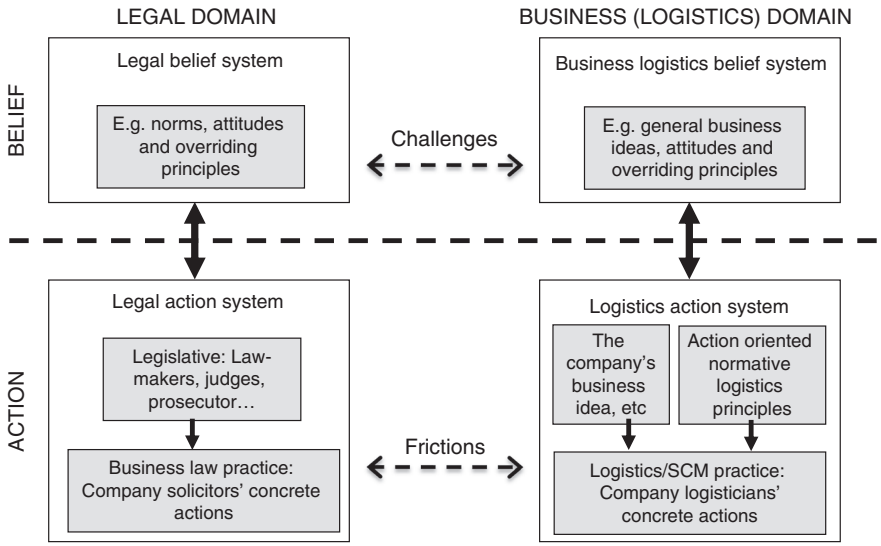

Figure 1.
The legal and business logistics belief and action systems

day-to-day actions of practitioners (guided by action-oriented operational principles). A similar distinction was made by Mentzer *et al.* (2001, p. 11), separating supply chain orientation (management philosophy) from supply chain management (all management actions taken to realize the philosophy). The constructs on the abstract belief level are more implicit and become embedded into the mindset of those practising in the domain. We apply more normative action-oriented logistics and supply chain management principles and specialized action-oriented rules and regulations to the action level of the systems (Figure 1). The abstract system impact the practice, as general beliefs and attitudes guide perspectives and frameworks used in the action system. When discussing the disparities that lead to problems, delays etc. in the action system, we use the term friction, while those connected to the more abstract belief system are called challenges.

Based on this, the purposes are:

(1) to increase the understanding in each domain of the other domain's "point of departure" and guiding action-oriented principles; and

(2) to point out some frictions and challenges between the two domains of which professionals and academics should be aware.

1.3 Limitation of scope

There are many areas of law that impact on the realization of an efficient supply chain. However, in the legal scientific research tradition, it is not possible to make an authoritative statement as a researcher on the legal position outside the sphere of specialization. With the multidisciplinary approach of the present study we are able to provide authoritative statements mainly in the areas of tax law and of logistics. Hence, the present study is limited as far as the legal action systems are concerned, to the fiscal systems (but with one illustration from contract law). Observations from this system will be reflected on when discussing challenges in the belief system.

1.4 Outline of the paper

Next follow reflections on methodology. Part 3 addresses purpose 1 by summarizing the general "point of departure" for logistics and more action-oriented principles to increase supply chain effectiveness. A corresponding overview of "point of departure" for law and justice in general, and fiscal systems in particular, is given, followed by more action-oriented rules, laws and principles. Part 4 includes illustrations from practice where implementation of action-oriented logistics principles did not go as planned due to fiscal impact. Part 5 addresses purpose 2 by discussing action-oriented principles that could create frictions between the domains, and pointing out some challenges and gaps where the explanation could be further linked to different "points of departure" and beliefs. Finally, conclusions and future research are discussed.

2. Methodology

A multidisciplinary and explorative research approach has been used for research design, data collection, and data analysis. The conceptual findings respond to the aim of developing our cross-functional understanding. The empirical illustrative anecdotes should exemplify the discussion with real-life situations, and could be a stepping-stone for further studies and development of theories and tools in the intersection of the domains.

First, literature reviews in both fields have been carried out. This revealed very low interaction between the academic domains. We found only about a dozen articles published between 1995 and 2013 in major logistics and purchasing journals (*IJPDLM*, *IJLM*, *JBL*, *IJL:RA*, *JSCM*, *JPSM*, *IJPM*) relating to the legal area. They were mainly related to the changes in trade areas, such as NAFTA (Waller and Emmelhainz, 1995), EU (Bagchi and Skjott-Larsen, 1995), and China's membership in WTO (Carter *et al.*, 1997; Goh and Ling, 2003; Lau and Zhang, 2006); mentioning customs as complicating factors when conducting trade globally (Das and Handfield, 1997; Sawhney and Sumukadas, 2005; Ruamsook *et al.*, 2009; Hausman *et al.*, 2010); mentioning tax and tariffs when discussing factors for localization (Bhatnager *et al.*, 2003) or global production planning (Miller and de Matta, 2008); or the issue of where logistics service companies should register (flagging out behaviour) for ships (Jing Haider, 2013) or trucks (Einbock, 2006). Reiche's (2012) dissertation addressed VAT in combination with multinational corporations' logistics networks. Olander and Norrman (2012) have analysed the contracts in an innovative fourth party logistics set-up from a legal perspective. Also in the textbooks reviewed, cross-disciplinary examples are few, with INCOTERMS as a common exception.

Second, articles we were aware of (or found with key words like "logistics principles" and "supply chain management principles" and screened to see whether they presented an explicit list of normative principles) were reviewed to create a framework of normative action-oriented principles in logistics and SCM. Ultimately, six sources were used to exemplify such principles (La Londe and Mason, 1985; Persson, 1995; Anderson *et al.*, 1997; Abrahamsson, 1999; La Londe, 2003; Kotzab and Otto, 2004). Kotzab and Otto (2004) was itself based on a literature review and had already synthesized and prioritized principles. The sources were authored by academics and published in academic journals or trade journals which indicate their relevance for both academia and practice. Other action-oriented principles could exist or evolve later. But as the aim was not to investigate and define all potential principles, rather to increase joint understanding of the action-oriented principles influencing each domain, we think

these principles give the legal domain a basic understanding of logistics domain. The principles found were discussed and distilled to minimize overlaps (see the Appendix).

Third, the focus was on principles of law and justice and characteristics of the discipline of law which are, within the legal sciences, a separate field of research. In the present context, it suffices to rely on commonly agreed descriptions and definitions (see Dahlberg, 2007 and Thuronyi, 2003) to illustrate the legal paradigm and action-oriented operational fiscal principles. As the main researchers have both worked in global management consulting firms as well as in academia, insight into the culture of both domains has been acquired.

Fourth, to explore gaps, challenges and frictions, and to obtain empirical data for the illustrations, an explorative study was conducted. We searched for examples where either a final solution had been perceived as "wrong", never was implemented due to problems between the domains, or where they have cooperated to find solutions. We used convenience sampling in the form of snowball sampling (Bryman and Bell, 2003, p. 105). Logisticians or lawyers on a high organizational level in companies with already observed frictions were contacted. They were also asked to suggest other contacts they knew had faced similar challenges. Semi-structured and recorded interviews took place with 25 individuals from 11 companies in 19 interviews (one to three hours each). Interviews were conducted, transcribed and analysed by a multidisciplinary research team. A full day "cross-functional workshop", including different group interviews, was also performed with one company where 15 practitioners representing logistics and supply, legal affairs, finance, tax, trade compliance, and customs attended. In total 35 different practitioners were involved.

The illustrations represent the most crucial frictions and challenges brought up by the respondents.

Fifth, the analysis, aiming to find illustrations that point out frictions between the domains in normative principles as well as to create mutual knowledge about challenges within "points of departure", was multidisciplinary comparative discussions. Regarding the challenges between the domains in the more abstract belief system, our multidisciplinary reflections are based both on observations from the action system and on differences in the more abstract belief system, from insights gained when comparing action-oriented principles and insights gained during the cross-functional discussion within the research process.

Of the 19 different illustrations collected (available in Flodgren *et al.*, 2010) only six are reported in this paper (due to space restrictions). Insights from all have influenced our conceptual discussion. Two of the illustrations are analysed in more detail, from a legal point of view, in Henkow and Norrman (2011), another in Olander and Norrman (2012).

The qualitative approach used limits our chance to statistically prove, and generalize, that some combinations of principles are more problematic than others. The findings should instead be connected to theoretical discussion (Yin, 1994) and conceptual reflections. In this early phase of multidisciplinary research, the illustrations provide more empirically grounded and richer examples of challenges and frictions than pure desk-based anecdotal evidence.

To increase trustworthiness, the focus has been on credibility, transferability, dependability and confirmability (Halldórsson and Åstrup, 2003). By letting respondents check illustrations and further comment on them (where the recorded interviews did not give clear or consistent pictures), credibility was increased. Preliminary findings were

presented at a practitioner conference with about 150 attendees. Hence our observations and reflections were "tested" on other practitioners as a way to understand and increase their transferability. The research approach is described, which addresses dependability. A problem with confirmability (whether conclusions and interpretation can be traced back to sources) is that companies are anonymous. Trustworthiness could be challenged if the principles discussed do not seem relevant from the internal perspective of a particular domain, if the illustrations are not relevant, or if the comparative discussion is not clear or does not lead to the proposed conclusions. From a legal methodology perspective, it is important to note that the resulting illustrations are just that, illustrations, and thus employees' perceptions of legal consequences. These have not been tested using a traditional method of jurisprudence. But the legal perceptions may well be reflections of the law as practised; if not the law as it stands (see Strandet Jepsen, 2010, p. 32).

3. Points of departure, beliefs and principles

This part addresses the first purpose, to increase the understanding in each domain of the other domain's "point of departure" and guiding action-oriented principles.

3.1 SCM and logistics points of departure and principles

The point of departure for logistics is to support the company's strategic objectives (Schary and Skjøtt-Larsen, 2001, p. 22). The selected strategy differs among firms, but competitive advantages can be created through e.g. differentiation, cost leadership or focus strategies (Porter, 1980). They can be based on resources (Barney, 1991) or hypercompetition (D'Aveni, 1994). For logistics this often boils down to maximizing profitability and profit through cost minimization, reduction of tied-up capital or increased sales through market growth related to expansion of the product range, service offerings or the geographical area. Leaving aside general business strategies, the points of departure for logistics and SCM could be expressed as: flow focus, process orientation, finding synergies between the companies along the supply chain, taking a systems approach etc.

Those general beliefs have been operationalized into more normative action and management oriented logistics principles for performance improvement (see the Appendix). Examples of those principles, where we found empirical illustrations showing that could create frictions with the legal domain, were:

Speed up or re-distribute lead times (Persson, 1995; Abrahamsson, 1999; Otto and Kotzab, 2004), with focus on lead time to motivate changes, as it is an easily measured and understood construct. As time normally drives uncertainty and cost in logistics processes, it could be reduced in many ways: going from sequential activities to parallel, reducing waiting time between activities, reducing activity time by simplification, eliminating activities etc.

Postponement (La Londe and Mason, 1985; Persson, 1995; Anderson *et al.*, 1997; Kotzab and Otto, 2004), meaning that an activity, such as differentiation, is carried out as close to the customer's actual need in time and locus of consumption. One example is to store centrally until you know where the customer is, or move value-adding that gives a product customized characteristics as late as possible.

Simplify and compress logistics structures and networks (Persson, 1995; Abrahamsson, 1999; Otto and Kotzab, 2004), which means to reduce logistics decision elements, such as number of variants, suppliers, components as well as length and width

of the supply chain (compressing number of nodes and actors). One example of simplification has been centralized warehousing; another is standardization of processes and products.

Modularize products (Persson, 1995; Otto and Kotzab, 2004), which is connected to simplification, but more specifically when a number of components are grouped into a module, where different modules then can be combined into a variety of products or processes. The result is fewer decision elements.

Simplify administration and transactions (La Londe and Mason, 1985; Persson, 1995; Abrahamsson, 1999; La Londe, 2003; Kotzab and Otto, 2004). Logistics activities are transaction intensive, and by minimized and simplified administration those could be made more effective. Administrative lead-time should be striving for nil, or at least not delay the physical processes.

Outsource and source strategically (La Londe and Mason, 1985, Anderson *et al.*, 1997; La Londe, 2003). By strategic sourcing and outsourcing, investment, costs and risks can be shifted to/shared with suppliers.

Integrate processes and increase collaborative behaviour with supply chain partners (Persson, 1995; Anderson *et al.*, 1997; Abrahamsson, 1999; Kotzab and Otto, 2004). As companies become more specialized it is important to find inter-organizational coordination mechanisms between the independent decision making units that drive the supply chain towards a synchronized horizontal flow, instead of a traditional "command-and-control structure". Processes and activities could be integrated, and the intensity and scope of collaborative behaviour increased.

3.2 Legal points of departure and principles

The overriding legal principles applicable in the present context can be traced back to the Romans (Maine, 1874). These overriding principles, and the tradition that they entail, also bring about some characteristics of the paradigm of the legal profession. These points of departure and characteristics in the belief system are outlined below. It deserves to be pointed out that these are overriding principles rooted in western society, and do not necessarily reflect the legal tradition or the role of the legal systems in other societies (compare Tridimas, 2006).

The overriding principles of the rule of law, including in turn the principles of legal certainty, foreseeability, and protection of legitimate expectations, are fundamental in Western societies, and serve to ensure that results must be foreseeable and non-retroactive. Individuals must be able to foresee what consequences in law their actions have. If an individual can legitimately expect a certain outcome, he has, in principle, a right to be treated accordingly. As a consequence, legislation that imposes obligations on individuals cannot be taken retroactively (Tridimas, 2006; Vanistendael, 1996).

The overriding principle of equality under the law is a necessary corollary of the rule of law. It provides that all individuals shall be treated equally – justice is blind. This principle provides that equal situations and actions should be judged equally, and unequal situations and acts shall be judged proportionally unequally (Tridimas, 2006, Chapter 2; Vanistendael, 1996).

The overriding principle of ability to pay is fundamental in Western societies (compare Musgrave and Musgrave, 1989, Chapter 13; Vanistendael, 1996). Citizens should contribute to government in accordance with their ability to pay. Consequently, someone without ability to pay should not be taxed.

Maxims of a good tax system: as expressed by Musgrave and Musgrave (1989, p. 216), a good tax system should be designed so as to meet the requirements of equity in burden distribution, efficiency in resource use, goals of macro policy and ease of administration.

Conservatism: as the main point of departure of the above principles is the law itself, and not (the ever changing) society as such, there is an inherent characteristic in law of looking at the past, the law and its enactment, rather than future activities.

Ex-post perspective: the judiciary, and the legal profession and education, is characterized by solving conflicts or issues arising after they have occurred, i.e. an *ex-post* perspective (indeed, some legislation is enacted to provide the actors in society with guidance and rules for their economic activities).

Legal systems are in principle national: jurisdiction over persons is typically based in national laws. Laws are, at least in Western democracies, enacted by an elected parliament. The constitution of a country determines the overall framework of rights and obligations of the country's citizens and legal persons established within the country's territory. Thus, a general feature of legal rules is that they are national, or federal, in the case a nation is part of a federation or con-federation which operates under a common constitution (e.g. the US and the European Union).

More operational action-oriented principles can also be established with regard to the fiscal area, both in indirect taxation (including value added tax, VAT), and in international direct tax law (entailing the corporate income tax, CIT, which is of certain importance in supply chain management). They guide the material content of the laws enacted. While CIT can be seen as a cost for companies, VAT, as a tax on consumption, should in principle be cost neutral for all companies along the supply chain, except for the final customer that consumes the product. States can legitimately raise claims on taxes in certain situations based on the following principles:

The principle of domicile: the state where an individual is resident or a company is registered has a taxing right over the income of the individual or company worldwide (Miller and Oats, 2012; Ault, 1992).

The principle of source (residence): the state where the income of a company has its source has a right to tax the income. It is generally agreed that only when a company has a sufficiently permanent connection to the source state's territory (referred to as a permanent establishment, PE) does the source state have a taxing right (Miller and Oats, 2012; Ault, 1992).

The principle of territoriality: this principle (less important today (Thuronyi, 2003, p. 287)) states that the state in whose territory an activity is carried out has the right to tax the income from the activity (Monsenego, 2012).

The arms-length principle: this principle is the fundament upon which the division of income rests: every internal transaction between PEs in different states or companies belonging to the same group of companies shall be priced at arm's length so that the income at one establishment or company is the same as if the company or establishment had been independent from its foreign parent company or head office (Miller and Oats, 2012; Chapter 15 and OECD, 2010).

Type of goods: goods are classified according to type, in a worldwide harmonized nomenclature, and their origin is also determined (Moëll, 2008). Customs restrictions, such as tariffs and duties, are determined based on type of goods and rule of origin.

Rule of origin: the place of origin of a good has an impact on customs treatment.

Principle of destination: a supply should be taxed (for indirect tax purposes) at destination, which is said to correspond to where the supply is typically consumed (Ebrill *et al.*, 2001). In VAT, the principle of destination is guiding taxation.

4. Cross-principle illustrations from logisticians' action system

Our empirical investigation illustrated that when practitioners try to implement logistics action-oriented principles it can create unexpected administration, be unprofitable or impossible due to the local legal context – friction arises. Below follow short illustrations of frictions from the action system between logistics principles and fiscal laws and regulations. Please note that the legal consequences are described as perceived by the persons interviewed.

Simplify and compress structures vs source

A large and industry-leading European company manufacturing heavy equipment for handling fluids and heat in various customer industries (such as food, energy, environmental protection) around the world, had the idea of creating a globally coordinated stock for spare parts with locations on three continents (Europe, Northern America, and Asia). A spare part should be located where it was most in demand, but be able to be shipped to wherever needed. The inventory should be pooled and owned by one "manager". The logistics principle driving this was to simplify and compress structures. The tax advisors and financial department argued that this was more or less impossible to implement due to where profits should be placed and taxed. The profit from the sales of spare parts would, due to the tax principle of source, be allocated differently from under the old set-up, with some risk of higher CIT. The risk-avert fiscal employees focused the positioning of profit and tax, while the logisticians focused on efficient goods flows. As they never found a joint solution, the result became three separate warehouses with independently managed inventories without much synergy.

Simplify and compress structures+speed up lead time vs territoriality

A large and industry-leading European company manufacturing heavy equipment had a spare parts inventory in Singapore, but planned to move it to China to get closer to both the growing Chinese market and to their current big Japanese market. The logistics principles driving it were to compress the structure and hence speed up lead times to customers. But as the indirect tax, VAT, paid for import into China, due to the Chinese regulations, could neither be deductible nor refundable for re-export, the VAT would create an extra cost instead of being cost neutral. Hence China was not an option for a regional warehouse although it was a good location from a logistics network point of view. The legal principle of territoriality creates friction to the logistics principle of simplifying and compressing structures.

Simplify and compress structure+speed up time vs domicile+destination

When a company has defined their legal structure and business processes on the basis of CIT and the principle of domicile (e.g. the idea to make profit where they have major costs, such as R&D for R&D-intensive companies), this in combination with VAT (the principle of destination) could lead to logistics flows that create extra transportation work and increased lead times.

A large and industry-leading Swedish manufacturing company selling systems shipped one of the subsystem's batteries (quite heavy and also dangerous goods) from a supplier in the USA to Sweden and then shipped them back again to US customers, instead of using drop shipment inside the US. The reason was that the non-refundable cost for the extra sales tax created for an internal transport (due to the US rules and the principle of destination) was much higher than the transportation cost. If the goods are sent directly from the supplier to the customer, the Swedish company will incur sales tax on the invoice from the supplier, which is not refundable or deductible as the Swedish company was not a registered taxpayer for retail sales tax purposes. When exported out of the US and re-exported back, there would be no sales tax. From a logistical point of view, this extra transportation contradicts the principles of compress structure and speeding up lead times, and it also adds extra cost and environmental impact. Hence there is friction between the logistics principles of simplifying structures and speeding up lead times, and the combination of fiscal principles of domicile and destination (this illustration is more fully described and analysed in Henkow and Norrman, 2011).

Outsourcing+compress structure vs domicile+source+territoriality+destination

Outsourcing in multiple tiers is common in supply chains, but could make things more difficult than expected. A large and industry-leading company (Figure 2, Z-Corp) with headquarters in Sweden (and activities all over the world) sells a communication system to a Chinese company. The headquarters is the contract owner for this type of business (depending on the tax structure chosen, where they want profit and corporate income tax in the country where most cost (R&D) is generated). Z-Corp buys this specific product (that can be used both as stand alone and embedded in a larger system) from another company whose contract owner is in a third country.

This seller has outsourced its manufacturing to an international contract manufacturer, which currently makes this product in a Chinese factory just a short distance away from the final customer. Z-Corp proposes a short drop shipment from the manufacturing plant to the customer. But due to the different companies' tax structures for CIT (impacting the companies' policies for who are the contract owners in the different deals), and international tax rules for indirect tax (VAT etc.), the products

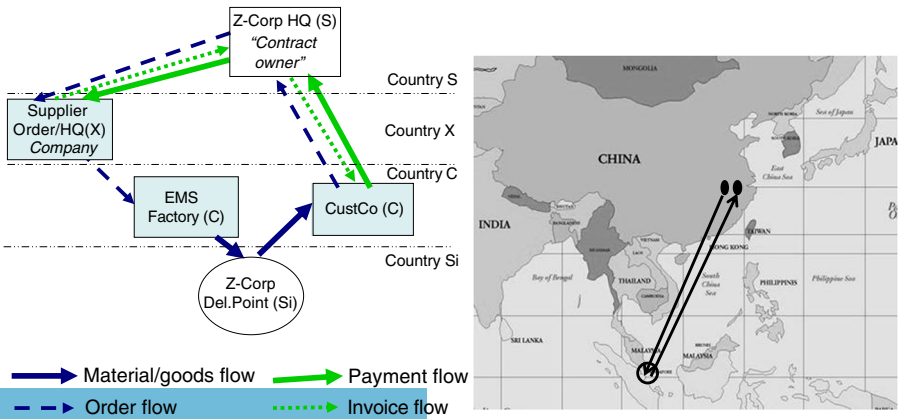

Figure 2.
Multi-tier outsourcing combined with tax planning creating extra goods flows

must physically pass Z-Corp's hub in Singapore to make sure all taxes are paid in the right country. From a logistical point of view, this extra transportation contradicts the principles of compress structure and speeding up lead times, and it also adds extra cost and environmental impact. The principle of outsourcing further complicates the supply chain, and the understanding of how fiscal principles of e.g. domicile, source, territoriality and destination will impact (this illustration is more fully described and analysed in Henkow and Norrman, 2011).

Postponement+modularization vs type of goods

Different types of products and components are divided into different customs classes by national authorities, resulting in that the cost for import or export differs. Putting different components together in modules could have an impact (positive or negative) on the classification and hence on customs duties. One example is the increasing combination of hardware (HW) and software (SW) in products, where the SW is increasingly the component delivering value to the customers. Customs duties may apply to HW but not to SW, unless SW is installed on the HW. Further, what is defined as SW differs between countries, making it important to know where (point of origin) and how the value is added. A large and industry-leading European company sold equipment for telecom infrastructure to the USA. This kind of equipment is a combination of HW and SW where SW over the years has gone from a small part to the major part adding value for the final customer. SW can be installed either at the production plant or later when the system is installed. If the SW installation is postponed, more updated versions of the SW can of course be used. For telecom HW customs was 12 per cent. If the SW had been installed before shipment, the product would instead be classified by the authorities as high computing systems, where customs was 0 per cent. By shipping it as a combined product, total cost was reduced considerably. But this solution goes opposite to the logistics principle of postponement (where SW could have been loaded later if new upgrades were launched, customization needed etc.). In another example the customs for HW was 12 per cent and for SW 0 per cent. If the product value is 100 million euros, customs will be 12 million euros if the system was classified as HW as it traditionally has been. But recently the SW part of the value is 90 million euros. If the SW were instead put on a CD, the final customs would only be 1.2 million euros. This is an example where logistics principles such as postponement and modularization have to be analysed together with fiscal principles as type of goods and rule of origin to find the optimal solution for each specific flow.

Simplify and compress structures vs rule of origin

With many available sources for a standard component, companies' purchasers might choose multiple sourcing to secure supply and get competitive prices. To simplify administration and optimize inventory management (pooling of demand leading to decreased uncertainty/standard deviation), logisticians in many companies try to standardize and minimize the number of stock keeping units (SKUs) by having one article number for all identical components regardless of supplier or manufacturing plant. The custom's requirements of clear tracking of point of origin hinder this because different SKU numbers are needed for different sources of supply, which could make it impossible to pool demand for similar components. Furthermore, administration increases with the number of SKUs.

Integrated processes+innovativeness vs arms-length principle+conservatism

A logistics service provider (LSP) and its client formed a new complex inter-organizational structure to handle the client's global supply chain. The LSP was managing the physical flow, but the operational handling of the goods was done by asset-based transportation and warehousing sub-providers. In addition the LSP carried out many administrative services and also took ownership of the goods and sold it to retailers on terms agreed upon by the client and the retailers.

There was a logistics contract between the LSP and the client, and between the LSP and its asset-based sub-providers. The structure also included contracts between the client and the retailers as well as the suppliers producing the goods according to the client's desires. Those contracts defined the conditions of the LSP's selling and buying of the goods.

When companies reacted from one legal perspective (e.g. sales law) they introduced actions affecting another legal perspective (e.g. commercial agent). The non-mandatory rules in sales law were replaced by a clause that made the client responsible for all sales claims made by the retailers. But the client's different deals with the producers and with the retailers concerning conditions for the LSP are, from a legal analysis, not binding on the LSP but only on the parties taking part in it. To handle this, an agreement between a principal and a commercial agent was drawn up. However, based on legal analysis some doubts can be raised about this agreement's legal validity. In the absence of legislation for liability of freight forwarding agents for damages to the transported goods, the LSP and the client agreed to make use of a standard-form contract (NSAB, 2000). But this was not designed for this relationship, since the LSP owned the goods and therefore did not act as a freight forwarder. As goods owner the LSP took on other roles than the standard-form contract was developed for and did not mediate transport services.

When innovative fourth party logistics arrangements divide responsibilities in new ways and include outsourcing of the finance and ownership flow, the traditionally used laws and standard-form contracts do not always support. Innovative contracts are not always easy to master, and trying to solve problems by using rules from other legal perspectives can make it even more complicated. If many legal roles (buyer, owner and commercial agent) are given to one party in an inconsistent way the legal understanding of the complex of roles might be different from what was intended. Old laws are not always directly applicable to new roles in innovative supply chains (this illustration is reported in more detail in Olander and Norrman, 2012).

5. Discussion of frictions and challenges

5.1 Frictions between action systems

The illustrations in part 4 show how the perception of legal rules impacted chosen logistics solutions in an odd way from what logistics principles would recommend. The illustrations show that logisticians should be careful when trying to understand potential impact, or friction, with fiscal systems, especially for the following logistics action-oriented principles:

Simplify and compress structures: changes in logistics global structures directly impact how and where a company is established and value-adding activities are performed, so there is direct impact on direct and indirect tax. Operational action-oriented fiscal principles of source, territoriality, destination, domicile and rule of origin must be considered to understand whether friction occurs that would lead to different

solutions from logistics and fiscal perspectives. If products and inventory management is simplified e.g. by keeping SKU-number but using many suppliers for a standard component, the rule of origin must be considered.

Postponement: the move of value-adding activities to warehouses (own or run by service providers), shop or home to customers could impact where and how much tax should be paid, the status of establishment and the classification of products. In addition to principles impacted by changes in logistics structures, type of goods should also be considered. Hence, when assembly of sub modules to final products is postponed, there might be friction with fiscal principles making proposed processes less cost-efficient or even impossible to implement.

Modularization: changes in a product's "bill-of-material" could have interrelation with the type of goods. For products being a mix of HW and SW this becomes very clear, but also for pure HW products it could make sense to analyse the customs classes for different components and the final product, and evaluate where final assembly should be done.

Outsource: outsourcing implies less control of where the material and financial flows pass, and if the supplier moves a location of contract partner or manufacturing partner it might have an impact on the company's own flows (e.g. if drop shipment is used). A direct impact on customs and VAT obligation may occur as for simplifying and compressing structures – but a complicating factor is that the more integrated processes are, the more difficult it is for the company to understand what suppliers and sub suppliers are doing and how that impacts the own processes and tax situation. For innovative outsourcing solutions also the contractual set-up can imply frictions, if old conventions not apply.

For these action-oriented principles, the interrelationship with the areas of CIT, VAT (or sales tax), and customs seems most clear. The reason is that logisticians move localization of value-adding activities between different countries or organizations. When that occurs, it has a clear impact upon where the income is located or where transactions occur for tax purposes.

For two of the logistics principles discussed in Section 4, we argue that they do not interrelate or contradict themselves with fiscal principles, but the interrelationships are more indirect:

Speed up and re-distribute lead times: indirectly, the lead time focus might lead to compressed structures, postponement or more integrated processes-but then the interrelation is discussed for those principles.

Simplify administration and transactions: additional administration due to VAT reports, customs handling, requirements of tracking point-of-origin etc. runs counter to this principle.

Hence, how the logistics/SCM principles are operationalized determines their friction with fiscal principles. Considering the results in view of the different levels of belief systems and action systems, Figure 1, it can be concluded that although there may be a difference between the law as practiced and the law as it stands, the frictions found in the illustrations were indeed also present in a comparison of the two domains based on principles. This have illustrated that understanding of the legal and fiscal domain could be needed to implement logistics principles properly without frictions – especially in a global perspective, as laws and regulations often differ between countries. Principles creating frictions between the two domains that were observed in this study are summarized in a conceptual framework, Figure 3. It also summarizes the challenges discussed in next section.

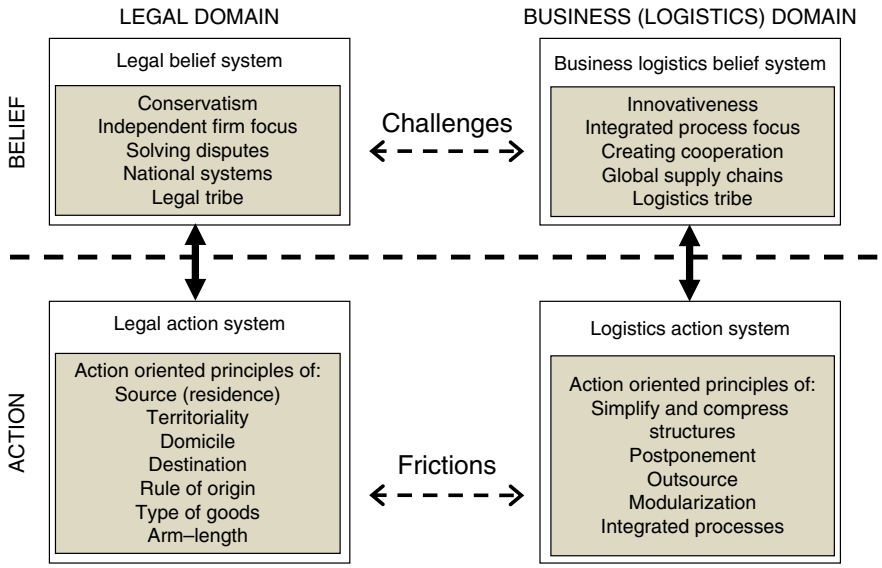

Figure 3.
Examples of differences between the domains creating frictions and challenges

5.2 Challenges between belief systems

Our inventory of frictions raises the question of whether there is a "real" conflict between the fundamental fiscal principles and logistics principles. Or are the frictions found based only on the law as it is practiced, or enacted deviating from the fundamental fiscal principles, leading to the conclusion that the fiscal principles as such are not in conflict with logistics principles? As can be seen, how the logistics principles are operationalized and implemented by the practitioners determines their friction with legal principles. Differences between the domains on the more abstract belief system, which could create challenges, have also been observed.

Conservatism vs innovativeness. As pointed out earlier, there is certain conservatism in law, inherent in a system where results need to be foreseeable and situations and individuals must be treated equally. The legal system should be simple to understand and applicable to everyone. Principles that support this have been discussed above (overriding principle of legal certainty etc.).

In contrast to this are companies' competitive strategies. Innovation is a key driver for creating competitive strengths. For example, for a hypercompetition strategy (D'Aveni, 1994), the idea is to be unpredictable, while a differentiation strategy (Porter, 1980) builds on segmentation and treating different segments differently. Hence the general points of departure are very different, with law looking for stability and equality while business strives for change and differentiation. This fosters different cultures and behaviours. We have also encountered comments pointing up an enigma: while logisticians quite often (are asked to) find a creative solution (such as drop shipment) to an upcoming problem fast without analysing all possible potential pitfalls, this behaviour could create friction with the legal professionals who by nature or training are more averse to risk. When lawyers take a risk, it must be very well understood and analysed. There seems to be a challenge between the legal domain that is conservative by nature, and the logistics domain that has to seek innovative solutions to create competitive advantages.

Focusing on independent firms vs focusing on integrated processes. In the legal domain, the starting point is independent companies, illustrated by perspectives such as:

(1) Business is done between independent firms;

(2) Agreements are between two parties; and

(3) The arms-length principle.

In the logistics domain, the underlying stream has for many years been inter-functional trade-off analysis, flow focus, and principles such as:

(1) Outsourcing;

(2) Integrating processes and increase collaborative behaviour with supply chain partners to synchronize activities; and

(3) Improving information sharing (visibility, connectivity) along the supply chain.

Hence, it is the underlying perspectives on how companies are working and organized that differ between the domains. While logisticians try to move value-adding activities across functions and between companies to create better inter-organizational flows, legal and fiscal practitioners have to be careful with regard to the structuring of legal persons and their businesses. There seems to be a challenge between the legal focus on independent firms, and the logistics focus on integrated inter-organizational processes along supply chains.

Solving disputes vs creating cooperation. One of the fundamental functions of the law is to provide an arena and rules for settling disputes, which is done after they have occurred (*ex post*). Hence regulations and contracts are formulated with this as a starting point, meaning that contracts should be useable in court.

One leading principle of logistics, and particularly SCM, is to integrate processes and increase collaborative behaviour with supply chain partners to make activities synchronized (see part 3.1). As it is usually important for logisticians to create cooperation, the formal contract in itself is not always seen as particularly critical. Sometimes when logisticians put effort into formalizing an agreement, this effort is made before (*ex ante*) to develop routines and processes for how the cooperation should work, and they are not concerned with *ex post* problems of resolving disputes. There seems to be a challenge between the legal domain that is focused on formalizing clear interfaces and solving disputes *ex post*, and the logistics domain that is focused on creating cooperation.

National perspective vs global perspective. Legal systems are in principle national (or (con-)federal), and international complications are broken down to national situations. Different countries treat a similar situation differently (e.g. type of goods classification, custom tariffs) although an international harmonization has begun. The interest of each country is to protect its national tax base and get companies to pay tax whenever domestic law states they have to. Sometimes the free trade between countries is limited. It could be argued that it seems less likely that customs tariffs will be different depending on whether activities are postponed or not, or depending on when and where different modules are put together. In this respect customs' classification rules might need an overview. However, nations normally have reasons for how they are acting, and customs and trade barriers are put in place for the purpose of protecting domestic interests.

International trade is an old phenomenon. However, manufacturing and other value-adding activities are increasingly being moved between countries and continents as trade is globalized. Globalization is a tool not only to increase international sales, but also to create flexible global supply chains where products and services can be produced where most effective. In terms of tax policy, most businesses will not try to maximize the tax payments in a country, but they will try to minimize the total tax payment globally. There seems to be a challenge between the fiscal domain that has a national perspective to protect (primarily) domestic society, and the logistics domain that has a perspective of improving companies' competitiveness in a global environment.

Professions separated by culture, preconceived ideas and paradigms. As shown by our illustrations of friction between principles, as well as different points of departure, there are issues to overcome. There are gaps in knowledge of the other domain, caused, for example, by limits in the education at universities. Logistics students are rarely educated in law or tax issues, while law students are almost never educated in logistics. Hence different "tribes" evolve with different cultures and using different languages. We have also observed anecdotal examples of preconceived ideas of the other domain in practice, such as:

> "If the legal side instead of always telling us No, you cannot do it like that, would have advised us what to do, we would have involved them much earlier" (Senior logistics manager).

The situation is not better, probably worse, in academic research. Getting back to Kuhn's (1962) definition of paradigm, we have, when performing multidisciplinary research, clearly understood our totally different ways of defining and formulating research questions, applying research methods, defining types of data and evidence, arguing for our conclusions etc. In law, by tradition research usually entails establishing the law as it stands, using the traditional sources of law (the text of the law, judgments, preparatory works, scholarly writing) in a particular way. Such research perhaps, but not necessarily, entails putting the law as it stands in one or another perspective (as done in Henkow, 2008). This should be contrasted with logistics research, where empirical data can form the basis for theory building, which is not traditionally the case in legal research. There seems to be a challenge to improve both domains' current and future understanding of each other, and hence decrease the gap between different professional "tribes".

6. Concluding remarks

6.1 Contributions and implications

This research contributes to multidisciplinary logistics research through its focus on law. We have so far seen little interaction in research between the domains of logistics and business law. While publications from consultancies and tax advisors are more normative in what "should be done", and previous research discusses very specific issues (e.g. describing changed contexts such as trade areas), this study increases the joint understanding of the two domains. In comparison to Henkow and Norrman (2011) and Olander and Norrman (2012) this paper has a broader and more reflective scope, analysing the interface from a principle-based point of view.

Our conclusion is that there is a knowledge gap between the domains, and related frictions and challenges, which must be addressed both in the action-oriented system and in a more abstract belief system. Another contribution has been the attempt to

increase mutual knowledge about the other domain's point of departure and action-oriented principles by summarizing them. This could be a starting point for future cross-functional development. The third contribution is the proposed challenges in the abstract belief system that could be illustrated by totally different perspectives on desirable speed of change (conservative vs innovative), state of relationships (disputes vs cooperation), main system to act within (national vs global), and perspective on organization (firm vs process).

Our fourth contribution has been to point out some frictions in the action-oriented system. They have been illustrated by a discussion of action-oriented logistics principles that could create friction with the legal system. Those principles mainly address the logistics structure (simplify and compress structures, modularization), value-adding processes (postponement), and inter-organizational integration (integrate processes and increase collaboration; outsource). The intersection highlighted was mainly with fiscal action-oriented principles such as domicile, source, territoriality, type of goods, rule of origin, destination and arms-length. Importantly, some conflicts are foreseen and intended. For example, when a value-creating activity is moved between jurisdictions, this will have an impact on the tax liabilities of the legal entity to which the activities belong. That is a consequence of dealing with several, sovereign territories.

One implication for practice is that companies in which logistics and legal practitioners combine the understanding of their principles, and jointly redesign global logistics structures and processes, would probably reduce cost, unnecessary flows and legal risks better than if they work in functional silos. Logistics and legal practitioners that have a good understanding of the other domain's principles will also more easily avoid friction with the other domain.

Our advice is that by increasing cooperation practitioners will be able both to avoid making costly solutions, and to develop solutions that build upon combined expertise. One step would be to develop joint policies and guidelines regarding physical and financial flows combined with tax, and to make sure that they are also implemented. Another is to develop regulations and standard contracts that are better aligned to the integrated business models that are developing. To make this happen, we believe both domains have to increase their understanding of, and accept, or reconcile with, the other domain's differing principles, practices and points of departure.

6.2 Limitations and future research

With the study's exploratory and conceptual approach come limitations that could be addressed by future research. The study is limited in scope, and the empirics could be extended by legal areas other than the fiscal, more logistics and supply chain principles, and other studied organizations. On the legal action level this study focused on the fiscal area (taxation, customs). Further research could explore action-oriented principles of contract law, competition law, sales law, and corporate law. Our observations have mainly regarded the interaction between supply chains (or companies) and national and foreign authorities, while legal aspects also can be observed within companies (workers' rights) and between companies (contracts, sales, joint ventures, cooperatives etc.).

The use of convenience sample limits the ability to generalize the findings in this study. This could be improved by turning to more deductive research, such as applying survey-based research to study how common different frictions and challenges

between different combinations of logistics and legal principles and points of departure really are.

Another task could then be to inform society's policymakers about this, and to try to make laws and regulations both coherent and also adapted to development and innovation within logistics and SCM. The practical applicability could increase if future research could develop tools of value for both domains and useable in their interaction, for mapping and modelling the impact of new business models, tax aligned supply chains, or changed regulations.

The different challenges could all lead to further research. The challenge of firm focus vs integration is related to what legal persons are involved and who should pay the tax. Research could investigate the potential and impact of having more "supply chain-oriented" and integrated entities as legal persons. The challenge of national vs global perspective is very visible in the tax area. Currently, the system for taxing cross-border transactions in the EU is under review. The European Commission is looking at alternative methods for levying VAT in cross-border transactions. In the review, the workability of the rules is indeed discussed, but SCM perspectives are absent. Further research on the new proposals suggested in a SCM perspective would be greatly beneficial to the evaluation of the system to come.

On the more action-oriented level, it could be researched what kind of establishment different types of distribution centres (with e.g. consignment stocks, postponed assembly, downloading of SW) have in different countries, and what the impact is on indirect and direct tax. It could be investigated what factors supply chains, with increased servitization and combination of HW and SW, should consider in different countries for optimizing their network. Then decision models for this could be developed. Other issues are what the implications will be of digital logistics and SW supply chains for customs handling and tax, and how similarly or differently countries handle this.

It seems that multidisciplinary research could have more to contribute in the interface between those two domains.

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Appendix

	Combined SCM/logistics principle in action system	Sources discussing SCM/logistics principles					
		La Londe and Mason (1985)	Persson (1995)	Anderson *et al.* (1997)	Abrahamsson (1999)	La Londe (2003)	Kotzab and Otto (2004)
1	Speed up or re-distribute lead times		1. Reduce or redistribute lead times		6. Time to customer		2. Speed up
2	Optimize inventory turnover by e.g. increasing frequencies	6. Inventory velocity	3. Re-distribute or increase frequencies				5. Optimize
3	Reduce, or adopt to, variances and uncertainties	5. Variance reduction	2. Reduce or adopt to the uncertainties				8. Level
4	Understand signals of market demand, and eliminate or adjust to them		4. Eliminate or adopt to expected pattern of demand	3. Listen to signals of market demand and plan accordingly			
5	Segment and differentiate customer service and products	1. Selective risk	6. Differentiate	1. Segment customers based on service needs		4. Leverage	6. Differentiate, Customize
6	Differentiate the logistics network		6. Differentiate	2. Customize the logistics network			
7	Postponement	7. Postponement	7. Postpone	4. Differentiate products closer to customer			9. Postpone
8	Simplify and compress structures		5. Simplify structures, systems and processes		1. Centralized warehousing		1. Compress
9	Modularize products		5. Simplify structures, systems and processes				7. Modularize
10	Simplify administration and transactions	4. Transaction simplification	5. Simplify structures, systems and processes		4. Minimized administration	5. Scalability	8. Level
11	Improve ICT (visibility, connectivity and decision support) along the supply chain	2. Information selectivity 3. Information substitution	8. Improve information processing and decision support system	6. Develop a supply chain wide technology strategy	3. Transparancy, visibility 5. Point of sale information	1. Connectivity	

(*continued*)

Table AI.
Logistics/SCM principles in action system; different authors

	Combined SCM/logistics principle in action system	Sources discussing SCM/logistics principles						
		La Londe and Mason (1985)	Persson (1995)	Anderson *et al.* (1997)	Abrahamsson (1999)	La Londe (2003)	Kotzab and Otto (2004)
12	Integrate processes and increase collaborative behaviour with supply chain partners to make activites synchronized		9. Strengthen the (internal and)external integration	7. Adopt channel-spanning performance measures	3. Transparancy, visibility 9. Integration	2. Collaboration 3. Synchronization	3. Collaborate, co-operate 4. Integrate
13	Source strategically and outsource	8. Share/shifted risk (outsource)		5. Source strategically		4. Leverage	
14	Leverage on economies of scale				2. Advantages of scale		
15	Develop global centres of excellence with process/function expertise		9. Strengthen the internal (and external) integration		7. Separation 8. Specialists should run all main processes 10. Globalization		

Table AI.

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