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Document Version

Final published version

Published in:

Journal of Supply Chain Management

DOI:

[10.1111/jscm.12278](https://doi.org/10.1111/jscm.12278)

Publication date:

2022

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Citation for published version (APA):

Sternberg, H., Linan, I., Prockl, G., & Norrman, A. (2022). Tragedy of the Facilitated Commons: A Multiple Case Study of Failure in Systematic Horizontal Logistics Collaborations. *Journal of Supply Chain Management*, 58(4), 30-57. <https://doi.org/10.1111/jscm.12278>

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Tragedy of the facilitated commons: A multiple-case study of failure in systematic horizontal logistics collaboration

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Abstract

Horizontal logistics collaboration can increase environmental sustainability and reduce shipping costs. Given these benefits—and the fact that few shippers actually opt to collaborate—public sector agencies and industry associations have attempted to sponsor and support the facilitation of horizontal logistics collaboration projects over the past 20 years. The literature, however, has yet to reveal the fact that these efforts have largely failed. Here, we introduce *systematic horizontal logistics collaboration* and apply Ostrom's theory of the commons and agency theory to extract antecedents on why these projects failed. We present a multiple-case study on unsuccessful horizontal logistics collaboration projects in Great Britain, Germany, Sweden, and Denmark. We address a gap in supply chain literature with regard to systematic collaboration; we also demonstrate the utility of commons theory in the supply chain domain and contribute to the literature on supply chain collaboration with facilitators. Finally, we discuss managerial implications, both for the practitioners attempting systematic horizontal logistics collaboration and for the policymakers seeking to promote it.

KEYWORDS

collaboration failure, multiple-case study, outside facilitation, systematic horizontal logistics collaboration, theory of the commons

INTRODUCTION

This is all very often typical—that you report the success, but when something is not a real success, there is very little investigation. You sit back on finding the reasons for that.

The sponsor of a horizontal logistics collaboration project

For any project, discussing success is always a more enticing prospect than dissecting failure. However, when failures are pervasive—as is the case with many horizontal logistics collaboration (HLC) projects—such an investigation is not only advisable, but essential. HLC focuses on “identifying and exploiting win-win situations among companies that are active at the same level of the supply chain in order to increase performance” (Crujssen, Dullaert, & Fleuren, 2007, p. 23). In the past 5 years

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alone, sponsors—including European government agencies and industry associations—have spent tens of millions of euros pushing for HLC. In its 2018 N2018/04484/Ts decree, for example, the Swedish government tasked its Transport Administration with developing proposals for HLC systems, including how such systems should be organized and managed.

Both academic reports (Frisk et al., 2010; Jepsen, 2014; Vanovermeire et al., 2014) and practitioner reports (Crujssens, 2012; Saenz et al., 2017) consider an *outside facilitator*—that is, a facilitator who is neither a shipper nor part of the supply chain—to be a key factor in identifying potential collaborators, calculating the opportunity, convincing participants to join, and reducing potential showstoppers. Despite these reports, however, our observations suggest that many of these collaboration projects that use outside facilitators actually fail. Given the significant public sector and industry investment (e.g., ALICE, 2021), such dismal outcomes warrant further investigation in the context of “change from the outside” (Dhanorkar et al., 2018), which adds a new layer of complexity compared with traditional dyadic collaboration (Choi et al., 2001).

Systematic horizontal logistics collaboration

Shipper HLCs—that is, having shippers pool resources and bundle flows—are typically formed spontaneously through personal relationships between the shippers rather than as an effort orchestrated from the outside (McKinnon, 2018). However, over the past two decades, sponsors outside the supply chain, such as public sector agencies and industry associations, have been pushing supply chain members to adopt HLC by sponsoring systematic HLC (SHLC) projects. *Systematic* here refers to using a procedure—and often an advanced tool—to jointly optimize shippers’ pooled transport assets, orders, and information with the goal of achieving a long-term multishipper collaboration (McKinnon, 2018). We therefore define SHLC as *an initiative in which a sponsor sets out to facilitate and systematically organize an HLC project with multiple shippers*. In essence, SHLC is intended to facilitate a structure that lets shippers collaborate with each other (Crujssens, 2020), without involving the logistics service providers (LSPs) or shippers’ associations that build their businesses around bundling shipper transportation.

In a typical SHLC project, the sponsor expects the facilitator (sometimes referred to as trustee or orchestrator) (Crujssens, 2020) to play the key role as a “collaboration matchmaker”—that is, to contact shippers, collect

data on their transports, run an advanced model to identify potential collaboration opportunities, and, finally, to help the shippers turn the collaboration opportunities into an SHLC implementation (see, e.g., Holmberg et al., 2014, pp. 3–6, for a detailed description of a typical SHLC data collection). We academics perceive ourselves as important to progress, and we have frequently stated that facilitators from outside of the supply chain (e.g., consultants or researchers) are favorable or even necessary for reaching horizontal collaboration beyond dyads (Crujssens, 2012; Crujssens, 2020; Frisk et al., 2010; Jepsen, 2014; Vanovermeire et al., 2014), despite the lack of successful SHLC implementations.

Although the United States has as yet shown only limited interest in SHLC, Europe’s attention to the approach has only intensified. For example, the Netherlands alone has financed 70 Cross Chain Control Center projects on pooling and integration (Crujssens, 2020). Supporting Information (Supplement A) outlines SHLC development in the European Union (EU) and the United States.

Existing literature includes SHLC-related concepts such as *supply chain pooling*, *resource pooling*, and the broader *HLC* term, yet it does not differentiate between the spontaneous approach and a systematic approach involving an outside sponsor and an outside facilitation. Indeed, existing research focuses mainly on mathematical and/or simulation models of potential gains (e.g., Crujssens, Bräysy, et al., 2007; Frisk et al., 2010; Pan et al., 2013) rather than on the actual supply chain implementation of the promising—but highly complex—SHLC. Although ample research has investigated traditional supply chain collaboration (Daugherty, 2011; Ralston et al., 2017), few researchers address supply chain partnerships with the public sector (e.g., McCarter & Kamal, 2013) or outside facilitation in supply chains (Quarshie & Leuschner, 2020). In particular, collaborations in which sponsors outside of the supply chain use a proxy—that is, a facilitator that orchestrates the supply chain collaboration—is an overlooked area. Because SHLCs tend to fail, and because learning from failures is important to future success (Burgess, 1989; De Keyser et al., 2019), we set out to address this knowledge gap by investigating the following research question:

Why do sponsors, facilitators, and shippers fail in [systematic] HLC?

We focus on the inner workings of projects that aimed to change Supply Chain Management (SCM) practices “from the outside” (Dhanorkar et al., 2018; Nguyen & Kim, 2019), emphasizing the role of the SHLC project facilitators and the *systematic* approach to shipper logistics collaboration (mainly in land-based transportation). Using our unique multinational dataset, which

encompasses 20 years of pioneering SHLC projects, we provide key insights and propose *SHLC* as a formal construct.

Our empirical contribution is that we investigate, analyze, and provide insights into SHLC failure. We challenge the existing HLC literature on the value and necessity of the outside facilitator (Crujssen, 2012; 2020; Frisk et al., 2010; Jepsen, 2014; Vanovermeire et al., 2014), as our data did not show any evidence of outside facilitators being successful in enabling or sustaining collaboration. Our research sets the stage for future SHLC research, which is an important area for supply chain policy and strategy in many countries (Crujssen, 2020; McKinnon, 2018).

This research makes three main contributions to theory. First, we provide implications of Ostrom's (1990, 2010) polycentric tenets in terms of how they apply to supply chain collaboration and complement the SCM domain's wide use of agency theory. Our in-depth case study highlights the complexity and decoupling that manifest among shippers with outside facilitation. Among the barriers to success in this context are shippers that are unsuitable for collaboration, a lack of self-determination, and a lack of convincing benefits. Second, we explore the complex agency relationships between sponsors, facilitators, and shippers. We identify three main agency problems in SHLC: adverse selection of facilitators and shippers, goal conflicts, and lack of control mechanisms. Third, we contribute to HLC theory (Crujssen, 2020; Crujssen, Cools, & Dullaert, 2007; Ferrel et al., 2019), which has previously focused mainly on operations research (Gansterer & Hartl, 2018) or conceptual research (Pomponi et al., 2015). Our contribution establishes the concept of *SHLC* and provides antecedents for future research. Our multiple-case study shows that SHLC projects are significantly different in setting and complexity than HLC projects (Crujssen, Dullaert, & Fleuren, 2007). We now outline the tenets of commons theory and agency theory, and how each relates to SHLC.

THEORETICAL FOUNDATION

To investigate why SHLC fail, we combine two complementing theories: Ostrom's work on commons theory (Ostrom, 1990, 2010; Poteete et al., 2010) and agency theory (Eisenhardt, 1989a; Fayezi et al., 2012; Jensen & Meckling, 1976; Klerkx & Leeuwis, 2008; Wilhelm et al., 2016; Zsidisin & Smith, 2005). Here, we start by explaining the tenets of commons theory, and then describe how we complement it with agency theory.

Commons theory

The term *commons* refers to shared or pooled resources, such as fish banks or forests, that create a finite flow of benefits and for which it is costly to exclude beneficiaries (Ostrom, 1990). Pooling resources is challenging due to the opportunistic behavior of individuals and the challenges of maintaining visibility and transparency. In the seminal article, "Tragedy of the Commons," Hardin proposed that the commons will not be sustainable without central governance (Hardin, 1968).

Ostrom, however, challenged Hardin's propositions. After studying multiple cases, Ostrom and her collaborators found that certain commons were able to create self-emerging governance structures that led to sustainable use and management of the pooled resources (Poteete et al., 2010). Their work on common-pool resources management (often loosely referred to as the "commons theory") gained widespread recognition and has been adopted in several fields, including tourism (e.g., Heenehan et al., 2015), public management (e.g., Tang et al., 2014), and management information systems (Mindel et al., 2018). According to Ostrom (2000), outside facilitation will often prevent endogenous cooperative behavior, thus preventing sustainable pooling.

Ostrom (2000) suggests that the worst-case scenario is when outside parties impose rules but then achieve only weak control and enforcement of those rules. With strong outside control and enforcement, cooperation is enforced without any need for internal norms to develop. In a scenario lacking rules or monitoring, norms can evolve to support cooperation. In a middle ground state, however, a mild level of outside control discourages the formation of social norms, while also making it possible for some participants to deceive and defect with a relatively low risk of consequences.

Given SHLC's challenges of empowering members to collaborate and commons theory's widespread applicability to research domains addressing the management of pooled resources, we assess the commons as part of our study's theoretical frame.

Tenets of polycentrism

To avoid a "tragedy of the commons" without implementing a strong central authority, Ostrom prescribed "polycentric governance" (Poteete et al., 2010). This complex form of governance of pooled resources has multiple centers of semiautonomous decision-making. As Table 1 shows, Ostrom outlined eight tenets of successful polycentric governance.

TABLE 1 Tenets of polycentrism

Tenet	Explanation
1. Clearly defined boundaries	These boundaries define who the members are and offer a clear description of the common-pool resources.
2. Proportional equivalence between benefits and costs	Members must contribute to the common-pool resources in order to benefit from it.
3. Collective choice arrangements	Such arrangements specify which members are included and how they are allowed to participate in the decision-making process.
4. Monitoring	Monitoring facilitates the detection of selfish behavior.
5. Graduated sanctions	A small rule infraction is sufficiently warned rather than unrealistically sanctioned to ensure longer term compliance.
6. Fast and fair conflict-resolution mechanisms	Mechanisms should be cost efficient and easily accessible to resolve conflict. Less necessary when participants know each other.
7. Nested enterprise	In the case of larger pooling of resources, organization occurs in multiple layers of nested enterprises with small local pooling at the base level.
8. Self-determination	Decisions of the commons are recognized by higher level authorities—that is, there is an appropriate relationship with other tiers of rule-making authority.

We applied the commons theory because it offers a descriptive and normative framework that applies to resource pooling among multiple actors in a supply chain context. Commons theory provides a framework to understand project failures. However, we needed to complement commons with a theory that would help us explain how the outside sponsor and facilitator affected the collaboration between the shippers. Agency theory helps explain behaviors involving principal and agent, self-interest, lack of trust, goal conflict, and imperfect policy implementation (Fayezi et al., 2012).

Agency theory in research and development

In this study, we focus on projects in which sponsors initiate the project and/or fund an outside facilitator to change the supply chains of participating shippers. When dealing with this general type of relationship—that is, the (contractual) arrangement of output-financing in a competitive or noncompetitive grant—we use *agency theory* to describe and analyze the relationships involved (Klerkx & Leeuwis, 2008; Mitnick, 1975). We chose this theory because it is the dominant one that researchers use to study relationships among actors in a principal delegation setting (Braun & Guston, 2003).

Agency theory's basic premise is that if both parties in a principal-agent relationship seek to maximize the

utility function, the agent will not always act in the principal's best interest. In general, this problem involves issues such as information and incentive schemes in delegation. However, agency problems exist in any collaboration, even ones that lack a clear-cut principal-agent relationship (Jensen & Meckling, 1976, p. 309); indeed, agency theory is most relevant in projects with multiple parties, where evaluating behaviors is difficult (Eisenhardt, 1989a, p. 71). We therefore apply agency theory here to cover the relationships within and among our three SHLC participant categories: sponsors (the principals), facilitators (agents of the sponsors), and shippers (agents of the sponsors that are typically selected by the facilitators). That one agent (the facilitator) often selects several or all of the other agents (the shippers) increase the complexity and the agency in the studied context.

Based on agency theory's underlying assumptions, we outline three main SHLC problems (Eisenhardt, 1989a; Rasmussen & Gulbrandsen, 2012): goal conflicts, adverse selection, and moral hazard.

Goal conflicts occur when the goals of the principal (the sponsor) and the agents—that is, the facilitator (such as researchers) and the shippers—either conflict or only partly overlap. Generally, sponsors want to drive change in supply chains. As for the agents, facilitators typically want autonomy to pursue interesting scientific problems or personal financial gain (Hutt, 2008), whereas shippers may want subsidized consulting services and the opportunity to evaluate new ideas. However, shippers are also pressed for short-term gains and are thus typically

reluctant to take risks to implement new practices that have uncertain returns (Sheffi, 2018). Theory suggests incentive alignment through contracts between principals and agents that incentivize the desired behavior (Eisenhardt, 1989a; Whipple & Roh, 2010).

The second problem is *adverse selection*, which refers to the problem of finding the appropriate agents for delegation and the misrepresentation of agent's abilities that result in their selection (Eisenhardt, 1989a). Given SHLC's relative novelty, it is challenging for the principal to properly assess potential facilitators and resource poolers (collaborating shippers). Some facilitators (such as researchers) lack the business experience and commercial skills to appreciate shippers' practical needs, whereas shippers may lack the necessary data and capabilities to actually contribute to SHLC implementation. Furthermore, the shippers' environment may not be conducive to collaboration due to limited trust or low interest.

Finally, the *moral hazard* problem recognizes that agents act out of self-interest, which may not always align with project goals. For example, agents might not put forth the agreed-upon effort (Eisenhardt, 1989a). Or they might participate in projects only at the ceremonial level simply because a principal expects it (Meyer & Rowan, 1977) and thus decouple their practice from the adopted and/or agreed on policy (Wilhelm et al., 2016). Moral hazards also cover changes in agent priorities.

To remedy adverse selection and moral hazard, agency theory suggests regulating agent behavior using three different *control mechanisms*: input controls, output controls, and behavior controls (Eisenhardt, 1989a; Ouchi, 1979; Snell, 1992). Input controls facilitate agent selection, development, and socialization (Snell, 1992). For example, practices such as rigorous staffing and training, and promoting shared values and beliefs may help in acquiring and retaining those agents most appropriate for project success. Output controls focus on directing agent performance: The principal establishes specific goals for the agent, and lets the agent decide how to achieve them (Ouchi, 1979). In contrast, the focus of behavior controls is on directing how the agent carries out the activities aimed at meeting project goals (Ouchi, 1979). Often these controls are manifested by contracts that promote the desired behavior and align the incentives of the principal and the agent (Eisenhardt, 1989a).

Agency theory has been frequently used to study failures in delegation (Braun & Guston, 2003; Eisenhardt, 1989a), and it complements Ostrom's theory on why and how the principals (the sponsors) failed. Further, as we describe in the sections that follow, agency theory helps to enlighten the Hardin–Ostrom debate on the possibility of polycentric collaborations.

MULTIPLE-CASE STUDY

Existing literature promotes SHLC but does not provide an empirically and theoretically grounded explanation of why SHLC fail. Hence, we employ the multiple-case study method. Our method is based on the critical case rationale (Yin, 2018) of studying cases that were sponsored and facilitated by actors outside of the shipping organizations, and according to Eisenhardt (1989b) and Ketokivi and Choi (2014), case studies are well suited for elaborating theory. We elaborate on the Agency and Commons theories.

The starting point of this research was personal experience: Of the four authors, two of us were facilitators in two of the SHLC projects studied that never achieved implementation. Our personal involvement in the cases as well as how any potential bias was addressed is outlined in the within-case analysis. Motivated by our empirical observation of our own and others' SHLC experiences, we developed a structured interview guide (Appendix A). As part of our theory elaboration, we set out to reconcile theory with empirical evidence (Ketokivi & Choi, 2014). This led to a gradual process of combining commons theory and agency theory into our condensed frame.

Case selection: replication logic

Elaborating on the commons theory in new contexts typically starts with small-*n* qualitative studies (Poteete et al., 2010, p. 12). We selected retrospective SHLC cases involving an outside sponsor and an outside facilitator with whom we share a common language. Given our selection criteria (SHLC), we excluded any projects that showcased spontaneous HLC implementations that were initiated or facilitated by the shippers themselves or that involved only simple dyadic collaboration. Some cases were excluded as the author team did not speak the language of the project participants (e.g., Flemish). Also, for an early 90s German case, we were unable to locate the facilitator and therefore subsequently dropped the project from our list of prospective cases. Finally, we excluded several EU projects because they are ongoing and their outcome is therefore uncertain.

We found interviewees for a total of six cases, and Table 2 offers an overview. To our surprise, however, none of the six cases were successful (i.e., none achieved sustained implementation). Indeed, we found that even a project that we had long thought of as successful had resulted in only a pilot. Although some sponsors refused to participate, we are thankful that all project facilitators we found agreed to be interviewed. The lack of success

TABLE 2 Cases overview

Case	Initiator	Sponsor	Facilitator	Shippers
DE_Furniture (1998)	Sponsor	Local Industry Association	Research institute	50 furniture manufacturers
DE_MUC (2004–2007)	Sponsor	Bavarian Ministry of Economics	Research institute	3 automotive suppliers
SE_Forestry (2004–2008)	Sponsor & Facilitator	Research institute		8 Swedish forestry producers
UK_Starfish (2009–2011)	Facilitator	Institute of Grocery Distribution	University	27 companies: 6 retailers, 3 wholesalers, and 18 of their suppliers
SE_Starfish (2012–2014)	Sponsor	Dual: Swedish Administration of Transport and a research orchestrator	University	2 retailers and 5 of their suppliers
DK_Log (2014–2017)	Facilitator	Dual: Danish government and Danish Transport Administration	University	6 Danish companies: 4 manufacturers, 1 industrial material supplier, and 1 B2B retailer

Note: In many cases, participants included both customers and their suppliers. From a logistics perspective, both types of supply chain members are shippers that could share transportation and warehousing resources. Hence, we decided to consistently use the term horizontal to describe the collaboration.

made the search challenging, as participants are typically hesitant to publicly report failures. Further, this lack of success meant that the projects did not produce artifacts, such as project reports or media reports, making them impossible for people to find unless they were aware of the projects at the time they were being carried out. Hence, we do not know how many more SHLC projects actually existed.

Data collection

Our multiple-case study combined multiple data collection methods. Our primary data sources were semi-structured interviews (interview guide in Appendix A) and any available project-related publications, data repositories, meeting notes, and presentations. For each case, we traced and contacted all of the participants we could find; these participants usually included the sponsor, the facilitator, and the shippers. With the exception of one interview (which was ad hoc, with notes taken)—we recorded, transcribed, and sent each interview to the interviewee for feedback. Table 3 shows the participants who agreed to collaborate in our research; their interviews are included in the case database.

This richness of data contributed to both our highly detailed account and construct validity of the studied cases. This is particularly true of the SE_Starfish and DE_Furniture cases, which two of us facilitated. Further, in all cases, in addition to the interviews and project work material, we examined any other publicly available

material related to the research—including scientific papers, books, and reports that included project data, and any other related information we could find online.

Within-case analysis

The goal of a within-case analysis is to structure, define, reduce, and make sense of case information collected from various sources. Our within-case analysis therefore consisted of three steps: code the interviews, conduct intratextual analysis of each interview, and summarize each case. Appendix B describes our coding process in detail. In essence, we coded the interviews to capture the story of each case and match the theoretical frame. Once we completed the interview coding, we began the intertextual analysis by comparing participant storylines. Our goal here was to compare individual interviews and abstract from the particulars to the broader meanings of the interviews to form a rich description of the cases.

While analyzing the interviews, we remained aware of the challenges with retrospective cases—including that interviewees sometimes rationalize and remember events differently from how they actually happened (Voss et al., 2002). Karlsson and Åhlström (1995) suggest that this challenge can be overcome if the researchers themselves are actively involved in the case; this approach applies to our study due to the personal involvement of two of the authors in two of the six cases. To safeguard construct validity, two authors coded the interviews, whereas the other two continuously reviewed that

TABLE 3 Participant and data overview

Case	Participants	Relevant experience	Supplementary data
DE_Furniture (1998)	Facilitator Shipper Shipper	Logistics Consulting CEO Furniture Company COO Furniture Company	PowerPoint presentations Project documents
DE_MUC (2004–2007)	Facilitator A Facilitator B Facilitator C	Academic Researcher Academic Researcher Manager Research Institute	Published book Conference proceedings
SE_Forestry (2004–2008)	Sponsor/ Facilitator	Researcher Academic Researcher	Academic research
UK_Starfish (2009–2011)	Facilitator Shipper A Shipper B	Consultant/Researcher Logistics Manager Retailer Head of Logistics FMCG	Academic research PowerPoint presentations
SE_Starfish (2012–2014)	Facilitator Sponsor Shipper A	Researcher Director Organization Logistics Manager Retailer	Thesis PowerPoint presentations Project documents
DK_Log (2014–2017)	Facilitator Sponsor	Researcher Government Analyst	PowerPoint presentations

coding. Jones and Bartunek (2019) outline the advantages of an inside perspective when it comes to gaining novel data and insights. They also suggest collaborating with authors that were not involved in the cases studied to help maintain objectivity in the interpretations of the findings. As part of the objectivity safeguard, there are several interviewees for each case, and the researchers that had been involved did not interview or code in the cases that they had been involved in themselves, but merely contributed as two out of 16 interviewees. Although the involvement in two out of the six cases has been very limited, we do believe the authors' in-depth understanding of SHLC in line with Jones and Bartunek (2019) "enhance the value of the research conducted (p. 12)."

Table 4 details additional measures we took to ensure validity and reliability. After using intertextual analysis to develop a rich description of each case, we returned to our frame of reference to capture idiosyncratic meanings and experiences, thereby revealing the complexities of the cases as well.

Contrast cases

Finally, to further elaborate on the multiple-case study and validate our findings on why SHLCs struggle, we used primary and secondary data on three contrasting successful HLC cases. Following are brief descriptions of each of the three cases.

- *SE_Retailers (2000–2021)* is a dyadic transport collaboration in Northern Sweden between the two retailers

in the *SE_Starfish* project. We had access to all of the collaboration data on the *SE_Retailers* through the *SE_Starfish* project (Holmberg et al., 2014).

- *US_FMCG shippers (2001–2004)* was an active collaboration among three fast-moving consumer goods (FMCG) shippers in the United States. The shippers were connected using a web system and collaborated actively for several years. We accessed information about this case through archival repositories and an interview with one of the shippers.
- *UK_FMCG Shippers (2007–2021)* is a dyadic backhauling collaboration between two suppliers who were involved in the *UK_Starfish* project. We accessed information about this well-known contrast case through presentation material, as well as through an interview with one of the initiators (a supply chain manager).

Cross-case comparison

The intratextual within-case analysis gave us a solid basis for conducting the intertextual cross-case comparison. As in the within-case analysis, our cross-case comparison was supported by Ostrom's polycentric tenets (Ostrom, 2010; Poteete et al., 2010) and the constructs from agency theory. In the cross-case comparison, we looked for patterns emerging from the stories of the cases. We also specifically looked at the cases' contextual settings to elucidate similarities and differences. Through this cross-case comparison process, we not only identified patterns in the cases but we also validated the within-case analysis (Yin, 2018).

TABLE 4 Methods to Ensure Validity and Reliability. Based on (Yin, 2018)

Criterion	Method
Construct validity: identifying correct operational measures for the concepts being studied.	The research framework was adapted from relevant policy literature. The interviews were sound recorded and transcribed. Transcripts were sent to informants for review and corrected as suggested by the informants. Multiple agents in each case were interviewed. Multiple data types were evaluated (reports, academic journals, interviews).
Internal validity: seeking to establish a causal relationship, whereby certain conditions are believed to lead to other conditions, as distinguished from spurious relationships.	Patterns were matched across cases.
External validity: defining the domain to which a study's findings can be generalized.	Explicit sampling criteria Description of actors and situations
Reliability: demonstrating that the study can be repeated with similar results.	Interview protocol Information on UK_Starfish, SE_Starfish, and SE_Forestry is publicly available in published papers and reports.

TABLE 5 Description of coding categories applied to the interviews

Coding category	Theory	Topics covered
Clearly defined boundaries	Commons theory	Participants and the resources they were sharing
Clear and proportional equivalence between benefits and costs	Commons theory	Potential gains, savings, and what was needed to achieve those results
Collective choice arrangements	Commons theory	How the participants considered and included other stakeholders
Monitoring graduated sanctions and conflict-resolution mechanisms	Commons/agency theory	Procedures to identify rule violations and efficient conflict-solving strategies
Nested enterprise and self-determination	Commons theory	The level of autonomy participants had to make decisions
Goal conflicts	Agency theory	Extrinsic motivation of participants; objectives and measurable goals that drive participants behavior
Adverse selection—skills	Agency theory	Participant capabilities, such as the ability or inability to complete tasks; the added value a participant brings to the project; handicaps attributable to participants
Moral hazards	Agency theory	Events and actions that reflect the participants' effort level as dedicated to the project or other activities
Control	Agency theory	Mechanisms that the sponsor and facilitator use to limit information asymmetry, moral hazards, and adverse selection

RESULTS: WITHIN CASE

As Table 5 shows, we applied specific coding categories to each of our cases. After several rounds of coding, we condensed the eight polycentric tenets of commons theory into five summarized tenets to adapt the commons theory to the logistics context under study.

This section has two parts. First, we summarize the results of applying the coding categories to the six cases. Table 6 gives an overview of the within-case findings. Second, we narrate what is likely the most famous SHLC

case—UK_Starfish—which served as inspiration for both SE_Starfish and DK_Log. Interested readers can find narrations of the other five cases in the supporting information (online supplement Part B).

UK_Starfish (2009)

The UK_Starfish project was promoted by a large retail association and facilitated by a UK university. A postdoc researcher coordinated data collection and analysis of

TABLE 6 Overview of case findings

	Agency factors	Polycentric tenets	Project result	Agency factors affecting report	Reported result
DE_Furniture (1998)	<ul style="list-style-type: none"> Goal conflicts -Facilitator: Funding -Shippers: Reduce costs, funding Adverse selection problems -Facilitator: Lack of experience -Shippers: Trust Moral hazards problems -Facilitator: Simple rates -Shippers: Support, data sharing Controls: Limited output control 	<ul style="list-style-type: none"> -Yes Boundaries -No Cost-benefit -No Collective -No Conflict resolution -No Self-determination 	Feasibility study	The sponsor failed to identify the strong competition and lack of trust among shippers. The facilitator could not influence shippers to collaborate. The group was heterogeneous, and the initiative did not start with leaders but rather addressed everyone all at once.	Report and potential economic savings (11%)
DE_MUC (2004–2007)	<ul style="list-style-type: none"> Goal conflicts -Facilitator: Book -Shipper: Innovative idea Adverse selection problems -Facilitator: Theoretical -Shippers: Rivalry Moral hazards problems -Facilitator: Lost academic interest -Shippers: No business case Controls: Limited output control 	<ul style="list-style-type: none"> -Yes Boundaries -No Cost-benefit -No Collective -No Conflict resolution -No Self-determination 	Feasibility study	Shippers were selected by convenience. Neither shippers nor facilitators were motivated to take HLC to implementation. The project was theoretically rather than managerially oriented. A business case was not calculated, nor was it requested by the shippers. The project was not continued by the facilitator since the topic dropped from academic interest.	A book, 14% cost savings, adaptability, and flexibility
SE_Forestry (2004–2008)	<ul style="list-style-type: none"> Goal conflicts -Facilitator: Papers -Shippers: Cost savings Adverse selection problems -Facilitator: Lack of experience -Shippers: N/A Moral hazards problems -Facilitator: Did not study failure -Shippers: N/A Controls: Limited output control 	<ul style="list-style-type: none"> -Yes Boundaries -Yes Cost-benefit -Yes Collective -Yes Conflict resolution -Yes Self-determination 	Pilot	Shippers knew each other, had a good environment, and were willing to collaborate. The facilitator helped with savings estimations and the pilot. However, the facilitator could not develop capabilities for shippers to maintain the HLC and did not identify a provider that could cover the capabilities gap for the shippers.	Academic article and potential economic savings (14%)
UK_Starfish (2009–2011)	<ul style="list-style-type: none"> Goal conflicts -Facilitator: Funding -Shippers: Reputation Adverse selection -Facilitator: Theoretical -Shippers: Internal alignment Moral hazards -Facilitator: Simple rates 	<ul style="list-style-type: none"> -Yes Boundaries -No Cost-benefit -No Collective -No Conflict resolution -No Self-determination 	Feasibility study	One shipper had executive support for SHLC and was already collaborating with another shipper. Most of the other 27 did not have executive support. Shippers were concerned about anticompetition laws. The facilitator presented a theoretical exercise. The project finished with no	Academic article and potential economic savings (16%)

(Continues)

TABLE 6 (Continued)

	Agency factors	Polycentric tenets	Project result	Agency factors affecting report	Reported result
SE_Starfish (2012–2014)	<ul style="list-style-type: none"> -Shippers: No executive support Controls: Limited output control Goal conflicts -Facilitator: Papers, funding -Shippers: Cost savings Adverse selection -Facilitator: Theoretical -Shippers: Interest Moral hazards -Facilitator: Focus on another project -Shippers: Support, data sharing Controls: Limited output control 	<ul style="list-style-type: none"> -Yes Boundaries -No Cost-benefit -No Collective -No Conflict resolution -No Self-determination 	Feasibility study	<ul style="list-style-type: none"> Project struggled until the facilitator presented Project 2 to one of the shippers. Shipper A only provided data after that. No development of solutions between shippers. A simple strategic exercise. The facilitator was not able to understand operations of shippers, and the shippers lost trust in the facilitator. 	Report and potential economic savings (6%)
DK_Log (2014–2017)	<ul style="list-style-type: none"> Goal conflicts -Facilitator: Publications -Shippers: Cost savings Adverse selection -Facilitator: Theoretical -Shippers: Resources Moral hazards -Facilitator: Limited search -Shippers: Support, data sharing Controls: Limited control of administrative output 	<ul style="list-style-type: none"> -No Boundaries -No Cost-benefit -No Collective -No Conflict resolution -No Self-determination 	Kick-off	<ul style="list-style-type: none"> The facilitator could not find suitable shippers. Shippers did not provide enough resources or have executive support. The exercise was too theoretical. 	No public report found

27 shippers for UK_Starfish. The project had the strong support of one participant, Shipper B, a leading food producer and Fortune 100 company whose supply chain director was co-chair of the retail association at the time and was pushing to promote environmental sustainability. Shipper B had an ongoing simple dyadic HLC with a direct market competitor; this HLC was exemplified during the project launch as a successful and beneficial collaboration. The project established clear boundaries; its members were large corporations, and all were association members who knew each other. The resources to be pooled were defined as transportation flows and were understood by all participants.

Participant motivations were diverse. The project facilitator was thrilled about having the opportunity to conduct the analysis exercise with such a large pool of shippers. He believed that the exercise would be continued and provide good opportunities for future projects. The shippers were interested in evaluating the potential reductions in cost and emissions. Once the retail association members saw how many other large companies were participating, they rushed to join.

The facilitating organization was selected through its relationship with the sponsor. Although the analyst that facilitated the project had extensive experience in network modeling for individual companies, he lacked experience orchestrating SHLC. The shippers declared themselves like-minded companies interested in SHLC, but they also recognized that they lacked the technical capabilities and executive support to implement it. The shippers wanted only a minimal investment and contributed £1500 to participate in the project.

The 27-company SHLC's potential was calculated as decreasing costs by at least 10%, as well as reducing CO₂ emissions. Savings were expected through minimizing empty backhaul miles and consolidating loads. The facilitator presented the opportunities to the shippers, who decided whether they wanted to initiate SHLC with another compatible shipper. The potential savings were calculated with simple rates, and the shippers considered the potential savings presented to be unrealistic. The shippers and the facilitator agreed that the exercise was theoretical and that the suggested practices would be difficult to implement in reality. Hence, the benefits and cost of implementing the suggestions were not clear. Thus, although the analyzed results showed SHLC's great potential, the shippers never implemented it. Finally, monitoring and conflict-resolution mechanisms were considered a potential problem for SHLC implementation, and shippers were unsure about whether anti-competition laws would allow them to maintain a direct relationship with competitors.

CROSS-CASE COMPARISON

Here, we first compare the progress of the six SHLC cases (outlined in Table 6) with three contrast cases that successfully implemented HLC (see Table 7). We then use the condensed tenets of the commons theory and the main variables of agency theory to structure the findings of this cross-case comparison. Finally, we examine the control mechanism of the SHLC cases to further understand why they failed.

Before comparing the tenets of commons and agency across the cases, we examined the contextual factors. Figure 1 shows these factors and the progress toward collaboration in both our six cases and the three contrast cases. US_FMCG is on the left, as the collaboration was short-lived, whereas the still-active SE_Retailers and UK_FMCG cases are on the right.

As Figure 1 shows, the projects DK_LOG, DE_MUC, and SE_Starfish were sponsored by public sector agencies (e.g., federal or regional grant agencies). Of the three, DK_Log managed only to kick-off, whereas DE_MUC and SE_Starfish each achieved only kick-off and a feasibility study. DE_Furniture and UK_Starfish (sponsored by industry associations) also created feasibility studies, whereas SE_Forestry stands out as the only case to actually reach a pilot implementation, which involved three out of the eight shippers in the project. It should be noted that SE_Forestry was both sponsored and facilitated by the same industry association. We now examine and elaborate on each of the commons' tenets and agency factors in relation to these cases; Table 8 offers an overview.

Applying polycentric tenets across the cases

We first outline Ostrom's tenets of polycentric governance.

Clearly defined boundaries

According to Ostrom (2010), having boundaries that clearly identify the users and the pooled resources is a critical success factor for enabling an emerging self-managed structure. With the exception of DK_Log, membership and common-pool boundaries were clearly defined in all cases, and all participating shippers knew each other. Indeed, in some cases, a few of the shippers had already tried simple dyadic HLC and understood the resources that they could pool with other shippers. In contrast, in the DK_Log project, the shippers were

TABLE 7 Contrast cases

	Agency factors	Polycentric tenets	Project result	Agency factors affecting report	Reported results
SE_Retailers (2000–now)	<p>Goal conflicts</p> <p>–Shippers: cost savings and secure capacity (no conflicts)</p> <p>Adverse selection & moral hazards</p> <p>–No: developed trust</p>	<p>–Yes Boundaries</p> <p>–Yes Cost–benefit</p> <p>–Yes Collective</p> <p>–Yes Conflict resolution</p> <p>–Yes Self-determination</p>	<p>Long-lasting HLC between competitors in Northern Sweden that reduced both shippers' empty miles. This is a simple HLC, created between two parties.</p> <p>Transports are operated by an LSP.</p>	<p>Shippers identified the opportunity and devised the operational method and cost sharing calculation.</p>	<p>No public report published</p>
US_FMCG (2001–2004)	<p>Goal conflicts</p> <p>–Shippers: cost savings (no conflicts)</p> <p>Adverse selection & moral hazards</p> <p>–No: the shippers had executive support on the operational approach and developed logistics capabilities. The shippers used a facilitator to match the lanes.</p>	<p>–Yes Boundaries</p> <p>–Yes Cost–benefit</p> <p>–Yes Collective</p> <p>–Yes Conflict resolution</p> <p>–Yes Self-determination</p>	<p>Horizontal logistics collaboration among three US shippers that lasted for 2 years. The shippers reduced backhaul miles using a logistics sharing platform.</p>	<p>The leading shipper used a network facilitator to identify the opportunity. The HLC among three FMCGs produced lower savings than initially expected, but they kept collaborating as the savings were still significant. US FMGC A invested \$250,000 to identify opportunities.</p>	<p>US FMGC A saved \$2 million in the first year</p>
UK_FMCG (2007–now)	<p>Goal conflicts</p> <p>–Shippers: cost savings (no conflicts)</p> <p>Adverse selection & moral hazards</p> <p>–No: the shippers had strong executive support, matching cultures, a hands-on operational approach, developed logistics capabilities, and owned their logistics assets.</p>	<p>–Yes Boundaries</p> <p>–Yes Cost–benefit</p> <p>–Yes Collective</p> <p>–Yes Conflict resolution</p> <p>–Yes Self-determination</p>	<p>Long-lasting HLC between competitors in the UK that reduced both shippers' empty miles. This is simple HLC, created between two parties. Shippers rely on phone calls to coordinate.</p>	<p>Shippers identified the opportunity and devised the operational method and cost saving mechanism that was fair for both parties. The fact that they were both large shippers helped the initiative gain respect and support.</p>	<p>178,000 miles saved on the first year. More savings in the consecutive years.</p>

Note: The contrast cases are dyadic/triadic HLC. The SE_Retailers and UK_FMCG shippers participated in SE CLOSER and UK_Starfish, respectively.

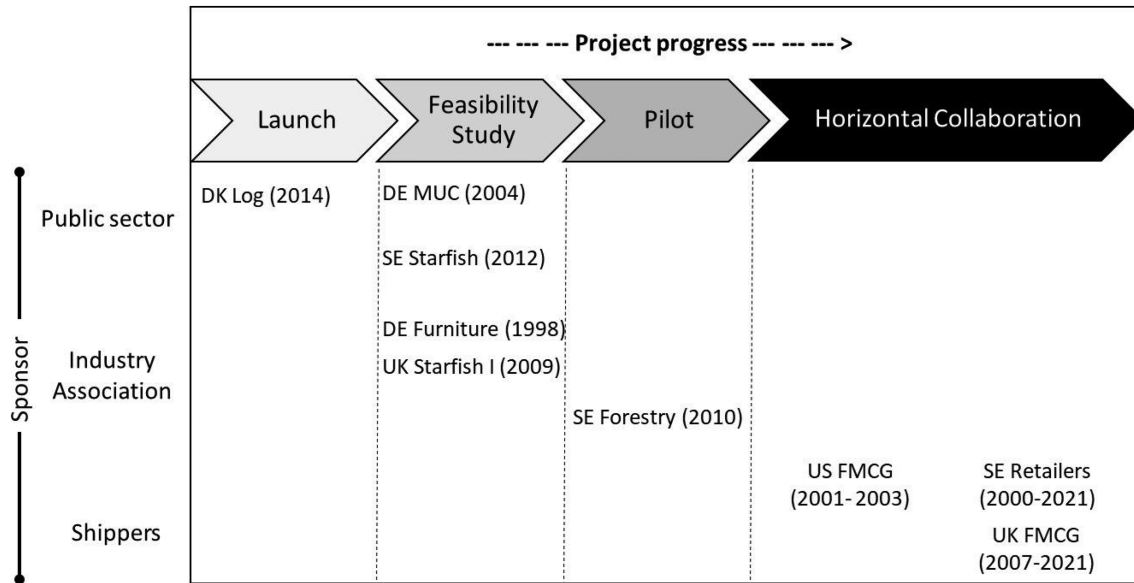


FIGURE 1 Project progress

heterogeneous firms that had little or no previous relationship to each other and no experience pooling resources.

As commons theory predicts, the successful contrast cases all displayed clearly defined boundaries and were simple dyadic HLC in which the resource to pool was evident to the participants.

Clear and proportional benefit/cost equivalence

One of the main tasks for facilitators is to estimate SHLC's potential benefits accurately. However, in most of the sample cases, the cost savings estimations were calculated using simple (instead of actual) rates that did not accurately measure the potential savings (Holmberg et al., 2014, p. 30). In most cases, the shippers understood that the presented potential savings were unrealistic. The potential project gains and how those gains would be shared were clear only in the SE_Forestry case. Most of the cases failed to provide a business case that was convincing enough to motivate shippers to initiate a pilot. In contrast, several shippers in SE_Forestry had already decided that collaboration was beneficial and necessary; they simply needed the facilitators to help them determine how best to share the gains and overcome the operational challenges. In all other cases, there was no clarity about the potential gains, and few strides were made toward operationalizing the projects and proposing pooling implementation. Further, in all three of the successful contrast cases, participants had agreed on the cost and profit-sharing method at the start of the project.

Collective choice arrangements

The SE_Forestry case was the only project that included most of the relevant stakeholders, and the shippers used their own equipment to move their goods. This is in contrast to the other cases, where the shippers relied mainly on carriers and service providers for transportation. This use of transportation service providers was important for several reasons. First, carriers and LSPs sometimes held the shippers' data, so projects could not start unless, for example, the LSPs shared the data. Moreover, the LSPs felt threatened by SHLC as it would reduce the total number of trips and thus mean less business for them. Second, if the SHLC required more complex coordination, service providers would have to increase their capabilities. Thus, at the extreme, SHLC could mean that service providers in general would lose business and/or that individual providers would lose business to more-capable service providers.

Monitoring/graduated sanctions/fast and fair conflict-resolution mechanisms

In our cases, none of the interviewees mentioned any conflicts occurring. However, in all cases except SE_Forestry, shippers lacked monitoring, graduated sanctions, and conflict-resolution mechanisms. In SE_Forestry, these mechanisms were largely implied as all of the shippers had known each other for a long time. Further, because they were all part of the Forestry Association, they had multiple links that held them

TABLE 8 Cross-case comparison: overview of findings

Coding category	SHLC cases	Contrast cases	Insights and observations
<i>Commons:</i> Clearly defined boundaries	In five cases, the descriptions and kick-offs had defined boundaries. One case (that did not collect data) did not define boundaries at all.	Yes, clear boundaries established from the start of the initiatives.	When the membership for the projects is not clearly defined, the participants simply do not contribute, as showed in one case. As the other SHLC cases did have either clearly or somewhat defined boundaries, lack adherence to this tenet did not cause the failure in the cases studied.
<i>Commons:</i> Clear and proportional equivalence between benefits and costs	No, only partially in one case (SE_Forestry). The other cases lacked a clear business case.	Yes, all cases had clearly defined business cases.	Shippers only participate when a very clear cost–benefit is provided (contrast cases) and a research model on supply chain pooling does not suffice to convince shippers to participate, as shown in the SHLC cases. Compared with the other SHLC cases, SE_Forestry did provide a more elaborate and accurate cost–benefit analysis, convincing 3 of the 8 shippers to participate in a pilot.
<i>Commons:</i> Collective choice arrangements	SHLC cases where shippers outsourced transportation were unsuccessful. Including LSPs was unsuccessful.	Yes, all the cases had collective choice agreements in place.	Pooling resources makes more sense if you have the resources to pool. Including participants' whose business model is threatened by SHLC/HLC, such as carriers and LSPs, is contra productive.
<i>Commons:</i> Monitoring, graduated sanctions, and conflict resolution mechanisms	The cases lacked a structure to address this. Some of the shippers in four of the cases had long-standing relationships, somewhat decreasing the need to formally address this.	These dyadic setups were formed between people very familiar to each other.	All SHLC and contrast cases lacked formal monitoring, sanctions, and conflict resolution mechanisms. The closer the participants were to each other before the project, the more successful the collaboration was in all of the cases. However, as our dataset does not indicate any conflicts between the shippers, the lack of mechanisms for conflict resolution and sanctions was not deemed as reason for failure.
<i>Commons:</i> Nested enterprise and self-determination	Generally, lack of self-determination prohibited shipper representatives from progressing.	Yes, strong executive support from the start.	Executive support is essential to achieve success, as demonstrated by the success of the contrast cases and the

(Continues)

TABLE 8 (Continued)

Coding category	SHLC cases	Contrast cases	Insights and observations
			absence thereof in the SHLC projects. Lack of autonomy of SHLC shipper representatives hindered the projects.
Agency: Goal conflicts	Goals not aligned, as most of the facilitators wanted to get funding and publish rather than facilitate collaboration.	The goal of horizontal collaboration was shared among the HLC participants.	Although the sponsors and the shippers appear to have aligned goals, the facilitators were misaligned. The contrast cases had full alignment of goals—successful collaboration was the sole objective of all involved shippers.
Agency: Adverse selection—skills	Facilitators (except one) did not bring collaboration further than theoretical calculation. Facilitator selecting shippers not actually suitable for collaboration.	Shippers choosing equally minded and able peers.	In the SHLC cases, we observe adverse selection happening on two levels: First sponsors selecting facilitators not able to drive SHLC and second facilitators inviting shippers not suitable or interested in collaboration. In the contrast cases, shippers select other shippers that want to collaborate.
Agency: Moral hazards	Ceremonious participation, that is, some participating without actually intending to contribute in the project, was observed in all the SHLC projects.	No, HLC carried out as intended.	The SHLCs suffered from too many participants not actually interested in actually collaborating. As research facilitators have different goals, the effort they put in is not always according to sponsor expectation.
Agency: Controls	Limited input controls; after the SHLC projects started, participants had very little interaction. Extensive interaction occurred only in the SE_Forestry case. Sponsors did not know how to evaluate SHLCs and very little learning output disseminated from the project.	Not studied.	Participants need to interact to develop common values and trust; however, in the SHLC cases, input control was largely missing. When sponsors do not apply output control on the facilitators, learnings get lost, and the same failures get repeated. The facilitators used a wide variety of modeling, with no established method and little transparency.

accountable and prevented misbehaviors. The interviews with SE_Forestry stakeholders surfaced the important challenge of handling anticompetition laws. The shippers were especially concerned about how they could create a legal arrangement that would not hurt them and how

they might avoid trouble with anticompetition laws if they wanted to cooperate with competitors. An SHLC depends on information sharing—specifically, on shippers sharing information on their freight volumes. However, none of the projects had any formal or informal

sanctions or resolution mechanisms in place if shippers refused to share. In the DE_Furniture and DK_Log projects, for example, shippers refused to share information and faced no sanctions.

Nested enterprise and participant self-determination in the common pool

With the exception of the SE_Forestry case, all SHLC cases grappled with the self-determination problem. Among the issues were a lack of executive support and a lack of both decision-making power and self-sufficiency among the shipper representatives who attended the project meetings. In the contrast cases, the HLC had strong executive team support and was integrated with the shipper's supply chain strategy.

The failure cases we analyzed attempted to replicate their success with simple dyadic collaborations through a systematic attempt to bring multiple shippers into collaboration. Each shipper, however, had its own idiosyncratic culture and values, which significantly complicated the potential collaboration. The successful contrast cases dealt with two (or, on rare occasions, three) shippers at a time and suffered fewer collaboration problems due to fewer decision makers involved.

Agency across the cases

Goal conflicts

Agency theory assumes that the members of a cooperative effort will have divergent goals. And, indeed, our data show that project participants' goals were not aligned. Whereas the sponsor's (principal) goal was to initiate change and to promote SHLC, the agents (facilitators and shippers) had other goals.

The sponsors wanted the targeted shippers to change their supply chain practices to improve both their environmental and economic performance. In the DK_Log case, the sponsor approved the SHLC project grant application because of its potential to make Danish transportation greener. The DE_Furniture case's sponsor had seen other furniture manufacturers in the region failing due to high logistics costs and therefore considered SHLC necessary for the remaining manufacturers to survive. Similarly, in the other cases, the sponsors noted that the project's goal was to reduce costs and CO₂ emissions. Often other projects provided the inspiration: "The goal for the [Swedish] Starfish Project was to see if the idea of CO³ [project] could be introduced and implemented in Sweden as well" (SE_Starfish, Sponsor). The principals

also sought recognition—and thus legitimacy—for sponsoring those improvements. The SE_Starfish and SE_Forestry cases were explicit about the need for the sponsors to show their progress.

The facilitators expressed their passion for investigating the shippers' challenges. However, they were also interested in acquiring data and using that data to publish papers and advance their careers. Further, the facilitators needed funding to maintain their research teams; as the facilitator of DE_Furniture states: "... we wanted to solve some problems with a company and get money for it. So that was the thing—finance my people in the department".

The shippers' goal was to evaluate ideas that might reduce their costs and environmental impact. "It was probably 20 to 30 like-minded organizations that recognized that the collaboration ... was more about the ability to match different companies together based on what they've got. So, it was a bit of a 'Let's pull all the information together where we've got all of our inefficient lanes'" (UK_Starfish, Retailer). However, across the cases, the shippers were not very motivated to pay for the investigation or to take implementation risks; instead, they wanted the sponsors to subsidize the investigation. Some shippers, such as in DE_Furniture, recognized that they suffered from a shortsighted approach that made initiating the SHLC difficult.

Adverse selection

In agency theory, selecting the agent is a critical process that impacts that agent's ability to fulfill the delegated tasks. Still, the theory assumes that the principal cannot have full information about an agent's skills and a priori motivations (Ouchi, 1979). Indeed, in our work, we observed that both sponsors and facilitators struggled to find the right balance between two poles: simply using shippers (agents) from among their known associates to conveniently carry out tasks and expanding the search so broadly that it created negative consequences for the project. In our cases, facilitators and shippers were selected in several different ways; some were chosen by a single sponsor, whereas others were chosen jointly by a group of organizations.

In terms of facilitator selection specifically, some were selected by applying for funds (as in the cases of DK_Log and DE_MUC), whereas others had an existing connection to the principal (as in DE_Furniture, UK_Starfish, SE_Starfish, and SE_Forestry). We nonetheless found similar results related to adverse selection for SHLC facilitators. For example, facilitators were sometimes included without considering limitations that would handicap the

SHLC implementation. Recruiting the facilitator—either by requesting funds or through previous relationships—did not mean that the facilitators had any HLC experience, let alone experience orchestrating SHLCs. Overall, the facilitators were skilled in research and modeling, but had no experience with helping heterogeneous shippers collaborate. Other lacked sufficient industry contacts: “The problem is that we didn’t succeed in it because we couldn’t find enough other companies that were possible to match in the system. But, again, it was a very good idea” (DK_Log, Facilitator). The UK_Starfish’s facilitator built an aggregated model, but the UK shippers found it to have limited applicability because it ignored the fact that different shippers have different operational parameters. Further, the SHLC projects shared a basic erroneous assumption that the data they received represented the stable situation of the target shippers. One of the shippers noted that an analysis—such as that of the Starfish_UK—that took more than a year to produce had limited applicability: “The project was so manual and time-consuming [...] by the time that I had a chance to review it and start conversations, up to 12 months have passed, and by the very nature of that, all of that information on all of it—a good amount of that information—would have been out of date” (UK_Starfish, Retailer).

The government-sponsored projects (DK_Log, SE_Starfish, and DE_MUC) let the facilitator select any kind of shipper, whereas those sponsored by industry associations (DE_Furniture, UK_Starfish, and SE_Forestry) focused on their industry members. When facilitators chose shippers for the SHLC, they typically either invited shippers that they had a personal relationship with, or they used “cold calls” to find shippers. “Hey, there’s a topic we’re applying for, but we need some companies, and I’ve got some companies I’m on good terms with and that I know well, and who know me well too [laughs]. I’m just going to give them a call and I’m sure they’ll participate” (DE_MUC, Facilitator B). In the latter case, facilitators struggled to actually find shippers interested in joining the project and carrying it out. For example, the DK_Log project found only five heterogeneous shippers in Denmark (the sixth participant being an LSP), which made it difficult to find matching freight flows. In contrast, the SE_Starfish facilitator found many potentially compatible shippers but struggled to attract and maintain their attention. In fact, the facilitator was able to get executive attention only when one of the shippers got interested in another of his projects.

On the flip side, when the facilitator already knew the shippers, we found that the sponsor rarely received full information about the shippers’ skills and motivations. As a result, the sponsor may not have understood the shippers’ limitations of implementing SHLC. For

example, in the case of DE_MUC, the shippers had limited interest in the actual project implementation and joined solely based on their relationship with the facilitator.

Finally, in the cases with the industry association in the role of the principal—that is, DE_Furniture, UK_Starfish, and SE_Forestry—shippers were selected because they were part of that industry association. However, the sponsor and the facilitator were unable to discern, a priori, shippers that had strong objections to implementing SHLC due to their own handicaps and local industry rivalries.

Moral hazards

In traditional delegation contexts, moral hazards arise when the agents decide to act to achieve outcomes that do not necessarily benefit the principal. In the SHLCs, participants did not put in full effort once the projects got underway. Indeed, in, for example, SE_Starfish, the facilitator started other more lucrative projects first instead of leading the project to implementation.

Moreover, the facilitators recognized that they failed to provide key elements to the projects and, at some point, diverted their attention to projects with higher perceived potential benefits for them. For example, in the DE_MUC case, the facilitator noted that the project had not developed a business case for the potential implementation, which (as he recognized) was critical if shippers were to understand the implementation’s potential. The DE_MUC facilitator dropped the project entirely when its data seemed unlikely to lead to publications.

Similarly, shippers did not put enough effort into reaching project success. The shippers were charged with providing data and helping to develop the SHLC solution. However, we observed that shippers relied on the facilitators and expected them to carry the project’s heaviest burden. For example, in the SE_Starfish case, one of the shippers explicitly demanded that the facilitator lay out all of the details to make SHLC possible. However, in the same project, the shippers did not share the fact that they were already collaborating in one northern region when they submitted the data to the facilitator. So the facilitator calculated the potential savings unaware of this collaboration because it did not show in the data. When that analysis was initially presented, it had to be adjusted because of this omission; according to the facilitator, that incident caused a downfall in the shippers’ trust.

Further, for all projects, the data gathering and calculation process was long (more than a year in most cases) in part because the shippers either did not make data collection a priority or were hesitant to share their data,

despite having agreed to do so when joining the project. Further, the shipper's representatives had to attend to their daily job responsibilities, so they sometimes delayed SHLC tasks due to competing priorities.

Finally, once the results were presented, the shippers were hesitant to collaborate due to intracompany misalignment. That is, when the shipper's representatives took the study results back to their organizations, they faced push back from departments and executives that were unwilling to risk the organization's competitive advantage. "Each company was not very willing to give us this data because it's their property and they were afraid that someone would use the data not just for the project" (DK_Log, Facilitator). For their part, shippers were concerned that implementing SHLC would affect their customer service and operational flexibility; they were also worried that competitors would study their operations. Thus, they joined the collaboration project in apparent good faith yet had no intention of actually collaborating. Unfortunately, most projects lacked the requisite executive engagement to shield these concerns and provide the support needed to find the right solutions for the project. Interestingly, although the shippers did not actually go on to collaborate, it did not stop some of them from publicly conveying their commitment to these projects.

Control mechanisms in SHLC

To understand why SHLCs fail, we also review how the sponsors and facilitators used their controls to direct the facilitators and shippers respectively toward SHLC implementation. As we described earlier, goal conflict, adverse selection, and moral hazards were evident in the targeted cases. To evaluate which actions the sponsors and facilitators took to minimize those agency problems, we investigated the controls used in each case. As in the three assumptions evaluated above, the sponsors and the facilitators applied similar controls in all cases.

Input controls related to participant selection were similar in all cases, but with a few small differences between government- and industry-sponsored projects (as explained in the Section 5.2.2). The projects applied the other two input control components—training-development and socialization—only to a small degree in all cases. Facilitators were supposed to be self-sufficient, and sponsors offered only limited instructions to prepare them for the project. To promote similar values and beliefs, presentations were held at the beginning of the projects, and SHLC's potential benefits were highlighted. However, once the projects started, there were limited opportunities for shippers to interact and develop

common values and beliefs. Most projects consisted of requesting, compiling, and sharing data, then analyzing and sharing the results. Consequently, constant interaction between the participants was not promoted by the facilitator, and project participants met only occasionally—if at all.

Output controls were surprisingly limited in all projects. The goal of the sponsors was to promote collaboration to improve efficiency and reduce environmental impact, but they had difficulties evaluating and measuring project progress. "Because the projects in this pool [funding program] differed so much from each other, there was no uniform way to evaluate the projects. It was more like we had to fill in the same type of documents" (DK_Log, Sponsor). They did not request continuous updates; in some cases, they received progress reports only every other month. Most SHLCs considered submitting a report at the end of the project as the main output and did not define any intermediary milestones. Although an initial milestone plan was supposedly required to start the project or apply for funding, few sponsors checked their progress against such plans.

Behavior controls were also limited on these SHLCs. General guidelines existed regarding project steps (data gathering, analysis, and results sharing), but the facilitators could decide the appropriate level of detail for them and choose the most suitable methodology. For example, some facilitators used only flat rates to estimate SHLC's potential economic savings, whereas other facilitators used actual transportation rates, which showed more moderate savings. "We could only find tiny percentage improvements in our collaboration. We were talking about like 1 or 2% savings, and that was very different from the 16% or 14% or 30% that other HLC projects were showing" (SE_Starfish, Facilitator). The lack of consistency in savings calculations leads to biased comparison between projects and unreasonable expectations of shippers. Some of the shippers expected higher savings than what was shown in previously calculated and published projects.

SHLC IN THE SCM CONTEXT AND KEY OBSERVATIONS

Comparing our cases with the three contrast cases, we recognize common sources of failure, such as a lack of top management commitment and leadership, as well as vague and poorly aligned purpose, goals, and metrics. These factors are typically viewed as essential to success both in general change management literature (e.g., Kotter, 1995; Luecke, 2003; Rafferty et al., 2013) and in supply chain collaboration literature (e.g., Fawcett

et al., 2008; Lambert et al., 1999; Ralston et al., 2017; Wu & Choi, 2005). Although these general barriers to change are certainly valid explanations in our study, the nested organizations in our cases include leadership layers that further complicate the collaborations. Another clear difference between our cases and those frequently cited in the literature is the number of shippers involved. Whereas the more successful contrast cases involved only two or three shippers, our cases included many more independent participants, which increases complexity. Fewer participants logically enable stronger leadership and make the potential benefits clearer for everyone, yet it also counteracts the point of a wider SHLC: Synergies increase along with the number of shippers, so long as it is still practically possible to coordinate the project (Crujssen, 2020, p. 76). The SHLC context differs from the vertical collaboration context that most supply chain collaboration literature has studied to explain failures, which includes the dyadic collaboration between shippers and LSPs (Chen et al., 2010; Lambert et al., 1999), the buyer-initiated collaboration between suppliers (Wilhelm, 2011; Wu & Choi, 2005), or dyadic collaborations between buyers and suppliers (Fawcett et al., 2012; Whipple & Frankel, 2000). To locate potential enablers that better align with our SHLC cases, we look beyond those obvious and conventional explanations to build alternative or complimentary explanations using the theoretical lenses of the commons and agency theories. We now summarize our key observations, which are illustrated in Figure 2.

Cost-benefit: communication failure

With its year-long pilot, the SE_Forest case went further than the other SHLC cases, in part because its shippers were already convinced of the collaboration's benefits before the start. From this, we observe that clearly communicating both the costs and the benefits of collaboration to shippers at the start of an SHLC is important to a project's success.

Collective agreements: failure to pool appropriate shippers

Not all shippers are suitable for pooling. Some shippers are direct competitors, whereas many have completely outsourced their transportation. Although it does appear to be a trivial insight, our data suggest that failing to select shippers that actually can pool does in fact make a difference.

Self-determination: facilitation decouples shippers

Commons theory predicts adverse effects of outside intervention in managing a common pool, because when outside entities use adjustment mechanisms to foster collaboration, participants do not learn to cooperate. Although lack of executive support traditionally

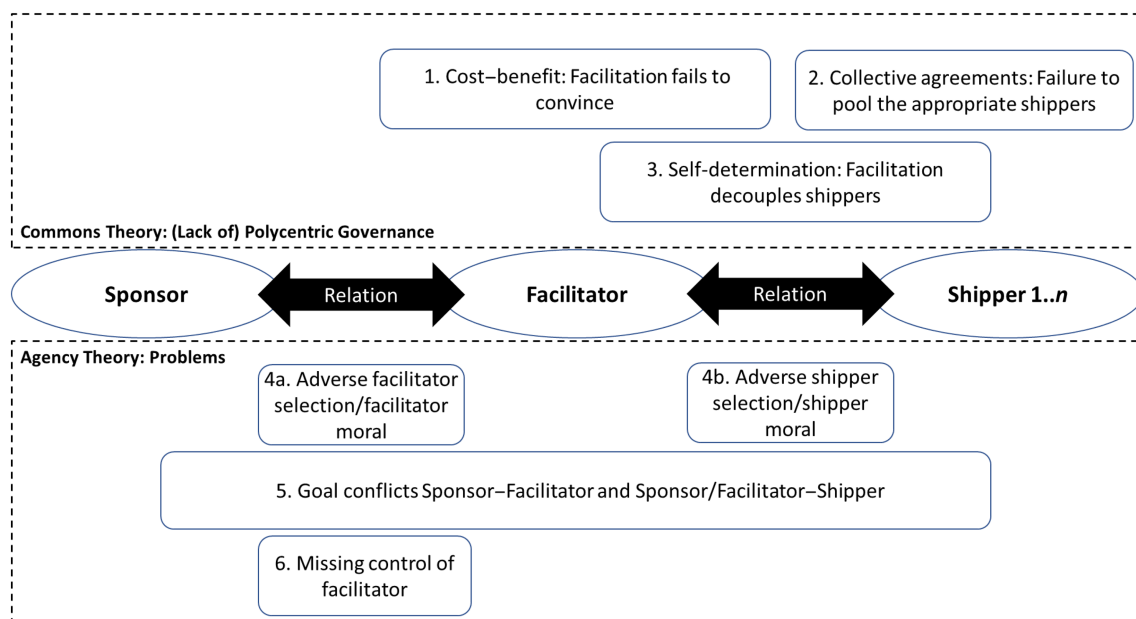


FIGURE 2 Study observations

contributes to collaboration failure (Fawcett et al., 2012; Mentzer et al., 2001), our data explain why facilitators closer to the supply chain members—that is, the facilitators who are perceived as less of outside interventionists—achieve more success and sustained success were found only in contrast cases facilitated by the shippers themselves. Previous literature on decoupling in the supply chain has found only ceremonial participation among subsuppliers (e.g., Wilhelm et al., 2016), yet this finding also applies to shippers in a sponsor–facilitator–shipper context. Facilitation works only when it is requested by the involved shippers, that is, when the shippers themselves become the sponsors of the project.

Adverse selection: selection failure in SHLC

Sponsors struggle to initiate SHLCs that actually result in implementation (the criteria for success). Our cases show adverse selection at work—that is, many facilitators hired by the sponsors accepted the assignments without actually being able to carry out the work and/or without having credibility among the shippers. Moral hazard manifested through facilitators moving on to other more lucrative projects and shippers joining projects without intending to participate in a collaboration. So the sponsors failed to select facilitators that could make the shippers collaborate, and, at the same time (as we outline in Observation 2), the facilitators selected shippers who might have been suitable for collaboration in theory (i.e., they did not fall under the category of shippers in key Observation 2), but that were in fact unwilling to collaborate. We observed this adverse selection at work in several of the cases and in both sponsor-to-facilitator and facilitator-to-shipper relations, as the following observation shows.

Goal conflicts: sponsor–facilitator and sponsor/facilitator–shipper

Although sponsors aimed for increased environmental sustainability and increased transport efficiency, our cross-case comparison indicates that projects sponsored by the public sector (i.e., by federal research funding agencies) were partially driven by the *facilitator's* funding goals. Projects promoted by industry associations fared slightly better and produced more benefits for the shippers (as Figure 1 shows) than those promoted by public sector agencies. All of the industry projects managed to at least gather the data and estimate saving opportunities for project members. The SE_Forestry case even allowed

companies to test their capabilities with a pilot (in which three out of the eight shippers participated). Although that project did not reach implementation, the participating shippers remain interested in exploring collaboration opportunities together.

Project management: no control mechanisms

Our data reveal that SHLC projects lack input, output, and behavior controls. Lambert et al. (1999) highlight the importance of systematic analysis of partnerships over time. In our studies, all projects lacked *sunset reviews*—that is output control/post-mortem project assessments—and thus, the sponsors and facilitators fail to learn from mistakes. Facilitators, who are tasked with generating new knowledge, typically focus on quantifying potential gains (as evidenced by the numerous papers on transport pooling) rather than generating insights into the SHLC implementation process. Hence, the participants (sponsors, facilitators, and shippers) continue to assume that the generally spontaneous and simple dyadic collaborations implemented can model complex systematic multi-shipper collaboration.

DISCUSSION AND FUTURE RESEARCH ON SHLC

Although our research has focused on how and why SHLC failure occurs, future research must seek solutions for how to implement polycentric tenets and avoid agency problems. Based on the observations above, we will outline some suggestions for these future studies.

Investigating collective agreements and shipper self-determination

Many SCM definitions build on a decentralized supply chain with multiple independent decision makers who should reap and share the gains of increased joint effectiveness in a systematic and strategic way (e.g., Carter et al., 2015; Mentzer et al., 2001). To succeed in a complex collaboration without a central authority, governance mechanisms must be in place. This challenge is similar to the challenge in the common-pool resources context, which led us to explore the usefulness of the commons theory. When contrasting the struggling SHLCs with the successful HLCs, we found an obvious difference in how they applied polycentric governance tenets. That is, successful cases applied the polycentric

tenets, whereas the struggling SHLC cases applied few of the tenets beyond clear boundaries. Cases that had outside sponsors and facilitators had more difficulties implementing the tenets of polycentric governance; although this seems counterintuitive, it suggests that supply chains are capable of self-organization to some extent, without outside authorities. Further, whereas the successful HLC cases' achievements might be partially explained by having fewer actors involved, the polycentric tenets summarize important governance mechanisms that all actors can learn from. As more actors get involved, Ostrom's tenets of polycentricity become increasingly important. In the DE_MUC case, shippers joined the project because they knew the facilitators, but the shippers had no real interest in implementing SHLC. Shippers in industry-sponsored projects—such as UK_Starfish—joined because they saw other industry members joining the project. When they received the SHLC proposal, however, internal pressures prevented the shippers from exploring the potential implementation. As our data show, joining SHLC projects does not predict a willingness to implement SHLC.

Crujssen (2020, p. 76) suggests that involving five or six actors is feasible for gain-sharing, but that up to 10 actors is practically manageable in a project. To address Observations 2 and 3, we recommend future research (a) to investigate ways to assess a shipper's sincerity and to mandate that SHLC actually be piloted and (b) to examine how many participants are actually feasible.

Addressing the facilitator

Our data let us compare the goals and pressures of different SHLC participants and how those factors resulted in decoupling (Meyer & Rowan, 1977; Wilhelm et al., 2016). To remedy Observation 1 (facilitator failing to convince shippers of SHLC's benefits), Observation 4 (selection failure/moral hazard), and Observation 5 (goal conflicts), theory suggests using contracts to align goals and incentives (Eisenhardt, 1989a; Whipple & Roh, 2010). As far as we know, none of the SHLCs had contracts that incentivized facilitators or shippers to actually implement collaboration. Future research could investigate how to design contracts to increase the likelihood of implementation, for example, by establishing financial incentives or social control.

Learning from SHLC failures

Given SHLC's general failure and Observation 6 regarding the lack of output control in the SHLC projects, we

first invite future researchers to study SHLC implementation, rather than simply continuing to repeatedly calculate its potential gains. Such theoretical gains are, after all, well known by now (Gansterer & Hartl, 2018). The SE_Forestry case, which for years has been widely cited as an example of a successful SHLC implementation, was, in reality, only a pilot. The shippers discontinued it within a year. Similar projects sponsored from the outside were launched between 1998 and 2016. As Figure 1 shows, the achieved level of progress is not increasing. The DK_Log project, launched in 2014, had participants from previous Starfish projects as key speakers in the kick-off meeting. However, the DK_Log project managed only to launch the project and failed to even complete the feasibility study. Following on Starfish I (2009), Starfish II was initiated in 2016 but did not gather enough data to estimate the potential savings for full truckloads. Some of the same participants are now again attempting SHLC in the EU-funded Logistar project (Logistar, 2020). These projects have produced little to no learning to benefit policy makers and the logistics community. In fact, when we examined the kick-off presentations, we found that the same PowerPoint slides had been used repeatedly to convince shippers to join the projects.

As our data clearly show and as evidenced in the observations, the academic facilitators struggled the most to produce results. So in addition to the previous suggestions to align incentives, future research could address which criteria facilitators might require to succeed in facilitating SHLC.

CONCLUSIONS

Through our multiple-case study, we establish the concept of SHLC—and why and how it fails. Elaborating on the commons and agency theories, we find that SHLC fails because shippers are not convinced of the benefits; sponsors and facilitators choose unsuitable shippers (such as shippers that do not have resources to pool); shippers lack self-determination; sponsors choose unsuitable facilitators (who are unable to facilitate pooling as intended); goals conflict; and projects lack control mechanisms.

Contributions

Our paper makes three contributions to theory. First, we demonstrate the applicability of Ostrom's framework for common-pool resources in a supply chain collaboration context. In an era in which a digital paradigm fuels novel business models, platforms, and shared resources, the theory of the commons offers a strong theoretical framework

for evaluating supply chain projects, which are by nature polycentric. Indeed, Ostrom's framework could be of general interest for any decentralized supply chain project, as it considers the intricate factors that drive or handicap a collaboration project's potential success. We position commons theory beside other traditional theories used to explain and predict outcomes in horizontal collaborations (Crujssen, Dullaert, & Fleuren, 2007; Pomponi et al., 2015). The polycentric approach bridges theories—such as transaction cost economics and resource dependency theory—that favor dyadic approaches with the need for SHLC to integrate the interests of multiple actors.

Second, we contribute to the literature on agency relationships in supply chain projects. Our contribution focuses on organizations trying to change supply chain practices from the outside (Dhanorkar et al., 2018; Harland et al., 2019; Nguyen & Kim, 2019) and compares the outcomes of public sector sponsors promoting change (at DK_Log, DE_MUC, and to some extent, SE_Starfish) with the outcomes achieved when the sponsors are industry associations. Specifically, we illustrate the agency problems this type of project faces, in terms of selecting both facilitators and shippers.

Third, we contribute to the HLC literature by arguing that achieving success with a systematic approach to HLC is significantly more complex than doing so with spontaneous HLC. Elaborating on commons and agency theories, we highlight the implementation challenges that SHLC may face and argue that multishipper collaborations must be treated differently than dyadic/triadic HLCs. Our approach complements previous theoretical models that propose different steps leading to horizontal collaboration (Pomponi et al., 2015), as well as empirical studies that lack a theory-based approach. Further developing and testing the combination of commons theory and agency theory in SCM in general, and SHLC with many members in particular, will be very valuable for both research and practice, especially as demands on supply chain sustainability increase.

Finally, we make an empirical contribution by elucidating SHLC failures, a previously unexplored area. Our study provides new insights into outside facilitation. Facilitators struggle. In line with both commons and agency theories—and contrary to the academic and gray literature addressing HLC and SHLC—we found scarce indications of facilitator effectiveness in driving SHLC in the cases we studied.

Managerial and policy implications


As our accounts of SHLC show, sponsors need to be wary of the complexity and agency occurring in this type of

setting. When deciding to sponsor SHLC, projects must be given enough resources to promote change. In our cases, both the shippers and facilitators failed to stay engaged with the project as other priorities became more pressing. We also recommend frequent meetings among the relevant actors—that is, having shippers actually get together, rather than meeting only with a proxy (facilitator). Only by working together can participants develop an integrated set of solutions.

Ultimately, although these unsuccessful projects had aimed to “expand the pie” and identify win-win opportunities (the *comedy of the commons*), the lack of feedback and collaboration, the lack of convincing benefits, and the lack of incentive alignment kept the participating actors in a “split the pie” mentality, which obstructed the formation of a logistics commons. So although the successful contrast cases in the United States and the EU can be viewed as comedies of the commons (the more they share, the better off they are), to avoid further tragedies of the logistics commons, we must better understand how to design SHLC with multiple participants in ways that better achieve results.

Finally, despite the challenges, many shippers considered the SHLC projects that they engaged in as essential to their learning processes. Future endeavors to implement SHLC will benefit from engaging supply chain members experienced in these types of projects.

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REFERENCES

- ALICE. (2021). Alliance for logistics innovation through collaboration in Europe. ENIDE. Retrieved August 7th. <http://www.etp-logistics.eu/>
- Arvidsson, N. (2017). *Horisontella samarbeten för ökad transporteffektivitet*. Swedish Traffic Administration.
- Bardi, E. J., Coyle, J. J., & Novack, R. A. (2006). *Transport management*. South-Western Cengage Learning.
- Braun, D., & Guston, D. H. (2003). Principal-agent theory and research policy: An introduction. *Science and Public Policy*, 30(5), 302–308. <https://doi.org/10.3152/147154303781780290>
- Brown, T. A. (1981). Shippers' associations: Operations, trends, and comparative prices. *Transportation Journal*, 21(1), 54–66.
- Burgess, R. (1989). Avoiding supply chain management failure: Lessons from business process re-engineering. *International Journal of Logistics Management*, 9(1), 15–23. <https://doi.org/10.1108/09574099810805717>

- Carter, C. R., Rogers, D. S., & Choi, T. Y. (2015). Toward the theory of the supply chain. *Journal of Supply Chain Management*, 51(2), 89–97. <https://doi.org/10.1111/jscm.12073>
- Chen, H., Tian, Y., & Ellinger, A. E. (2010). Managing logistics outsourcing relationships: An empirical investigation in China. *Journal of Business Logistics*, 31(2), 279–299. <https://doi.org/10.1002/j.2158-1592.2010.tb00152.x>
- Choi, T. Y., Dooley, K. J., & Rungtusanatham, M. (2001). Supply networks and complex adaptive systems: Control versus emergence. *Journal of Operations Management*, 19(3), 351–366. [https://doi.org/10.1016/S0272-6963\(00\)00068-1](https://doi.org/10.1016/S0272-6963(00)00068-1)
- CO3 Project. (2020). CO3. NDL/HIDC. Retrieved July 17th from <http://www.co3-project.eu/>
- Crujssen, F. (2012). Collaboration concepts For comodality (CO3) (deliverable D2.1). <http://www.co3-project.eu/wo3/wp-content/uploads/2011/12/CO3-D-2-1-Framework-for-collaboration-full-report-2.pdf>
- Crujssen, F. (Ed.) (2020). *Cross-chain collaboration in logistics* (Vol. 297). International Series in Operations Research & Management Science. Springer.
- Crujssen, F., Bräysy, O., Dullaert, W., Fleuren, H., & Salomon, M. (2007). Joint route planning under varying market conditions. *International Journal of Physical Distribution and Logistics Management*, 37(4), 287–304. <https://doi.org/10.1108/09600030710752514>
- Crujssen, F., Cools, M., & Dullaert, W. (2007). Horizontal cooperation in logistics: Opportunities and impediments. *Transportation Research Part E: Logistics and Transport Review*, 43(2), 129–142. <https://doi.org/10.1016/j.tre.2005.09.007>
- Crujssen, F., Dullaert, W., & Fleuren, H. (2007). Horizontal cooperation in transport and logistics: A literature review. *Transportation Journal*, 46(3), 22–40.
- Daugherty, P. J. (2011). Review of logistics and supply chain relationship literature and suggested research agenda. *International Journal of Physical Distribution and Logistics Management*, 41(1), 16–31. <https://doi.org/10.1108/09600031111101402>
- De Keyser, B., Guiette, A., & Vandembemt, K. (2019). On the dynamics of failure in organizational change: A dialectical perspective. *Human Relations*, 74(2), 234–257. <https://doi.org/10.1177/0018726719884115>
- Dhanorkar, S. S., Siemsen, E., & Linderman, K. W. (2018). Promoting change from the outside: Directing managerial attention in the implementation of environmental improvements. *Management Science*, 64(6), 2535–2556. <https://doi.org/10.1287/mnsc.2017.2748>
- Eisenhardt, K. M. (1989a). Agency theory: An assessment and review. *Academy of Management Review*, 14(1), 57–74. <https://doi.org/10.2307/258191>
- Eisenhardt, K. M. (1989b). Building theories from case study research. *Academy of Management Review*, 14(4), 532–550. <https://doi.org/10.2307/258557>
- Fawcett, S. E., Fawcett, A. M., Watson, B. J., & Magnan, G. M. (2012). Peeking inside the black box: Toward an understanding of supply chain collaboration dynamics. *Journal of Supply Chain Management*, 48(1), 44–72. <https://doi.org/10.1111/j.1745-493X.2011.03241.x>
- Fawcett, S. E., Magnan, G. M., & McCarter, M. W. (2008). A three-stage implementation model for supply chain collaboration. *Journal of Business Logistics*, 29(1), 93–112. <https://doi.org/10.1002/j.2158-1592.2008.tb00070.x>
- Fayezi, S., O'Loughlin, A., & Zutshi, A. (2012). Agency theory and supply chain management: A structured literature review. *Supply Chain Management: An International Journal*, 17(5), 556–570. <https://doi.org/10.1108/13598541211258618>
- Ferrel, W., Ellis, K., Kaminsky, P., & Rainwater, C. (2019). Horizontal collaboration: Opportunities for improved logistics planning. *International Journal of Production Research*, 58(14), 4267–4284. <https://doi.org/10.1080/00207543.2019.1651457>
- Frisk, M., Göthe-Lundgren, M., Jörnsten, K., & Rönnqvist, M. (2010). Cost allocation in collaborative forest transportation. *European Journal of Operational Research*, 205(2), 448–458. <https://doi.org/10.1016/j.ejor.2010.01.015>
- Gansterer, M., & Hartl, R. F. (2018). Collaborative vehicle routing: A survey. *European Journal of Operational Research*, 268(1), 1–12. <https://doi.org/10.1016/j.ejor.2017.10.023>
- Hardin, G. (1968). The tragedy of the commons. *Science*, 162(3859), 1243–1248. <https://doi.org/10.1126/science.162.3859.1243>
- Harland, C., Telgen, J., Callender, G., Grimm, R., & Patrucco, A. (2019). Implementing government policy in supply chains: An international coproduction study of public procurement. *Journal of Supply Chain Management*, 55(2), 6–25. <https://doi.org/10.1111/jscm.12197>
- Heenehan, H., Basurto, X., Bejder, L., Tyne, J., Higham, J. E. S., & Johnston, D. W. (2015). Using Ostrom's common-pool resource theory to build toward an integrated ecosystem-based sustainable cetacean tourism system in Hawai'i. *Journal of Sustainable Tourism*, 23(4), 536–556. <https://doi.org/10.1080/09669582.2014.986490>
- Holmberg, A., Sternberg, H. & Sjögren, J. (2014). *Closer Starfish: A research project investigating freight distribution cooperation opportunities in Sweden*. <http://www.lu.se/lup/publication/4392945>
- Hutt, M. D. (2008). Engaging corporate partners to bridge the theory-practice gap. *Journal of Supply Chain Management*, 44(2), 68–72. <https://doi.org/10.1111/j.1745-493X.2008.00057.x>
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305–360. [https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X)
- Jepsen, L. B. (2014). Critical success factors for horizontal logistic collaboration. In T. Blecker, W. Kersten, & C. M. Ringle (Eds.), *Innovative methods in logistics and supply chain management* (Vol. 18) (pp. 459–475). epubli GmbH.
- Jones, E. B., & Bartunek, J. M. (2019). *Too close or optimally positioned? The value of personally relevant research*. Academy of Management Perspectives. Forthcoming
- Karlsson, C., & Åhlström, P. (1995). Change processes towards lean production: The role of the remuneration system. *International Journal of Operations & Production Management*, 15(11), 80–99. <https://doi.org/10.1108/01443579510102918>
- Ketokivi, M., & Choi, T. Y. (2014). Renaissance of case research as a scientific method. *Journal of Operations Management*, 32(5), 232–240. <https://doi.org/10.1016/j.jom.2014.03.004>
- Klerkx, L., & Leeuwis, C. (2008). Delegation of authority in research funding to networks: Experiences with a multiple goal

- boundary organization. *Science and Public Policy*, 35(3), 183–196. <https://doi.org/10.3152/030234208X299053>
- Kotter, J. P. (1995). Leading change: Why transformational efforts fail. *Harvard Business Review*, 73(2), 59–67.
- Lambert, D. M., Emmelhainz, M. A., & Gardner, J. T. (1999). Building successful logistics partnerships. *Journal of Business Logistics*, 20(1), 165–181.
- Logistar. (2020). What is Logistar. Retrieved January 13, 2020. https://logistar-project.eu/?page_id=3004
- Luecke, R. (2003). *Managing change and transition*. Harvard Business School Press.
- McCarter, M. W., & Kamal, D. F. (2013). Recognizing and resolving social dilemmas in supply chain public-private partnerships. *Journal of Business Logistics*, 34(4), 360–372. <https://doi.org/10.1111/jbl.12033>
- McKinnon, A. (2018). *Decarbonizing logistics: Distributing goods in a low carbon world* (1st ed.). Kogan Page Limited.
- Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). Defining supply chain management. *Journal of Business Logistics*, 22(2), 1–25. <https://doi.org/10.1002/j.2158-1592.2001.tb00001.x>
- Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, 83(2), 340–363. <https://doi.org/10.1086/226550>
- Mindel, V., Mathiassen, L., & Rai, A. (2018). The sustainability of polycentric information commons. *MIS Quarterly*, 42(2), 607–631. <https://doi.org/10.25300/MISQ/2018/14015>
- Mitnick, B. M. (1975). The theory of agency: A framework [SSRN]. University of Pittsburgh. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1021642
- Nguyen, Q., & Kim, T. H. (2019). Promoting adoption of management practices from the outside: Insights from a randomized field experiment. *Journal of Operations Management*, 65(1), 48–61. <https://doi.org/10.1016/j.jom.2018.11.001>
- Ostrom, E. (1990). *Governing the commons*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511807763>
- Ostrom, E. (2000). Collective action and the evolution of social norms. *Journal of Economic Perspectives*, 14(3), 137–158. <https://doi.org/10.1257/jep.14.3.137>
- Ostrom, E. (2010). Beyond markets and states: Polycentric governance of complex economic systems. *American Economic Review*, 100(3), 641–672. <https://doi.org/10.1257/aer.100.3.641>
- Ouchi, W. G. (1979). A conceptual framework for the design of organizational control mechanism. *Management Science*, 25(9), 833–848. <https://doi.org/10.1287/mnsc.25.9.833>
- Palmer, A., & McKinnon, A. C. (2011). *An analysis of the opportunities for improving transport efficiency through multi-lateral collaboration in FMCG supply chains*. LRN.
- Pan, S., Ballot, E., & Fontane, F. (2013). The reduction of greenhouse gas emissions from freight transport by pooling supply chains. *International Journal of Production Economics*, 143(1), 86–94. <https://doi.org/10.1016/j.ijpe.2010.10.023>
- Pomponi, F., Fratocchi, L., & Tafuri, S. R. (2015). Trust development and horizontal collaboration in logistics: A theory based evolutionary framework. *Supply Chain Management: An International Journal*, 20(1), 83–97. <https://doi.org/10.1108/SCM-02-2014-0078>
- Poteete, A. R., Janssen, M. A., & Ostrom, E. (2010). *Working together: Collective action, the commons, and multiple methods in practice*. Princeton University Press. <https://doi.org/10.1515/9781400835157>
- Quarshie, A. M., & Leuschner, R. (2020). Interorganizational interaction in disaster response networks: A government perspective. *Journal of Supply Chain Management*, 56(3), 3–25. <https://doi.org/10.1111/jscm.12225>
- Rafferty, A. E., Jimmieson, N. L., & Armenakis, A. A. (2013). Change readiness: A multilevel review. *Journal of Management*, 39(1), 110–135. <https://doi.org/10.1177/0149206312457417>
- Ralston, P. M., Richey, G. R., & Grawe, S. J. (2017). The past and future of supply chain collaboration: A literature synthesis and call for research. *International Journal of Logistics Management*, 28(2), 508–530. <https://doi.org/10.1108/IJLM-09-2015-0175>
- Rasmussen, E., & Gulbrandsen, M. (2012). Government support programmes to promote academic entrepreneurship: A principal-agent perspective. *European Planning Studies*, 20(4), 527–546. <https://doi.org/10.1080/09654313.2012.665035>
- Saenz, M. J., Gupta, R. & Connor, M. (2017). Finding profit in horizontal collaboration. Supply chain management review. https://www.scmr.com/article/finding_profit_in_horizontal_collaboration
- Sheffi, Y. (2018). Sustainability in practice. *Journal of Business Logistics*, 39(3), 160–163. <https://doi.org/10.1111/jbl.12193>
- Snell, S. A. (1992). Control theory in strategic human resource management: The mediating effect of administrative information. *Academy of Management Journal*, 35(2), 292–327.
- Tang, S. Y., Callahan, R. F., & Pisano, M. (2014). Using common-pool resource principles to design local government fiscal sustainability. *Public Administration Review*, 74(6), 791–803. <https://doi.org/10.1111/puar.12273>
- Transportation Data and Analytics Office. (2018). *Truck empty Backhaul report*. Florida Department of Transport.
- Vanovermeire, C., Sörensen, K., van Breedam, A., Vannieuwenhuysse, B., & Verstrepren, S. (2014). Horizontal logistics collaboration: Decreasing costs through flexibility and an adequate cost allocation strategy. *International Journal of Logistics: Research and Applications*, 17(4), 339–355. <https://doi.org/10.1080/13675567.2013.865719>
- Voss, C., Tsikriktsis, N., & Frohlich, M. (2002). Case research in operations management. *International Journal of Operations & Production Management*, 22(2), 195–219. <https://doi.org/10.1108/01443570210414329>
- Walsh, P. (2019). *Backhaul pilot project aims to reduce empty trucks on the road*. Food Marketing Institute.
- Whipple, J. M., & Frankel, R. (2000). Strategic alliance success factors. *Journal of Supply Chain Management*, 36(3), 21–28. <https://doi.org/10.1111/j.1745-493X.2000.tb00248.x>
- Whipple, J. M., & Roh, J. (2010). Agency theory and quality fade in buyer-supplier relationships. *The International Journal of Logistics Management*, 21(3), 338–352. <https://doi.org/10.1108/09574091011089781>
- Wilhelm, M. M. (2011). Managing cooptation through horizontal supply chain relations: Linking dyadic and network levels of analysis. *Journal of Operations Management*, 29(7), 663–676. <https://doi.org/10.1016/j.jom.2011.03.003>
- Wilhelm, M. M., Blome, C., Bhakoo, V., & Paulraj, A. (2016). Sustainability in multi-tier supply chains: Understanding the

- double agency role of the first-tier supplier. *Journal of Operations Management*, 41(1), 42–60. <https://doi.org/10.1016/j.jom.2015.11.001>
- Wisner, J. D., Tan, K.-C., & Leong, G. K. (2018). *Principles of supply chain management: A balanced approach* (Fifth Edition ed.). Cengage Learning.
- Wu, Z., & Choi, T. Y. (2005). Supplier–supplier relationships in the buyer–supplier triad: Building theories from eight case studies. *Journal of Operations Management*, 24(1), 27–52. <https://doi.org/10.1016/j.jom.2005.02.001>
- Yin, R. K. (2018). *Case study research and applications—Design and methods* (Sixth edition ed.). Sage Publications.
- Zsidisin, G. A., & Smith, M. E. (2005). Managing supply risk with early supplier involvement: A case study and research propositions. *Journal of Supply Chain Management*, 41(4), 44–57. <https://doi.org/10.1111/j.1745-493X.2005.04104005.x>
- 2.5 Was there a mandate or a goal for the project? Who created the mandate? Were there different goals for different participants?
 - 2.6 Did the members share similar beliefs about the project? (For example, did all members think that collaboration was a good thing, or were there different views depending on the hierarchical level of the participant within their company?)
 - 2.7 How was the relationship between the participants?
 - 2.8 Why did the collaboration project not go to implementation? List major reasons.
 - 2.9 Is there anything that you would have done differently?
3. Potential Outcomes—Net Cost–Benefits/Outcome Control/Monitoring
 - 3.1 How was the progress of the project controlled and evaluated?
 - 3.2 How do you think this project fit with your career at that point in time? What were the benefits of participating in that project?
 - 3.3 What future benefits did you anticipate you would achieve by participating in the project?
 - 3.4 Was it the only project that you were participating at this time?
 - 3.5 What were the incentives for the companies to participate?
 4. Actions—Information/Control/Behavior Control
 - 4.1 Did you participate in the meetings during the projects? Who participated in the meetings? What happened at those meetings?
 - 4.2 What process did the project follow? Who decided how to conduct the project?
 - 4.3 What level of effort did you perceive you put in this project?
 - 4.4 Was there trust among participants? If no trust, what actions were taken to improve the situation?
 5. Social Control/Proportional Equivalence/Collective Choice
 - 5.1 Did you follow up on the progress of the project?
 - 5.2 Did you perceive the participants hold each other accountable to progress with the project?
 - 5.3 What was the general agreement about the project?
 6. Risk Perception—Framing
 - 6.1 Did the shippers have experience in related projects of outside collaboration?
 - 6.2 What do you think hold the companies back to implement the project?
 - 6.3 Was this a risky project for you?

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

How to cite this article: Sternberg, H., Linan, I., Prockl, G., & Norrman, A. (2022). Tragedy of the facilitated commons: A multiple-case study of failure in systematic horizontal logistics collaboration. *Journal of Supply Chain Management*, 58(4), 30–57. <https://doi.org/10.1111/jscm.12278>

APPENDIX A: INTERVIEW GUIDE

Interview protocol

1. Respondent information:
 - 1.1 Organization during the project
 - 1.2 Position within that organization
 - 1.3 Prior experience related to the position (years, functions performed, etc.)
 - 1.4 Contact information for follow-up interviews
2. Actors/Agents and Principals/Positions—Input Control
 - 2.1 When did the project start, how did it start, how was the project funded/sponsored/who paid for the project, who paid/financed for the facilitator salary?
 - 2.2 How were you selected to participate in the project?
 - 2.3 How was the facilitator selected?
 - 2.4 What were your vision and driving force for the project?

- 6.4 Do you think the other participants perceived risks with this project? What if it started and failed?
7. Other factors—External/Contingency
 - 7.1 Relationships between the actors (old/new, strong competitors or not, etc.)
 - 7.2 Anything you would like to add?

APPENDIX B: CODING PROCESS

In this appendix, we outline our coding process as follows:

1. We analyzed the literature of commons theory and agency theory and found relevant concepts from each. Among other works, for example, we used Ostrom (2000) and Mindel et al. (2018) for informing commons theory and Eisenhardt (1989a) and Zsidisin and Smith (2005) for informing agency theory. We considered two frameworks for commons theory (action-situation and polycentric tenets) and one for agency theory (input–output-behavior-social control).
2. We created a coding book that consisted of an extended table of codes for four elements: the category code, the name of the code, the definition, and a representative example of the code.
3. We tested the coding book twice with 5 min worth of transcripts. We realized an overlap in some of the concepts of commons theory and agency theory (for example, the *actors* concept in commons theory overlapped with the *skills* concept in agency theory). Such overlap created discrepancies in coding.
4. We analyzed the codes, comparing their meanings and their application to our research question. We grouped the codes in nonoverlapping categories to be able to merge them for the coding and still be able to separate them for further analysis. Consequently, we developed

five categories: (1) *Actor–situation* described the background, the context, and the skills of the actors. (2) *Incentives and beliefs* gathered information about the actors' objectives and principles. (3) *Information* focused on comments related to the data used or required in the projects. (4) *Behavior* considered the level of autonomy and control the actors had in taking actions. (5) *Social* gathered information about common attributes among the actors, such as goal congruence, trust, and shared beliefs and values. We tested the coding scheme twice with 5–10 min of text, which resulted in better coding alignment between the coders. Guiding examples from the coding tests were recorded in the coding book to serve as a reference for the coding exercise. The codes allowed us to gather data from the transcripts and informed our selected theories.

5. Two researchers proceeded to code half of the interviews following the last version of the coding book. After one interview was completed, the researchers compared the coding to discuss and solve disagreements. This helped with refining the definition of the codes.
6. After half the interviews were coded, one of the other two authors reviewed the results to evaluate the validity of the exercise. If the outside researcher was not convinced with the validity of the coding, the coders would modify that coding according to the feedback received.
7. The other half of the transcripts were coded by the main coders and subsequently reviewed by an external coder.

The final codes and the quotes were compiled and compared to understand the similarities and differences within and between the cases. We used the coding to develop the observations.

Category	Code	Definition	Example
1. Actor–situation	Actors description	Identity of the actor, project position, background Details about who was and was not included Relative size of the actor Position of the actor—principal or agent Role of the actors (main activities)	“We were the consultants (...), those are the managers and the companies, the inner core.” “Only shippers were included.” “We went to the participated companies to see what kind of transport do they need, and we try to mix cargoes and transport with other companies.”
	Skills	The capabilities the actor possesses Ability or inability to complete tasks The added value the actor brings to the project Individual or group skills (analyzed again after the project) Handicaps attributable to actors	“We solved problems.” “He wanted to grow the business ... but he was not successful on that area.” “They had a small solution already in place.” “They were really weak.” “We couldn’t find right solutions, right partners.”
2. Incentives & beliefs	Incentives and goals	Extrinsic motivation of the actors Objectives and measurable goals that drive the actors’ behaviors Project goal Data calculation objective	“He wanted to grow the business.” “There was a promise in the room to get a larger grant.” “Reduce cost” “The main idea behind the project was to see how collaboration can make companies utilize their transport capacities more efficiently.”
	Values and beliefs	Intrinsic motivation of the actors Risk preferences Actions that express actors’ propensity to initiate actions, such as investing in changing their business Expectations regarding the project, savings, or outcomes (Did they expect to save a lot?) Evaluation cost–benefit subjective	“He was very ambitious.” “They have not been willing to invest in something.” “Conservative” “Firms thought the project was too theoretical.” “I just wanted to do it, it was the biggest study I’ve ever done.” “Focus on customer service.” “Beverage producer 1 and Beverage producer 2 said no, we are not going to collaborate.”
3. Information	Information	Data required in the project (data types) Data available to actors to evaluate/make decisions (How much? Available or not?) Data clarity, transparency, and completion Any other info that does not fit in the above boxes	“We needed to do calculations, and we need to do some simulations.” “We did not know they were already collaborating.” “Denmark is a pretty small country, so it is hard to figure out how volumes of a different nature can be put together.”
4. Behavior	Autonomy	What actors could and could not do Did the actors need permission of other members to do something? What permissions did they need to proceed with actions? Was there any control among actors’ actions?	Anticompetition laws: “We did not want to get into funky business.” (External) “Say we never met managing directors or higher level authorities in the companies.” (Internal)
5. Social group control	Goal congruence	Alignment of incentives and goals among actors Evaluate or quantify	An extra step after comparing the goals of each participant.

(Continues)

Category	Code	Definition	Example
	Trust	Effective: the shared believe that the other actors are reliable, would act in the other actors' best interest, and would not act opportunistically (Morgan & Hunt, 1994; Sako, 1992)	"I think this was more personal, and maybe a regional relationship caused that."
	Shared values and beliefs	Congruence among the actors' values and beliefs	"The forwarding companies didn't like to give us the data."

CODE: (*frameworks: Actor-Situation = AS; Poly-centric tenets = PT; Agency = AG)

1. Actors
 - a. Actor **characteristics**: AS-Actor & PT-Boundaries AS-Position (size, role, background)
 - b. AG-**Skills** (personal capabilities, value added, lack of it, evaluation, and disclosure)
2. Incentives & Beliefs
 - a. AG-Personal/firm **incentives**/motives + one actor's (participant's) specific goals/aims
 - b. AG-Personal/firm **values** and beliefs (believe in fairness, competition, collaboration ...)
 - c. AG-**Risk** preferences + Risk exposure (risk seeking/avoidance, only project, concern about competition ...)
 - d. AG-**Overall goal**, project mandate
 - e. AG-Output control (principal controls progress of project, goal is met in time)
 - f. Outcomes & **cost and benefits** AS-Potential Outcomes + Cost and Benefits + PT-Proportional equivalence between input output for one actor.
- g. AG-**Outcome uncertainty** (Was it clear that they could reach the goal?)
3. Information
 - a. AS-**Information** (information available to the actor)
4. Behavior
 - a. AS-**Action**—*if it in some way work toward a change of any of the other codes*
 - b. AG-**Programmability** (appropriate behaviors can be specified in advance?)
 - c. Actor **Autonomy**: AS-Controls (Do actors need permits for actions?); PP- Nested enterprise; PT-Self-determination; PT-Collective choice arrangement (affected individuals provide input)
 - d. AG-Behavior control (How do the principals control how things are done?)
 - e. AG-Moral hazards (level of **effort** to meet principal requirements)
5. Social
 - a. AG-Goal Congruence
 - b. AG-Trust
 - c. AG-Shared values and beliefs