Managing and mitigating shippers' dyadic risk under INCOTERMS: navigating rough waters

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Abstract

Recent changes to INCOTERMS are reviewed. Graphical illustrations are utilized to identify critical points of risk and cost curves' dyadic transfer. Impact to shippers' supply chains and risk mitigation and management strategies are illustrated. Gaps in theory and practice are identified and potential theoretical underpinnings are proffered for future research.

Keywords: Risk mitigation, shipping strategies, Incoterms

Introduction

International Commercial Trade Terms, contemporarily known as Incoterms, are a series of standards defining risk and cost between consignees and consignors (i.e., shippers or transactors) of the world's containerized freight shipments. The terms evolve to better reflect commercial trade practice and policies, and are updated periodically-roughly every ten years. The most recent revision reduced the terms from 13 to 11. The terms run a spectrum of risk and cost responsibility from EXW (meaning the seller has minimal risk and the buyer has maximum risk to DDP, where the seller carries maximum risk and the buyer the least.

This research project is grounded in Transaction Cost Economics theory and is intended to be generalizable to the management of risk and the mitigating or reduction of risk at the firm, or organizational level. Based on the core tenets of Transaction Cost theory – asset specificity, uncertainty, bounded rationality, opportunism and transaction frequency-the authors ultimately intend to create an expert system via structural equations modeling as a tool to aid in decision-making and risk management for shippers (consignees and consignors) of freight, particularly transactions between organizations distant from one another using the world's ocean trade lanes. This paper lays the foundation for the expert system.

This narrative is divided into two sections. First, each of the 11 Incoterms is defined and the latest revisions reviewed. Second, Transaction Cost Economics is introduced as an appropriate theory in which to ground decision-making and risk mitigation for transactors of international freight shipments. The authors introduce the idea of creating an expert system grounded in Transaction Cost theory, where varying levels of the core tenets of the theory will aid the firm in decision-making and risk management to match levels of risk taking and risk aversion with appropriate INCOTERMS shipping strategies.

Recent Updates to INCOTERMS

On January 1, 2011, the International Chambers of Commerce (ICC)'s Incoterms 2010 took effect. These were the seventh major revision of the Incoterm Rules and the first revision since 2000. The new rules have been revised and updated to take into account: a) developments in international trade over the past decade as the volume and complexity of global sales and trade have increased; b) to address security issues arising in recent times; and, c) to provide for ongoing changes and evolutions in electronic communication and commerce. Furthermore, the new rules also take into account the growth of customs-free trade areas.

Origins of INCOTERMS

Incoterms, an acronym for International Commercial Terms, were first developed in 1936 by the Paris-based International Chambers of Commerce (ICC) as a set of international rules for the interpretation of trade terms (Barelier 1995), and have been revised periodically to best reflect current international trade practices (Stapleton and Saulnier 1999). INCOTERMS have undergone substantial changes in 1953, 1967, 1976, 1980, 1990, 2000, and most recently in 2010, taking effect in late 2011. Below is a list comparing Incoterms 2000 with the new Incoterms 2010

Figure 1

Incoterms 2000 and Incoterms 2010

Incoterms 2000	**Incoterms 2010**
EXW [Ex Works]	EXW [Ex Works]
FCA [Free Carrier (..at named place]	FCA [Free Carrier (..at named place]
FAS [Free Alongside Ship]	FAS [Free Alongside Ship]
FOB [Free On Board]	FOB [Free On Board]
CFR [Cost and Freight]	CFR [Cost and Freight]
CIF [Cost, Insurance, & Freight]	CIF [Cost, Insurance, & Freight]
CPT [Carriage Paid To]	CPT [Carriage Paid To]
CIP [Carriage & Insurance Paid to}	CIP [Carriage & Insurance Paid to}
DAF [Delivered At Frontier]	DAP [Delivered At Place]
DES [Delivered Ex Ship]	DAT [Delivered At Terminal]
DEQ [Delivered Ex Quay – Duty Paid]	DDP [Delivered Duty Paid]
DDU [Delivered Duty Unpaid]	
DDP [Delivered Duty Paid]	

Incoterms 2000 were presented by the ICC in Four Groups: E, F, C, and D. Incoterms 2010 are compressed and now presented in two groups. The new classification makes it easier for shippers to discern between incoterms that are to be used only for inland waterway or sea and those that can be used for either inland waterway/sea or multi-modal contracts (i.e., intermodal transportation transactions).

Figure 2

Two Classifications under Incoterms 2010

Used for any mode or multi-modal Transport
EXW
FCA
CPT
CIP
DAT
DDP
Used only for Sea and Inland Waterways
FAS
FOB
CFR
CIF

Reclassification of Rules

The new Incoterms, or rules are separated into two classes: 1) Rules for use in relation to any mode or modes of transport, which can be used where there is no maritime transport at all, or for transportation transactions in which maritime transport is used for only part of the carriage (i.e., intermodal maritime); and, 2) Rules for Sea and Inland waterway transport, where the point of delivery and the place from which the goods are carried to the buyer are both ports. FAS, FOB, CFR, and CIF belong to the second class of rules. In Incoterms 2000, there was a demarcation at the "ship's rail." That is, the ship's rail was the "critical point," the point at which risk and obligation shifted from the seller to the buyer. In Incoterms 2010, the reference to the "ship's rail" has been deleted. With respect to FOB, CFR, and CIF, the critical point is now considered to take place with the goods being delivered when they are "on board" the vessel. Finally, the new rules now apply to both domestic and international trade. Traditionally, Incoterms have only been used for international trade. However, recent developments in international trade, such as evolutions in the European Union and other trading blocs, negate or minimize the significance of border formalities. The new rules now recognize that they can also be used for domestic sale contracts and reference is now made in a number of rules that export and import formalities will only need to be complied with when and where applicable. It was anticipated that this change may encourage greater use of the Incoterms 2010 in the USA in place of the former US Uniform Commercial Code. Anecdotal evidence suggests this is the case as early as third quarter 2012.

Figure 3

Two New Terms Replace Four Old Terms

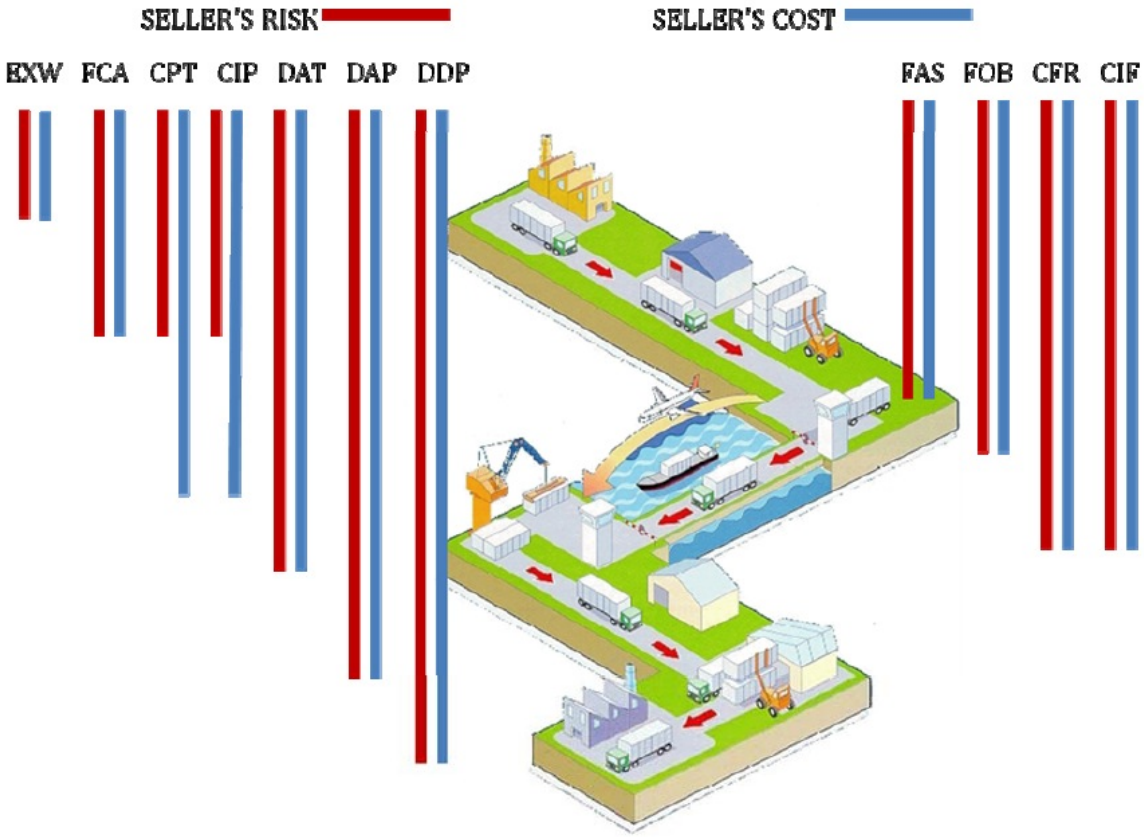
New Term	Replaces Old Term(s)
DAT [Delivered at Terminal]	DEQ [Delivered ex Quay]
DAP [Delivered at Place]	DAF [Delivered at Frontier]
	DES [Delivered Ex Ship]
	DEQ [Delivered Ex Quay]
	DDU [Delivered Duty Unpaid]

DAT [Delivered At Terminal] replaces DEQ [Delivered Ex Quay]. DAT may be used irrespective of mode of transport selected and may also be used where more than one mode of transport is employed (e.g., intermodal transport). Delivered At terminal means that the seller delivers when the goods, having been unloaded from the arriving means of transport, are placed at the buyer's disposal at a named terminal at a named port or place of destination. DAT requires the seller to clear the goods for export where applicable but the seller has no obligation to clear the goods for import duty nor carry out any import customs formalities. It was considered that DAT would be more useful than DEQ in the case of containers that might be unloaded and then loaded into a container stack at the terminal awaiting shipment. Under Incoterms 2000 (and before), there was previously no term clearly dealing with containers that were not at the buyer's premises. DAP (Delivered At Place) replaces DAF, DES, DEQ, and DDU. Now, the arriving "vehicle" under DAP could be a ship and the named place of destination could be a port. Consequently, the ICC considered that DAP could safely be used instead of DES and that it would make the rules more user friendly if they abolished terms that were fundamentally the same. A seller under DAP bears all of the costs (other than the import clearance costs) and risks of bringing the goods to the named port of destination.

See Figure 4 for as graphical depiction of all 11 Incoterms 2010 in a single snapshot. Note that in each, the critical points are indicated where the seller's risk curves (in red) end and where the seller's cost curves (in blue) end. That is, at these "Critical points" the cost and/or risk shifts from the seller to the buyer. In most, but not all, the critical points are at the same point. Also, see Figures 5 (Ex Works) and 6 (Free on Board) for graphical depictions of these two Incoterms specifically. Ex Works represents the Incoterm in which the seller has the least responsibility and conversely the buyer has the most. In Figure 5 (and 6) the Seller's curves are represented in red and the buyer's in blue. When and where these shift from seller to buyer are the critical points. Free on Board is presented because it represents the most commonly used Incoterm as roughly 95% of all containerized cargo is transacted under this Incoterm globally on an annual basis. (Only two of the 11 Incoterms 2010 are depicted in this document due to space considerations. For a complete graphical representations of all Incoterms, please contact the lead author at the above e-mail address).

Figure 4

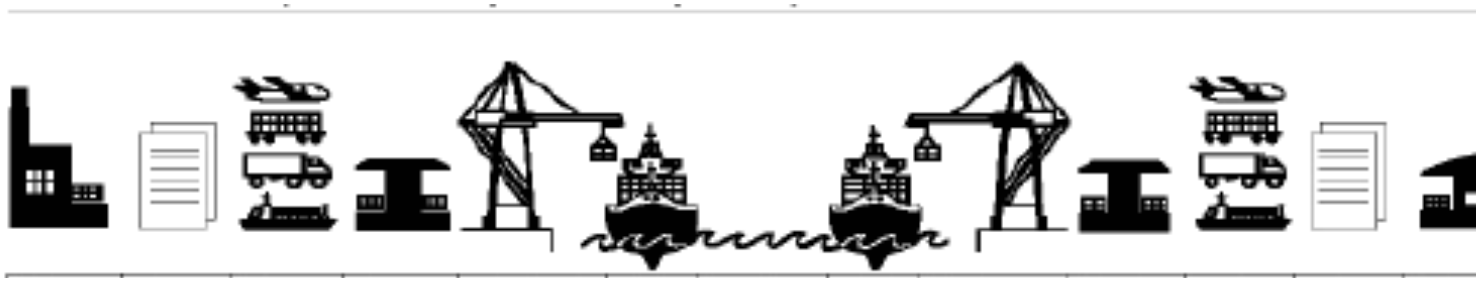
Critical points for all 11 Incoterms 2010



Source: MIQ logistics

Figure 5

EXW: Ex-Works: The Seller's only responsibility is to make the goods available at the Seller's premises. The Buyer bears full costs and risks of moving the goods from there to
destination.



EXW- Ex Works
Seller

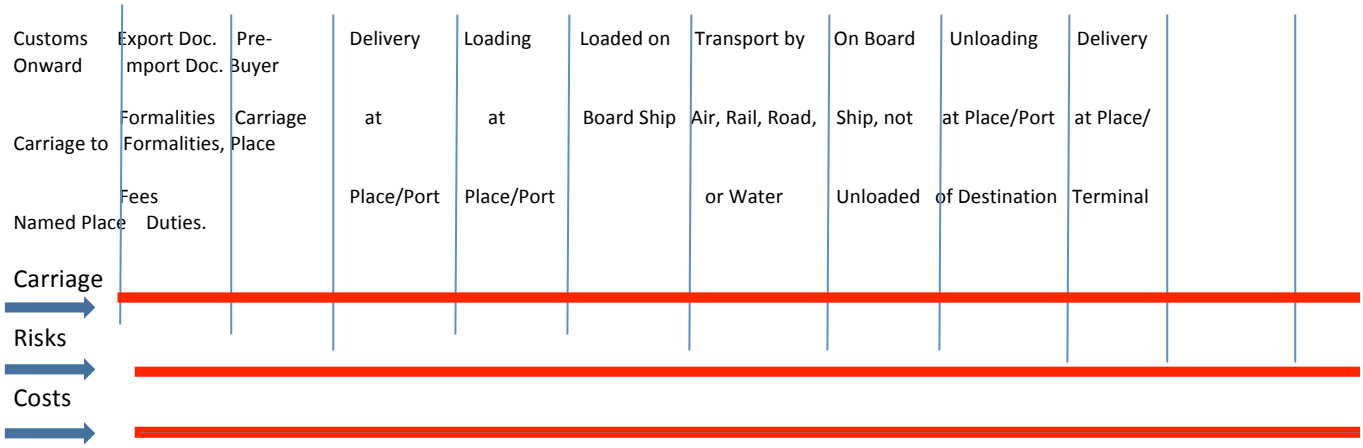
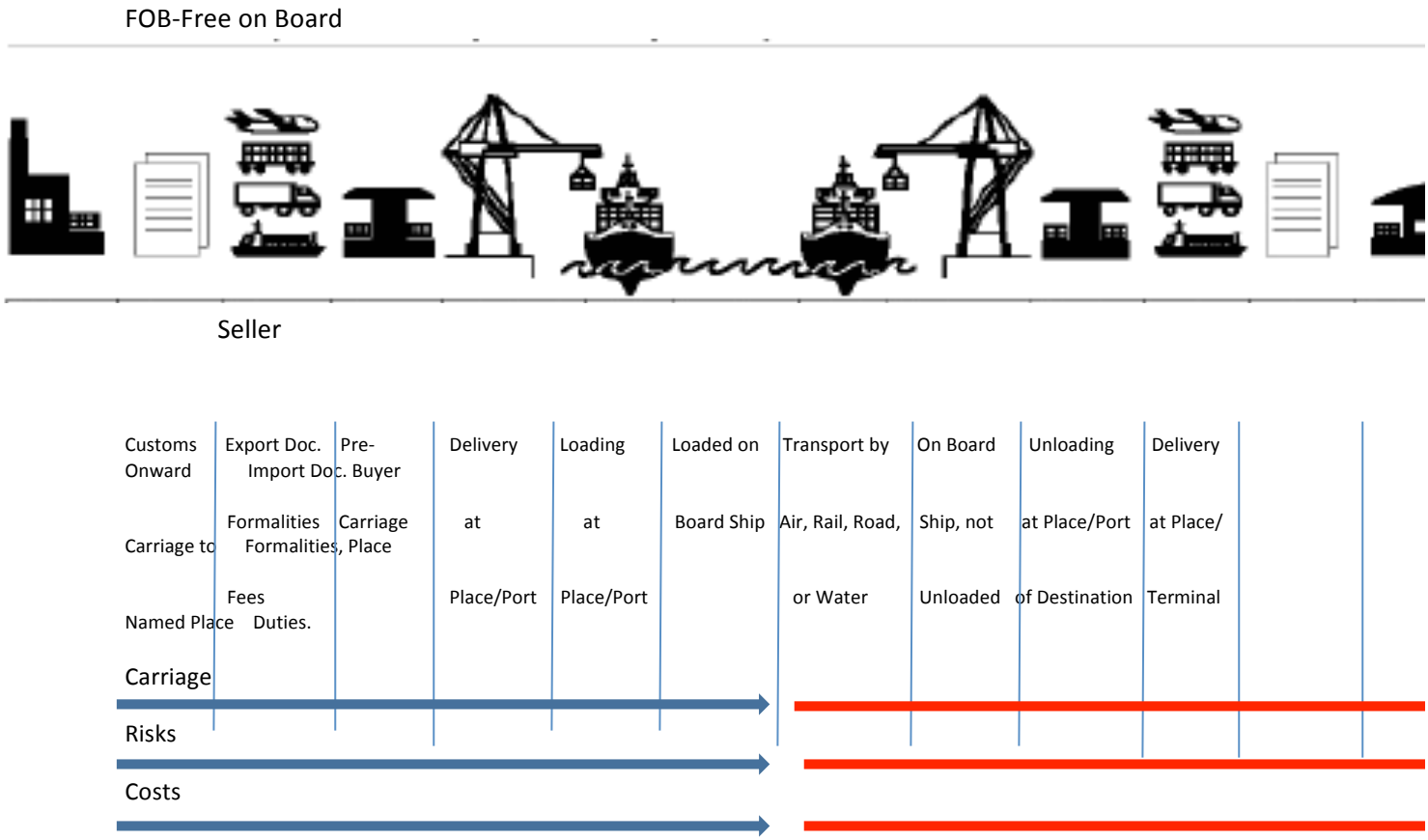


Figure 6

FOB: Free On Board: The Seller delivers the goods on board the ship and clears the goods for export. From that point, the Buyer bears all costs and risks of loss or damage.

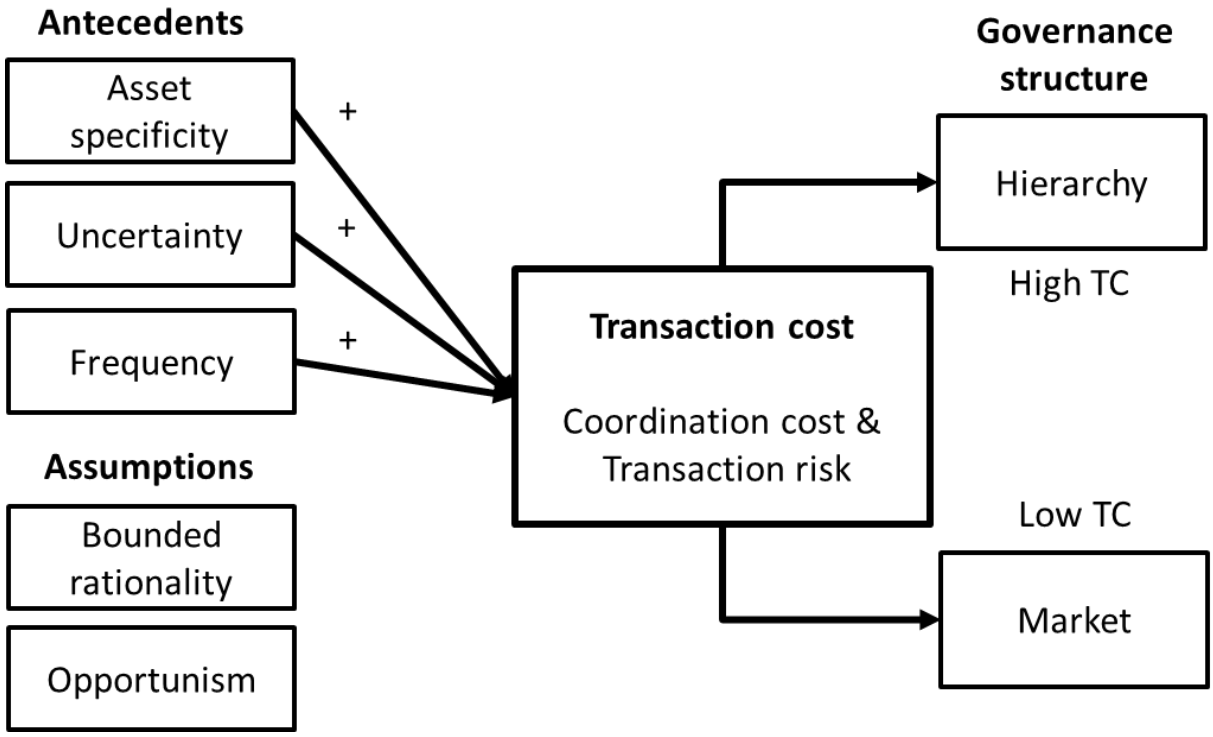


Transaction Cost Economics Theory

Transaction cost economics theory has received a lot of empirical support in explaining governance structures. As evidenced in the above discussion, the INCOTERM framework is essentially a governance structure as it represents risk and cost responsibilities along a continuum. Transaction Cost Economics, developed primarily by economist Oliver Williamson (1975, 1979, 1981, 1985) focuses on firm-level decision-making determining how various functions are more efficiently performed. Williamson's formulation suggests that five tenets are crucial in yielding clear causal relationships

between transactional characteristics and governance arrangements. Figure 7 illustrates the transaction cost theory. The left side of the figure shows the TCE's three main antecedents: (1) asset specificity, (2) uncertainty and (3) frequency of the transaction; and two assumptions: (4) bounded rationality and (5) opportunism; while the right shows the transaction cost and its potential governance structure. This theory proposes that transaction cost consists of coordination cost and transaction risk that determines the potential governance structure. As the transaction cost increases hierarchy seems to be the appropriate structure while at low cost market seems to be the appropriate one. The transaction cost is primarily increased by three antecedents; while the impact of these antecedents is dependent on the two assumptions. We formulate the 11 Incoterms as a cost/risk continuum, anchored by the least risk and cost for the seller (i.e., greatest cost and risk for the buyer) in Ex Works to the greatest risk and cost for the seller (and least for the buyer) in DDP.

Figure 7 TCE



We argue that these antecedents and assumptions of TCE should be considered in determining the appropriate Incoterm strategy vis-à-vis a firm's strategic quests for managing and mitigating risk. One of these antecedents is asset specificity. It refers to the transferability of assets that support a given transaction. Highly asset-specific investments represent costs that have little or no value outside the exchange relationship. Producers of a unique product usually use unique assets. Having the ability to produce a unique product and having unique assets can be risky for a seller, because this may require making an investment that may not be useful to produce other products. This

uniqueness of assets and products may make the product more valuable; however, it can also make it harder to find a buyer. Thus, a seller may want to develop a long-term relationship with the buyer. In addition, the seller of a unique product should make sure the service is well provided to the buyer.

Another factor that increases transaction cost is uncertainty. Uncertainty refers to the unanticipated changes in circumstances surrounding a transaction. There are many forms of uncertainty that may affect the transaction, both internal and external. The seller may want to sell a product to a buyer in a less stable part the world. In this transportation transaction, the seller has to be cautious about where to finalize the shipment; such that the seller may not want to deliver the product to the door as the uncertainties of this transportation in an instable environment may be high. Even though the product can be unique, because of the instability in another country this may lead the seller to choose Incoterms that may allow taking on less risk and cost. On the other hand, a seller that sells the product to a buyer at a more stable destination country may be more likely to take on the cost and risks. As a result, when selling a product to a buyer located in an unstable environment, the point that the risks and costs rise significantly higher can be considered when strategizing the appropriate term.

Frequency of transactions can also to be considered in the decision of choosing appropriate shipping strategies. As the frequency of transaction increases more risks and coordination costs are incurred. So a seller who sells a product frequently to a buyer may want to develop a strong relationship to reduce these risks and costs. While sellers' delivery to the door policy can show the commitment to develop strong relationships, in the long run this could be costly. For instance, a seller in a foreign country can have higher level of cost and risk as they deliver to the door of the buyer. This type of frequent transactions may require joint planning to decide how to minimize the total cost and risk for the seller and buyer. In addition, while joint planning may increase the transaction cost, it allows for the development of commitment. As a result, the transactions, though frequent, may require choosing the term that minimizes the total cost for buyer and seller.

One of the assumptions of TCE is bounded rationality. Bounded rationality refers to the neurophysiological limitations of individuals. That is, TCE assumes transactors are rational, but only limitedly so. In an organizational context, while managers need to act rationally, they are limited in their ability to process information without error. This limitation results in making it difficult to completely specify the conditions surrounding an exchange. Thus, the knowledge of the seller firm regarding the transportation process and the buyer has to be considered when choosing the appropriate Incoterm. This knowledge may counteract the uncertainty. For example, while a buyer can be located at an instable part of the world, the seller's specific knowledge can reduce the uncertainty and allow them to deliver the product to the door of the buyer. The seller without country-level or specific knowledge may prefer choosing a term that reduces uncertainty and risk. However, the seller may offer a higher variety of terms to the buyer and gain advantage in the transaction as their knowledge mitigates uncertainty.

Another factor in transaction cost theory is opportunism that refers to the fact that exchange partners may cheat, lie and try to violate the agreement to get a higher level of benefits. This factor may result in increased effort, and resultant costs, to monitor

transaction partner actions. This assumption is also related to the knowledge of the seller's firm, the knowledge of buyer's firm about the environment and its culture may allow them to recognize opportunistic actions. For example, when a seller is aware of the legal environment of a country, they are more likely to recognize the opportunistic actions. So knowledge is the critical factor to choosing the appropriate terms and gives flexibility in seller's decision-making.

Conclusion

These five tenets are hypothesized to impact the seller-buyer dyadic transaction relationship and inform the parties to the best Incoterm shipping strategy. The strategy is also likely very dynamic and the ES model will be designed to inform the appropriate usage of Incoterms as conditions dictate. For example, as levels of the five tenets change (e.g., increased uncertainty, decreased frequency, increased levels of asset specific investments), the shipping strategy may change as well to best reflect the risk-mitigating and decision-making strategies and propensities of the transacting partners. Future research is encouraged to determine whether TCE is an appropriate theory upon which to base an expert system normative model for Incoterm shipping strategy development.

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