Making agency theory work for supply chain relationships: a systematic review across four disciplines

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Abstract

Purpose – Contemporary supply chain relationships inherently rely on delegation of work between organizations and, thus, are subject to agency problems for which a wide range of governance mechanisms exist. This review of agency theory (AT), across four distinct fields, explains the connection between governance mechanisms and supply chain relationship types.

Design/methodology/approach – The study uses a systematic literature review (SLR) of articles using AT in a supply chain context from the operations and supply chain management, general management, marketing, and economics fields.

Findings – The authors categorize the governance mechanisms identified to create a typology of agency relationships in supply chains.

Research limitations/implications – The developed typology provides parsimonious theory on different forms of supply chain agency relationships and takes a step towards a "supply chain-oriented agency theory" explaining and predicting relationship types and governance in supply chains. Furthermore, a future research agenda calls for more accurate measuring of agency costs, to examine residual gains alongside residual losses, to take a dual-sided perspective of agency relations and to adopt AT to examine more complex supply networks.

Practical implications – The review provides a menu of governance mechanisms and describes situations under which these mechanisms could be deployed to guide managers when developing their supply chain relationships.

Originality/value – The first review to combine and elaborate views from four major disciplines using AT as a lens to supply chain relationships. Expanding the traditional set of governance mechanisms provides academics and practitioners with a bigger "menu" of options to consider.

Keywords Agency theory, Information asymmetry, Supply chain relationships, Buyer-supplier relationships, Systematic literature review

Paper type Research paper

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1. Introduction

Over the last decades, we have witnessed increasing supply chain complexity as firms seek improvements in their competitive advantage through the delegation of activities to partners with specialized knowledge, resources, and capabilities. These supply chain relationships take various forms such as transactional buyer-supplier relations, strategic partnerships, service triads, alliances, and distribution channel relations. However, the common denominator is that they involve two or more independent organizations with individual goals and incomplete transparency of one another's operations (Gibbons, 2005; Vosooghidizaji *et al.*, 2020). In theoretical terms, such relations are subject to *agency problems,* namely the self-interest of the other party (typically the agent), which creates incentive design and monitoring (i.e. *governance*) challenges (Lassar and Kerr, 1996).

Let us consider a typical supply chain relationship: a buyer-supplier relationship. Here, the buying firm (the principal) has access to a market but requires the capabilities of a supplier (the agent) to fully claim the market's value. This creates two generic categories of agency problems resulting from asymmetric information and potential goal incongruence between the parties (Zu and Kaynak, 2012): (1) *adverse selection* due to the supplier's unknown capabilities before signing the contract *ex ante*, and (2) *moral hazard* due to the supplier's hidden action after signing the contract *ex post*. As such, parties must agree on a contract monetarily aligning goals and defining responsibilities, but contracts are often incomplete and should be complemented with governance and coordination mechanisms such as monitoring, shared practices, and social contracts (Malhotra and Lumineau, 2011).

Given the fact that formal and informal governance and coordination mechanisms are the cornerstones of effective supply chain management (Cao and Lumineau, 2015), it is perhaps surprising that agency theory (AT) has remained a relatively underutilized lens in operations and supply chain management (OSCM) when compared to other mainstream theories such as transaction cost economics (TCE). AT's advantage is that it analytically focuses on the *relationship* between two asymmetrically informed parties (Barney and Hesterly, 2006) rather than proxies such as transactions, as in TCE.

So, what explains such under-utilization of AT in OSCM as well as more generally in literature on inter-organizational relationships (IORs)? In their review, Fayezi *et al.* (2012) point out that OSCM scholars have predominantly relied on so called positivist agency theory (PAT), which is widely used to examine the relationship between firm's owners and managers, i.e. corporate governance (Barney and Hesterly, 2006; Eisenhardt, 1989), hence limiting the wider utilization of the theory in a supply chain context. Moreover, AT has been criticized due to its narrow model of human behaviour and excessive focus on self-interest and opportunism (Bosse and Philips, 2016), which tend not to fit well with the relational perspective in OSCM (see, e.g. Lumineau and Oliveira, 2020).

Whatever the reasons, we argue for a more in-depth examination of the past use and fit of AT to study supply chain relationships, and for a synthesisation of governance mechanisms and different types of relations. Therefore, our paper seeks to address the following research question: How can agency theory explain and predict types of supply chain relationships (both downstream and upstream) and their governance? More specifically, we examine the extent to which the key components of AT explain various relationship forms but also address potential weaknesses of the theory that would benefit from further elaboration. In doing so, we make several important contributions.

First, we provide a systematic literature review (Durach *et al.*, 2017) of the use of agency theory in studies of supply chain relationships. Critically, we spanned our search across four key disciplines – OSCM, general management (MGMT), marketing (MARK), and economics (ECON) – to identify potential similarities and divergent perspectives. This inter-disciplinary approach, the first of its kind, is an important contribution as recognizing relevant research across disciplines is key to theory development and understanding complex phenomena

(Tanskanen *et al.*, 2017), thereby ensuring the OSCM can address current and future challenges (Sanders *et al.*, 2013). This multi-disciplinary approach, capturing in essence leading studies on agency relationships in inter-organizational contexts, whether they are labelled as supply chain management or not, also enables us to significantly expand the earlier review efforts of Fayezi *et al.* (2012). We thus include papers covering all supply chain agency relationship settings, including upstream buyer-supplier relations, downstream distributing relations, horizontal alliances, as well as those beyond the dyad such as triadic agency settings or those with multiple agents working for a single principal.

Second, based on integration of past literature across the four disciplines, we have categorized fourteen key governance mechanisms aimed at curbing agency problems (further clustered into four dimensions). In doing so, we evidence a more extensive and fine-grained set of mechanisms than the monitoring and incentives that have dominated traditional discourse since Eisenhardt's (1989) seminal article. This integration across the four neighbouring disciplines aims to unify the discussion on AT and supply chain relations, linking so far somewhat disconnected discussions across different disciplines.

Third, we develop a typology of supply chain agency relationships that together with a set of propositions provides a clear linkage between governance mechanisms and different relationship types. We show that agency risk, defined as probability multiplied by impact, is a key concept explaining the viability of different relationship types. This enables both a coherent theoretical discussion as well as a better managerial understanding of which governance mechanisms are best suited under which condition.

Finally, we provide an agenda for future research, calling for better operationalization of agency costs; further exploration of residual *gains* alongside traditional residual *losses*; dyadic analysis of agency problems that incorporates principal *and* agent perspectives; and using AT as a lens to explore more complex supply networks (e.g. triads, agency chains, common agency, dynamic agency roles) in contemporary OSCM contexts, with a particular focus on sustainability and digitalisation agendas. In doing so, we take an important step towards a "supply chain-oriented agency theory" and suggest empirical approaches to investigate previously overlooked areas. We hope that our work will make agency theory more accessible to OSCM researchers as well as representatives of neighbouring disciplines studying supply chain related topics.

2. Methods and materials

This section first describes the theoretical premises behind our methodological choices. After this, we provide a detailed description of the methods used to retrieve and analyse an appropriate sample of AT articles focusing on supply chain relationships and the approach to subsequent analysis.

2.1 Theoretical premises

A successful integration of existing research via systematic literature review (SLR) requires strong *a priori* theoretical guidance in the development of research questions and subsequent SLR process (Durach *et al.*, 2017). Hence, our premises are derived from AT's core assumptions on information asymmetry, goal incongruence between parties, as well as portraying actors as rational and self-interested decision-makers. This does not mean that we are blindly restricted by these assumptions, but they serve as boundary conditions to better manage our SLR process, e.g. by restricting our inquiry to those papers using only AT as a predominant theory.

First, we use the agency relationship as our unit of analysis, which encompasses the contract but takes a broader perspective to the relationship between the principal and the agent. While for example Eisenhardt (1989, p. 58) defines the contract governing the relationship between the

principal and agent as the unit of analysis, she, as well as other key AT references (Ross, 1973; Jensen and Meckling, 1976; Barney and Hesterley, 2006) explicitly explain the theory as directed at the *agency relationship*. Eisenhardt herself (1989, p. 58) notes how "agency theory attempts to describe this relationship using the metaphor of a contract", suggesting the theory has a broader scope and the contract is only (an empirical) proxy. As Jensen and Meckling (1976) note, the contractual arrangements are only a small part of the general agency problem and associated costs, and the theory has been extended to many different relationship types (Barney and Hesterly, 2006). Additionally, a contract to economists is a complex optimization problem to derive optimal compensation structure, which is far removed from the term's common usage as a legal document. Indeed, our review results indicate the de facto unit when using agency theory in supply chain relationships is often the relationship, not only (or not even) the contract. This is also in line with our analysis relying on the core assumptions of information asymmetry and goal incongruence, which are related to, but extend beyond the contract.

Secondly, from an analytical perspective, we focus on a hypothetical *focal firm* in the supply chain to describe agency relations in *all* directions, upstream, downstream, and horizontal. We also included all agency relationships studied whether in a dyad, triad or a more complex network. The analytical focus simply means that to generalize the findings, we use the focal firm perspective, which we take as the principal having relationships in many directions. This assumption deviates from some of the former conceptualizations of agency relationships in supply chains, which tend to narrowly treat the downstream party as the principal (cf. Figure 3 in Fayezi *et al.*, 2012).

2.2 Systematic literature review process

To control for research quality in epistemologically diverse management research, limiting searches to top field journals has become a standard practice in management reviews (Tranfield *et al.*, 2003; Durach *et al.*, 2017). Hence, we systematically reviewed leading journals in the selected disciplines based on the criteria that the journal is either listed in the University of Dallas (UTD) journal list or has ranking of four (or four star) in the Academic Journal Guide (AJG) by Chartered Association of Business Schools (CABS) [1]. In total, we searched 26 journals for supply chain-oriented agency theory articles. In ECON, we chose only four-star journals given that there are over 20 four or four-star journals (we also excluded *Annals of Statistics* which is an outlet for statistical methods development). We included *Management Science* and *Operations Research* within the OSCM group of journals since they both are listed in UTD journal list (without any specific discipline label but alongside with OSCM journals) and share strong intellectual legacy between two major OSCM outlets of *Manufacturing and Service Operations* and *Production and Operations Management*, albeit in AJG they are placed in their own field.

2.2.1 Article retrieval. We searched the 26 journals (title-keyword-abstract) using four major databases (Web of Science, EBSCO Business Source Complete, ABI/INFORM, and Scopus) from the start of the journal until the end of 2021 by using a generic AT-related search string (*"agency theory"* OR *"principal agent"* OR *"agen* problem"* OR *"agen* relation*"*). By doing this, we sought to retrieve all articles from the selected journals, which would use AT as a predominant theoretical lens. After merging the results and removing duplicates, we were left with 1,259 articles for manual abstract screening.

Next, we included only articles explicitly discussing any organization-to-organization relationships which could inform us on agency problems (and their mitigation) that a focal firm faces in a supply chain context (excluding, e.g. corporate governance articles). We saw this manual selection as the only option given the fact that different disciplines discuss supply chain type of relations using different terms such as inter-organizational relationships, franchising relations, buyer-supplier relationships, etc.

Two independent evaluators conducted abstract screening utilizing a traffic light approach (red = excluded, yellow = unsure, green = included). All articles receiving a

disputed decision were discussed to reach a unanimous decision. This resulted in 76 articles being accepted, 1,006 articles being rejected, and 177 unsure articles passed for a further full text review to assess their suitability. The full text review of the yellow cases by the two evaluators led to the inclusion of an additional 36 articles. While reviewing the full-text of the included sample, we discarded 17 initially green-listed articles as "false positives" not meeting the criteria of being explicitly focusing on supply chain context and using AT as a predominant theory, leaving the *final sample* of 95 articles.

2.2.2 Analysis and coding. Four researchers engaged in a rigorous three-stage coding process preceded by a pilot coding. In the pilot coding, we jointly crafted an initial coding scheme and instructions with which each researcher coded the same two articles from each field independently (in total 8 articles). After this, the coding results were compared, and coding scheme and instructions were further developed to mitigate any discrepancies.

In the actual three-stage coding, the sample was divided among four researchers so that each researcher coded articles belonging to a certain discipline. In the first round, we coded all the research design related matters such as research question, research approach, method, study context and data. Related to the study objectives, we also coded the type and direction of the relationship, supporting and complementary theories used, and identified the principal and the agent (if clear) in each relationship.

In the second, and more extensive round, we focused on the explicit results of each paper. We coded the concepts discussed in each paper as well as their operationalization (i.e. variables) together with the claimed and tested relationships. We also focused more on coding categories specifically related to AT, such as agency problems, agency costs, and governance mechanisms, described in the papers as well as the papers' contributions.

The third and final round of coding aimed to identify categories of governance mechanisms used to curb agency problems. In order to generate a reasonable number of categories while maintaining the richness of the material, we undertook inductive categorization resembling qualitative data analysis (Gioia *et al.*, 2013). During the previous coding stage, we had listed the governance mechanisms using the specific language of each article. At this stage, we moved up the ladder of abstraction by identifying common patterns. After several iterations, we categorized fourteen key governance mechanisms, which we further aggregated into four distinctive dimensions. These categories and aggregate dimensions formed a basis for our further theorizing efforts and formulation of our supply chain agency relationship typology.

3. Summary of synthesis sample – similarities and differences between disciplines

Even a high-level analysis of our synthesis sample reveals an interesting finding: there appears to be both *within-discipline* and *between-discipline* variation in terms of research approaches. More specifically, our synthesis sample containing the four disciplines seems to be separated by the classic dichotomy between more empirical *positivist agency theory* and more mathematical *principal-agent research* (Eisenhardt, 1989). Roughly speaking, general management, marketing and so called "empirical operations management" tend to follow the former tradition while economics and operations research (here treated as part of OSCM discipline) follow the latter. Table 1 [2], summarizing the relationship types and employed methods, captures this variation. In the following, we provide a short synthesis of the key differences between these two distinctive domains with particular focus on principal-agent research, which is arguably less familiar to the empirical OSCM readership.

3.1 Positivist agency theory versus principal-agent research

According to Eisenhardt's original formulation (1989), positivist agency theory tends to focus on governance mechanisms aimed at curbing self-interested behaviour of agents especially in

	OSCM	MGMT	MARK	ECON	Total
Papers in total	51	17	17	10	95
Relationship types					
Buyer-supplier	36 (71%)	6 (35%)	3 (18%)	8 (80%)	53 (56%)
Franchisor-franchisee	5 (10%)	6 (35%)	7 (41%)	1 (10%)	19 (20%)
Manufacturer-distributor	3 (6%)	1 (6%)	5 (29%)	1 (10%)	10 (11%)
Payor-provider	5 (10%)	N/A	N/A	N/A	5 (5%)
Alliance/network	N/A	2 (12%)	1 (6%)	N/A	3 (3%)
Various/generic	1 (2%)	2 (12%)	N/A	N/A	3 (3%)
Licensor-licensee	1 (2%)	N/A	1 (6%)	N/A	2 (2%)
Methods					
Secondary data	6 (12%)	6 (35%)	6 (35%)	3 (30%)	20 (21%)
Survey	7 (14%)	1 (6%)	8 (47%)	N/A	16 (17%)
Mixed-methods	3 (6%)	1 (6%)	N/A	N/A	4 (4%)
Case study	6 (12%)	1 (6%)	1 (6%)	N/A	8 (8%)
Experiment	1 (2%)	N/A	N/A	N/A	1 (1%)
Modelling	25 (49%)	2 (12%)	1 (6%)	7 (70%)	35 (37%)
Review	3 (6%)	6 (35%)	1 (6%)	N/A	10 (11%)

Note(s): *Percentages refer to the "papers in total" in each field or in total sample (the leftmost column)

Table 1.
Relationship types and methods per discipline and sample in total

intra-organizational corporate governance. Our review reveals a similar tradition for the *inter-organizational* context in the disciplines of MGMT, MARK and empirical OSCM. As the subsequent sections of this paper show, past research has explored a wide range of different governance mechanisms in various relationship types (see also Table 1). However, whilst the traditional dichotomy between outcome-based and behaviour-based mechanisms holds, these have increasingly been combined and complemented with more informal approaches (see, e.g. Rivera-Santos *et al.*, 2017; Wilhelm *et al.*, 2016) summarized in Section 4 of this paper.

In contrast, principal-agent research does not explicitly focus on any "real-world" governance mechanisms but analyses the economic contract between a principal and an agent. Thus, in economics, agency theory is often referred to as *contract theory* (Bolton and Dewatripont, 2004) or *theory of incentives* (Laffont and Martimort, 2002). The economic contract is not a contract in legal terms, but simply a compensation scheme under asymmetric information and typically formulated as a set of complicated mathematical equations (Bolton and Dewatripont, 2004). *Adverse selection* and *moral hazard* are then used as analytical frameworks to build on a game theoretic set up, where the principal and the agent take turns choosing certain game parameters to optimize their utility functions. Information asymmetry makes it impossible for the principal to deduce the optimal contract, forming the so called "principal's problem" (Ross, 1973). The following simplified example illustrates the issue.

Let's assume that a car manufacturer (the principal) needs to buy a specific component from its supplier. If the buyer knows the supplier's production cost C and this would also be the supplier's reservation utility (i.e. the price a supplier could achieve elsewhere), the buyer can simply offer the supplier a contract with a price of $C + 1$, that makes the supplier "just indifferent" between selling the product to the given buyer or doing anything else. However, in a principal-agent framework (and often in real life), production cost information is *private* to the agent and, therefore, the principal does not know production costs and thus distinguish between an efficient (*high* type) and an inefficient (*low* type) agent. The extra profit gained by a high-type agent (having lower production costs) is called an *information rent* and is often treated as the minimization object in adverse selection models. Thus, while the agent's type remains unknown to the principal, there is no first-best solution to the principal's problem,

which means that the agent's information rent is always higher than zero (leading to an informational advantage for the agent). The common principal strategy is to formulate a menu of *screening contracts* from which the agent chooses. The crux is to decide a menu of contracts whereby the agent's contract selection reveals their type – referred to as the *information revelation principle*.

Similarly, in moral hazard models, the principal designs a compensation structure that captures their marginal benefits and the agent's marginal costs, to incentivize the agent to induce highest effort *ex post* (see, e.g. Anderhub *et al.* (2002) for a generic illustration and experimental results).

The clear benefit of such models is that they are to some extent indifferent to initial parameters as well as the roles of the principal and the agent. The principal suffering from the information asymmetry can be the buyer not knowing about the supplier's delivery cost (see, e.g. Gao, 2015) but can also be the supplier not knowing the buyer's actual demand (e.g. Feng *et al.*, 2015; Gümüş, 2014). Thus, the task is simply determining the initial utility functions for both parties as well as the parameters of the task to be delegated and then to attain the mathematical solution which maximises either party's benefit (typically the principal's).

Unfortunately, more parameters, more complex models tend to become, involving higher order differential equations or other optimization techniques such as dynamic programming (see, e.g. Zhang and Zenios, 2008). Whilst intellectually appealing, such models oftentimes have limited practical value. Yet, such models are important starting points for more practical compensation structures and policies and therefore more recently even the most complicated models are often backed up at least by numerical examples (see, e.g. Liang and Atkins, 2021) or even real data (see, e.g. Iyer and Palsule-Desai, 2019; Aswani *et al.*, 2019).

To summarize, positivist agency theory dominates empirical papers and is perhaps the most familiar to an empirical OSCM readership (see, e.g. Fayezi *et al.*, 2012). Yet, there is significant research adopting a principal-agent framework, utilizing economic contract theory, to the supply chain context. The common denominator lies in the assumptions of information asymmetry and goal incongruence between principal and agent. However, beyond this, the two streams have developed as relatively isolated pockets. Interestingly, OSCM seems to be the domain where potential cross-fertilization could occur. For instance, we often see also pure modelling papers published in journals also focusing on empirical research. For instance, *Production and Operations Management* has published papers belonging to both streams (for principal-agent research see, e.g. Chen *et al.*, 2014; Gao, 2015; Gümüş, 2014; Dong *et al.*, 2016 and for the positivist stream see Handley and Gray, 2013).

3.2 Relationship types

As indicated in Table 1, the dominant relationship in OSCM and ECON form is *buyer-supplier relationships* (BSRs) with the buyer typically assumed to be the principal. In MARK and MGMT, franchising is the most common relationship type. It is noteworthy, but unsurprising, that the downstream relations (franchising and manufacturer-distributor) comprise over 60% of the marketing papers as the discipline often emphasizes management of marketing channel relations. Payor-provider relationships in healthcare provide an interesting and seemingly trending special case in OSCM field appearing in five articles (of which three articles appeared after 2019). Alliances and other networked forms (3 articles) and more specific licensor-licensee relationships (2 articles) remain relatively marginal. Three remaining articles were conceptual articles that did not define a specific relationship type or discussed multiple types organization-to-organization relationships.

While agency theory is geared at the dyadic principal-agent relationship, in reality, such supply chain relationships take place in more complex networks where dyadic relationships are impacted by others in a network (Choi and Wu, 2009). It is thus important to also understand the extent to which this is reflected in the use of the theory. While most articles

focused on a dyadic relationship, examples of a triadic agency relationship were also found in relation to service triads in a buyer-supplier context (Broekhuis and Scholten, 2018), and in a franchising context (Zhang *et al.*, 2015).

Additionally, some studies examined a setting with a principal and competing agents (suppliers or distributors) (Seshadri, 1995; Board, 2011; Cremer and Kahlil, 1992; Segal and Whinston, 2003; Mookherjee and Tsumagari, 2004; Li *et al.*, 2013; Gümuş, 2014; Obloj and Zemsky, 2015; Homburg *et al.*, 2020; Vivian Zheng *et al.*, 2020; Liang and Atkins, 2021), competing principals with a single agent, i.e. common agency (Hu *et al.*, 2013; Kalkancı and Erhun, 2012) or an intermediary serving an upstream an a downstream principal (Lawrence *et al.*, 2021). Multi-tier agency relationship studies are rare, but examples in our sample include the empirical studies by Wilhelm *et al.* (2016) and Hasan *et al.* (2020), and modelling studies by Chen *et al.* (2014) and Dong *et al.* (2016).

3.3 Methods employed

Table 1 further reports the methods employed in the synthesis sample. Overall, articles are balanced between empirical and non-empirical articles. AT has claimed to be strongly positivistic and enjoys relatively strong theoretical maturity; hence it is unsurprising that all of the studies represent the positivist line of thought in terms of epistemology and ontology, i.e. empirical articles predominantly rely on theory testing using quantitative methods, either through surveys or secondary data. The predominant design in the non-empirical papers is mathematical modelling. There is also an increasing trend to utilize multiple methods (coded as multi-methods in Table 1), such as survey with secondary data experiments (Lawrence *et al.*, 2021), interviews with secondary statistical data (Peltokorpi *et al.*, 2020) or with simulations (Shevchenko *et al.*, 2020), or modelling with secondary data (Aswani *et al.*, 2019).

3.4 Units of analysis

As expected, the dominant unit of analysis is either the relationship between, or the (economic) contract between firms. However, this is rarely stated explicitly and the gap between the *analytical* and *empirical* unit of analysis can be quite wide. There is a prevalence of principal-sidedness in examining agency issues particularly apparent in the modelling papers and their two very basic principal-agent frameworks as described above. Arguably, one-sidedness is partly caused by the overly "principal-dominant" tenet of AT where information asymmetry is predominantly viewed as one-sided and something that only the principal suffers from.

The one-sided perspective is visible in designs of empirical papers, which typically focus on ensuring the principal's welfare, through contractual mechanisms such as franchising (Combs *et al.*, 2004) and performance-based contracts (Roels *et al.*, 2010; Seshadri, 1995; Zu and Kaynak, 2012). In a similar vein, empirical papers often focus on factors behind supplier opportunism and risk (Zsidisin and Smith, 2005) and mechanisms such as monitoring (Handley and Gray, 2013) and plural governance (Heide, 2003). Even if the data are collected from agents, the interest is often in the principal's welfare (e.g. Massimino and Lawrence, 2019). Furthermore, a strong majority of this empirical work involves data collection solely from the principal's perspective, yet the principal's role in the supply chain may vary (see, e.g. Lassar and Kerr, 1996, for a manufacturer/supplier as the principal; Shane, 1998a, for a franchisor as the principal; Shevchenko *et al.*, 2020, for a buyer as the principal).

Just a handful of studies have approached principal-agent issues purely from an *agent* perspective and focus on, e.g. agent's perceptions of employed coordination and incentive mechanisms (Celly and Frazier, 1996), forms of monitoring (Heide *et al.*, 2007), levels of goal congruence (Gilliland and Kim, 2014), and the customer's behaviour (Steinbach *et al.*, 2018). Overall, these studies posit that an agent performs more poorly when they face unfair treatment from the principal.

Some principal-agent papers focus on so called Pareto efficiencies, i.e. the optimal outcomes of the principal-agent relationship/system as a whole. For example, Corbett (2001) analyses the lot sizing problem from perspectives of both parties, Inderfurth *et al.* (2013) report on a laboratory experiment predicting the performance of the whole supply chain through the agent's (the supplier) choices based on the principal's (the buyer) signals, and Lawrence *et al.* (2021) provide insights for sellers, customers, and the sales agents in between in their dual agency role.

Finally, a very small set of studies achieve a stronger fit between analytical and empirical units of analysis. Examples of quantitative studies using dyadic data include Handley and Gray (2013), Lawrence *et al.* (2021), and Ross *et al.* (1997), whilst Sumo *et al.* (2016) use non-matched data from both parties. Likewise, qualitative studies in our sample interviewed representatives from both sides (e.g. Argyres, 1999; Broekhuis and Scholten, 2018; Wilhelm *et al.*, 2016).

3.5 Directionality of principal-agent relations in supply chain

One major difference between the four reviewed disciplines is the directionality of principal-agent relationships in the supply chain. By directionality, we mean upstream vs downstream positioning of the principal and the agent. In OSCM, the fundamental assumption is that the *upstream* supplier acts as the agent to the *downstream* buyer or the principal (Fayezi *et al.*, 2012; Slack and Brandon-Jones, 2021). In turn, the firm then takes an agent role when serving the next downstream firm in the chain.

However, given the different research foci, this assumption is reversed in other disciplines. For example, in MARK, analyses of channel relationships place the upstream manufacturer as a principal and the downstream distributor as an agent. A similar assumption holds for franchising relations. The rationale is that this time the downstream agent has an informational advantage in areas like market value (Chen *et al.*, 2014), how active it is in promoting and selling products (Celly and Frazier, 1996), how well it meets service standards in franchising (Massimo and Lawrence, 2019). This analogy could easily be applied to buyer-supplier relationships meaning that especially in situations of complex technologies, the buyer may act as an agent to the supplier, when (mis)using the supplier's components in its own manufacturing process and the supplier does not have sufficient information on the process. Naturally, an agency problem will occur only if the goals of the two parties are incongruent [3].

As stated above, the papers building on an economic principal-agent framework appear to be more flexible in these terms because they simply assign the P-A roles based on informational advantage which every self-interested economic actor is willing to use. Naturally, this assumption is debated, particularly in empirical work (see, e.g. Broekhuis and Scholten, 2018; Lassar and Kerr, 1996; Meuleman *et al.*, 2010). However, focusing only on information asymmetry allows using the same P-A framework for BSRs where either the supplier or buyer acts as an agent.

Taken together, these aspects support our theoretical premises and choice to focus on the focal firm as a principal. This choice further motivates our subsequent analysis in the next section where we discuss different governance mechanisms the focal firm can put in place to coordinate its supply chain agency relationships. Naturally, such theoretical parsimony comes with its limitations such as the aforementioned overly principal-oriented focus. We return to these limitations at the end of our paper as they open interesting avenues for future research.

4. Governance mechanisms

We identified 14 different types of governance mechanisms, which we have further aggregated into four distinct governance strategies: (1) *information transfer strategies*,

dedicated to decrease the level of private information (creating information asymmetry) between parties (2) *goal alignment strategies*, dedicated to curb self-interested behaviour through decreasing goal incongruence, (3) *integration strategies*, aiming to decrease both information asymmetry and goal incongruence, and (4) *psychological influence strategies*, involving social mechanisms mitigating self-interested behaviour. As a result of our systematic review, we are able to present a much richer set of governance mechanisms that goes beyond the commonly mentioned dichotomy of "incentives" and "monitoring". The result of this coding is shown in Figure 1.

In the following, we will explain each mechanism in detail which then leads to our formulation of a typology of supply chain agency relationships together with the set of propositions on conditions under which each relationship form is assumed to thrive. We assume that each supply chain relationship comprises of some kind of a formal agreement/contract between the parties defining their roles and responsibilities and therefore the identified governance mechanisms are seen as complements to such a baseline contract. For example, two organizations may enter into a baseline exchange agreement for a specific service which defines the basic characteristics and price paid. However, to mitigate agency problems, the principal may also put in place additional governance mechanisms, i.e. some of those introduced in the following.

4.1 Information transfer strategies

Most of the mechanisms grouped under this strategy rely on the principal's actions to acquire more information on either agent's skills or actions to decrease the opportunity for agency problems to occur. However, *signalling mechanism* also highlights the agent driven action to willingly (or selectively) share private information. Thus, the label *information transfer*, which aims to capture the ideal that reducing information asymmetry is essentially about transferring the information between two independent parties.

4.1.1 Screening. Many articles, especially in ECON, focus on screening contracts as a mechanism to mitigate adverse selection. Note that screening has a specific meaning in this context which differs from its more colloquial interpretation. Screening is based on the idea that the principal offers agents (who possess private information *ex ante* on their "type" such as production costs), a menu of contracts from which to choose (Laffont and Martimort, 2002; Iyer and Palsule-Desai, 2019). The principal can then *screen* the agents' type based on the

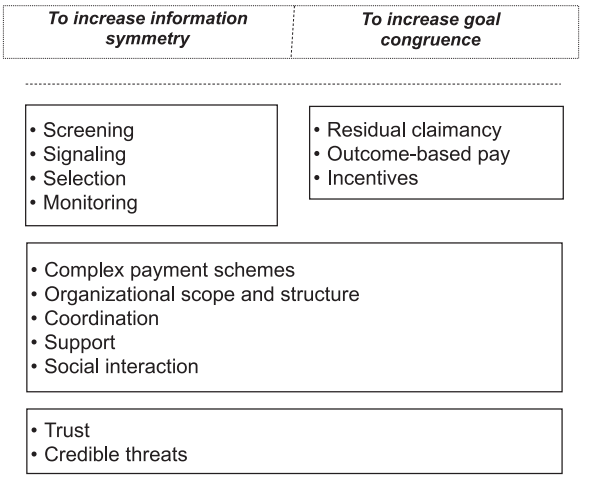

Figure 1.
Governance mechanisms in supply chain agency relationships

contract they select (Gibbons, 2005). This approach relies on the so-called *information revelation principle*: when the menu of contracts is effectively designed, the agent's best strategy is to select the contract revealing their true type. In the simplest form, this would mean that the principal offers to pay so low price that only the most efficient supplier can meet it, but given the information asymmetry it is difficult for the principal to deduce such price level. Therefore, extant literature suggests mathematically sophisticated screening contracts like dynamic programming to account for past information and decisions (Zhang and Zenios, 2008) or to account for the needs for product specification by the principal (Iyer *et al.*, 2005); while a more conservative stream (Rogerson, 2003) states that contract menus for screening should be as simple as possible.

4.1.2 Signalling. Signalling refers to voluntarily revealing private information, e.g. about capabilities, and this signalling can be done by either agents or principals. Signalling by agents is often practiced by "high type" or cost-efficient agents (Bergen *et al.*, 1992; Heide, 2003). Two articles stress the importance of the principal's signalling actions as a way of revealing, for example, demand forecasts (Gümüş, 2014) or their own commitment to the relationship (Ross *et al.*, 1997). Given that signalling and screening (above) are both related to revealing private information and to some extent, self-selection, these two mechanisms could potentially be combined – indeed, Heide (2003) takes this approach. However, once one considers the role of *principal* signalling as well as *agent* signalling, such a combination appears inappropriate.

4.1.3 Selection. Empirical papers often use the term selection to describe a more interactive approach – very different from screening above – in which the principal may negotiate with agents and for example audit their operations. A typical selection process includes the use of certain transparent criteria, which are either self-reported by the agent or verified by the principal, for example by assessing an agent's past performance in other relationships (Antia *et al.*, 2013; Wilhelm *et al.*, 2016). In high uncertainty and high-risk settings, selection processes may be resource-intensive for both principal and agent, as in the example of a buyer organizing design workshops with suppliers (Zsidisin and Smith, 2005). However, Rivera-Santos *et al.* (2017) argue that *ex ante* selection of altruistic parties to an alliance may decrease the need for *ex post* monitoring. As such, a resource-intensive selection process should be undertaken only when the selection cost can offset the cost of shirking (Stump and Heide, 1996). However, as we will discuss later, such a cost-benefit analysis is often difficult, if not impossible, to obtain.

4.1.4 Monitoring. Unsurprisingly, monitoring is the most frequently mentioned governance mechanism in our sample. It is cited as a strategy to decrease information asymmetry and to mitigate post-contractual moral hazard. Monitoring is often deemed necessary especially when the agent's compensation cannot be outcome-based (Zu and Kaynak, 2012). Forms of monitoring vary, ranging from intensive behaviour monitoring, such as facility audits (Handley and Gray, 2013), to more arm's-length output monitoring through, e.g. quality checks and financial analysis (Heide *et al.*, 2007). Agents may perceive behaviour monitoring as intrusive (Rivera-Santos *et al.*, 2017), which may increase the likelihood of moral hazard (Heide *et al.*, 2007; Sharma, 1997). One important finding is that behaviour or output monitoring on their own seem relatively ineffective but combining both with effective enforcement appears to yield the best governance solution (Kashyap *et al.*, 2012). Interestingly, even with franchising, where the residual claimancy of the franchisee is often assumed to govern moral hazard, monitoring is seen as a necessary evil to eradicate potential horizontal brand freeriding (Combs *et al.*, 2004; Zhang *et al.*, 2015).

Monitoring is typically presented as an activity undertaken by the principal, leading to agency costs for the principal. In reality, however, one may expect that monitoring relies to some extent on the agent preparing reports, as in supplier-completed questionnaires (Hajmohammad and Vachon, 2016). For example, Green and Taylor (2016) explicitly mention

reporting as a mechanism in the form of an agent self-reporting progress on a complex development project. While most studies refer to the principal monitoring the agent, there are also examples of mutual monitoring (e.g. Broekhuis and Scholten, 2018) and third-party monitoring (e.g. Shevchenko *et al.*, 2020).

4.2 Goal alignment strategies

Goal alignment strategy aims to utilize wide set of mechanisms targeted to mitigate agency problems by reducing goal incongruence between the principal and the agent. In other words, the agency problems become less likely, when the agent's self-interest better matches with the common interest of the both parties.

4.2.1 Residual claimancy. The key governance mechanism in franchising relationships is residual claimancy: the franchisee (the agent) is made a (residual) claimant of the outlet revenues after the deduction of a certain royalty rate for the franchisor (the principal). This offers an incentive not to shirk. Indeed, the fundamental argument is that franchising is preferred especially when monitoring of the agent is costly, for example due to the large geographical distance between parties (Combs and Ketchen, 2003; Dahlstrom and Nygaard, 1994). Despite the effectiveness of residual claimancy to mitigate a *vertical agency problem* (between the franchisor and the franchisee), the mitigation of a horizontal agency problem (i.e. freeriding at the expense of the franchise brand and other franchisees) requires complementary mechanisms such as monitoring (Combs *et al.*, 2004; Zhang *et al.*, 2015). Residual claimancy is also simpler to implement in downstream relations, in which the agent is in direct contact with end customers and the financial risks of distributing the final product or service can be transferred. Conversely, in upstream relations, reward sharing programs can easily increase contract complexity and the need for collaboration, further increasing total costs (Tse *et al.*, 2018).

4.2.2 Outcome-based pay. Outcome-based contracts and performance-based contracts (PBCs) are terms used to denote agreements where rewards are largely or wholly dependent on output or outcome performance. Examples are piece rates or no-cure-no-pay arrangements. PBCs are seen as effective not only in governing moral hazard but also in fostering radical innovation (Sumo *et al.*, 2016). Outcome uncertainty is typically referred to as the key barrier in utilizing outcome-based contracts (Steinbach *et al.*, 2018; Zu and Kaynak, 2012). Therefore, some papers explicitly focus on developing indicators for agent compensation such as inventory level in make-to-stock production systems (Plambeck and Zenios, 2003) or risk adjusted healthcare payment systems (Fuloria and Zenios, 2001). However, outcome-based contracts may influence not only the agent's behaviour but also other stakeholders' behaviour (e.g. the end customer who the service provider agent is serving) leading to unexpected and undesired outcomes (Steinbach *et al.*, 2018). Hence, outcome-based pay may appear as a key remedy in aligning goals but is often challenging to implement.

4.2.3 Extracontractual incentives. If monitoring is seen as a core means to reduce information asymmetry, incentives appear to be the key mechanism to align goals between the principal and the agent. The term incentive is a complex one since all mechanisms to encourage effort can be seen as incentives. Therefore, we emphasize *extracontractual incentives* referring to all monetary forms of compensations and sanctions (bonuses and penalties) beyond the so-called base-line agreement (Kashyap *et al.*, 2012). Roughly 20% of the articles in our review discuss such incentives. These can be, for example, rewards and bonus schemes to induce suppliers to improve their performance (Hajmohammad and Vachon, 2016), positive price discrimination (Wilhelm *et al.*, 2016), but also disincentives or sanctions such as late penalties (Lewis and Bajari, 2014) or reduced payments when hospital readmission rates are high (Arifoğlu *et al.*, 2021). However, such incentive systems do not

always lead to positive outcomes since they are also subject to gaming (Obloj and Zemsky, 2015) and hence need to be combined with other governance mechanisms such as monitoring to verify the agent's performance (Kashyap *et al.*, 2012).

4.3 Integration strategies

4.3.1 Complex payment schemes. As discussed earlier, economists see contracts as the key governance mechanism in agency relations. In most articles, such contracts are in essence payment schemes. Many (mathematical modelling) ECON papers explore so called complex contracts (Kalkancı and Erhun, 2012), through which the principal's welfare could be optimized by getting as near as possible to the "first best situation" of symmetric information. The payment schemes are complex, because they typically involve multiple parts, such as upfront payments, milestone payments, and royalties in licensing (Crama *et al.*, 2008) or fixed fees, linear variable fees, and non-linear variable fees in franchising (Desai and Srinivasan, 1995). Different approaches are utilized including linear multi-parameter schemes (Chick *et al.*, 2017), multi-item non-linear schemes (Desai and Srinivasan, 1995; Kim *et al.*, 2007), dynamic schemes (Arve and Martimort, 2016; Plambeck and Zenios, 2003), and tiered schemes (Jain *et al.*, 2013). Some complex payment schemes are operationalizations of commitment, captured as a payment now and the promise of future payments, which can be contingent on, e.g. agent performance improvements (Li *et al.*, 2013) or varying stock levels (Gao, 2015). Such future promises are seen to mitigate not only moral hazard but also holdup problems (Board, 2011).

A common denominator between these complex payment schemes is that they aim to overcome both problems of information asymmetry and goal incongruence. Despite the intellectual attractiveness of such models, their empirical applicability remains contested which is why simple contracts are argued to capture the major portion of the total welfare against much lower cost (Rogerson, 2003).

4.3.2 Scope and structure. Some articles suggest manipulation of scope and structure as an approach to overcome agency issues. Mahoney (1992) claims that vertical integration allows for better goal alignment and becomes more attractive when the principal bases the compensation on observing efforts rather than outputs. Mookherjee and Tsumagari (2004) show how centralization of supply networks yields higher profits to the principal when compared to decentralization and using intermediaries. Heide (2003) argues that the principal should combine outsourcing and in-house manufacturing (plural governance) as the in-house operation helps the principal to learn about the agent's operations. In a similar vein, Makadok and Coff (2009) argue that hybrid governance forms (e.g. franchising and quasi-integration), mixing elements of market and hierarchy, may prove effective especially when compensation of the agent cannot be based on a single and simple metric such as exchange price.

4.3.3 Coordination. Coordination can be understood as efforts to specify task allocation between a principal and an agent. Thus, it can be seen as a mechanism integrating operations between the principal and the agent. Celly and Frazier (1996) distinguish between outcome-based and behaviour-based coordination efforts, the former focuses on coordinating bottom-line results (e.g. sales and profitability) while the latter aims to coordinate the actual tasks the agent should execute. Coordination can be brought about through contract completeness (Vivian Zheng *et al.*, 2020) but also through continuous efforts to harmonize operations between principal and agent (Zsidisin and Ellram, 2003). Coordination indirectly mitigates an agent's self-interested behaviour by decreasing information asymmetry and aligning goals. Coordination may also relate to the systematic optimization of capacity allocations (Chen *et al.*, 2014) and inventory levels (Corbett, 2001; Zsidisin and Ellram, 2003) among multiple parties of the supply chain and other tasks undertaken by parties to form cross-task synergies (Makadok and Coff, 2009). Finally, Argyres (1999) posits that use of information systems may enhance coordination by making information processing more cost efficient

which also improves governance when parties have a transparent view on the actions of other parties.

4.3.4 Support. Closely related to coordination as a governance mechanism is support provided by the principal to the agent. Such support can take the form of franchisor services (Vivian Zheng *et al.*, 2020), joint training programs (Wilhelm *et al.*, 2016; Zsidisin and Ellram, 2003), and supplier development (Hajmohammad and Vachon, 2016; Zu and Kaynak, 2012). These types of support create a mutual understanding of goals and disseminate knowledge between principals and agents (Vivian Zheng *et al.*, 2020). Support is considered a governance mechanism in its own right, separate from coordination, because it represents a conscious investment of the principal in the agent – to improve the agent's capabilities and competences, and hence improve relationship outcomes.

4.3.5 Social interaction. Social interaction refers to personal communication and information exchange among the representatives of principal and agent organizations. Increased interaction and communication ultimately lead to information sharing which increases the total welfare generated in the exchange relationship (Inderfurth *et al.*, 2013) as well as better information transparency (Wilhelm *et al.*, 2016). In the context of franchising relationships, social interaction between parties also has an educational purpose for the franchisee, resulting in mutual gains (Antia *et al.*, 2017). Social interaction can also act as a less-intrusive monitoring mechanism (Rivera-Santos *et al.*, 2017), avoiding the negative repercussions of using intrusive monitoring approaches as discussed above.

Intensive social interaction between supply chain partners can lead to "thick" relationships through which principal and agent continuously improve their joint products and processes, control opportunism, and share risk, i.e. align goals (Camuffo *et al.*, 2007). Such intensive interaction may pave way to informal social contracts, which refers to a micro-level informal agreement between the principal and the agent about the roles and responsibilities of the parties going beyond or complementing formal written agreements (Heide *et al.*, 2007). Indeed, the social contract may prove effective especially when the formal contract remains incomplete for example due to uncertainties (Ring and Van de Ven, 1994). Social contracts are ultimately about mutuality in party attitudes, perceptions of the other party's commitment, and fairness of the trade. A mutually perceived and accepted social contract can be established during contract negotiations and can become a prerequisite for effective contract management (Broekhuis and Scholten, 2018).

4.4 Psychological influence strategies

Some articles in our review mention governance mechanisms that help to reduce the risk of moral hazard while not specifically relating to information transferring or goal alignment but more on psychological and behavioural aspects. From more positive side, trust and sense of reciprocity can be seen to curb self-interest while credible threats can be used to create negative pressure to curb undesired behaviour.

4.4.1 Trust. Some of the reviewed articles argue that in some relationships, investment in governance mechanisms is in fact unnecessary, or barely necessary. This may be because either professional norms limit the risk of moral hazard (Sharma, 1997) or there is sufficient trust in the behaviours of the agent, based on a shared history (Shevchenko *et al.*, 2020). For instance, repetitive syndication, in the private equity industry, creates common experiences of success between investors, hence creating mutual trust in the other party's capabilities (Meuleman *et al.*, 2010). Norm-based trust and experience-based trust alleviate concerns that there may be a risk of agency problems in the relationship, and hence reduce the need to invest in other governance mechanisms in the relationship.

4.4.2 Credible threats. Various articles emphasize that the mix of governance mechanisms should also include "enforcement" (e.g. Kashyap *et al.*, 2012; Wilhelm *et al.*, 2016), meaning punitive actions by the principal towards wayward agents. Visible punitive actions towards

one agent signal punitive capacity (Morgan *et al.*, 2007), creating a credible threat of similar punitive actions towards other agents. Punitive actions include termination of the relationship (e.g. Grünhagen *et al.*, 2017), reducing share of business (e.g. Li *et al.*, 2013), and litigation (e.g. Antia *et al.*, 2013). While such credible threats are hypothesized to decrease moral hazard, Hasan *et al.* (2020) describe adverse effects of credible threats, documenting how the fear of losing business can drive agents to cut corners and hence increase moral hazard.

Principals can device structures to create competition between agents, or, in the case of plural governance (Heide, 2003; Perryman and Combs, 2012), between "make" and "buy", i.e. between in-house production and delegation to an agent. Competition also creates a threat; being aware of competitors introduces a credible threat of losing (a share of) business (Liang and Atkins, 2021). Competition can be used as a governance mechanism both upstream (e.g. Zsidisin and Ellram, 2003) and downstream (e.g. Lassar and Kerr, 1996). As Heide (2003) points out, high type agents may actually benefit from competition and plural governance as it enables principals to recognize high performance and rewards them accordingly.

Principals can also use "hostages" to create a credible threat. Powerful principals can force agents to make relationship-specific investments, such as buyers requiring suppliers to invest in specific tooling, effectively taking a hostage from the supplier (Stump and Heide, 1996). In the franchising context, franchisors can require franchisees to put up significant upfront capital to open a franchise (Fan *et al.*, 2017).

5. A typology of supply chain agency relationships

Our review reinforces the view that agency problems in supply chain relationships are predominantly caused by two factors: information asymmetry and goal incongruence between the principal and the agent. Therefore, to integrate past research under these two dimensions, we formed a two-by-two matrix (Figure 2) to illustrate four different conditions. We use "positive" terminology of *information transfer* (IT) and *goal alignment* (GA) allowing two axes logically to increase towards up and right forming the following four cells: cell 1 of low-low (IT and GA), cell 2 of high-low, cell 3 low-high, and cell 4 of high-high. For analytical simplicity, the matrix represents the two dimensions as binary variables (high vs low), although in real life the dimensions resemble continuous variables and drawing exact lines between conditions is difficult (cf. Watermann and Meier, 1998).

The cell conditions depend on the context in which the focal firm operates but are also directly or indirectly affected through different governance strategies deployed. However, the low-low cell can be seen as a baseline condition, i.e. if the focal firm does nothing, relationship dynamics tend to find equilibrium in this cell. As such, key questions are how, when, and why the focal firm should manoeuvre to other cells and under which conditions these cell conditions can be sustained. We have already touched on the how question in the previous section on governance mechanisms, which aggregate into three different strategies illustrated as the arrows in the figure (we discuss the special cases of psychological influence strategies separately). Whilst for ease of interpretation the strategy arrows point vertically, horizontally and diagonally from the origin, we note that they may to some extent be used in any position of the framework (e.g. goal alignment and integration strategies may be used to move from cell 3 to cell 4).

The core focus of the typology is to illustrate ideal relationship archetypes under each of four conditions as well as their empirical examples. In addition, we formulate propositions explaining when and why these relationship archetypes are most likely to be found and under which conditions they will be sustained. This theorization is based on the fundamental idea of *agency costs*, which can be further decomposed as the principal's *monitoring costs* [4], the agent's *bonding costs,* and the *residual loss,* i.e. the cost of agent shirking

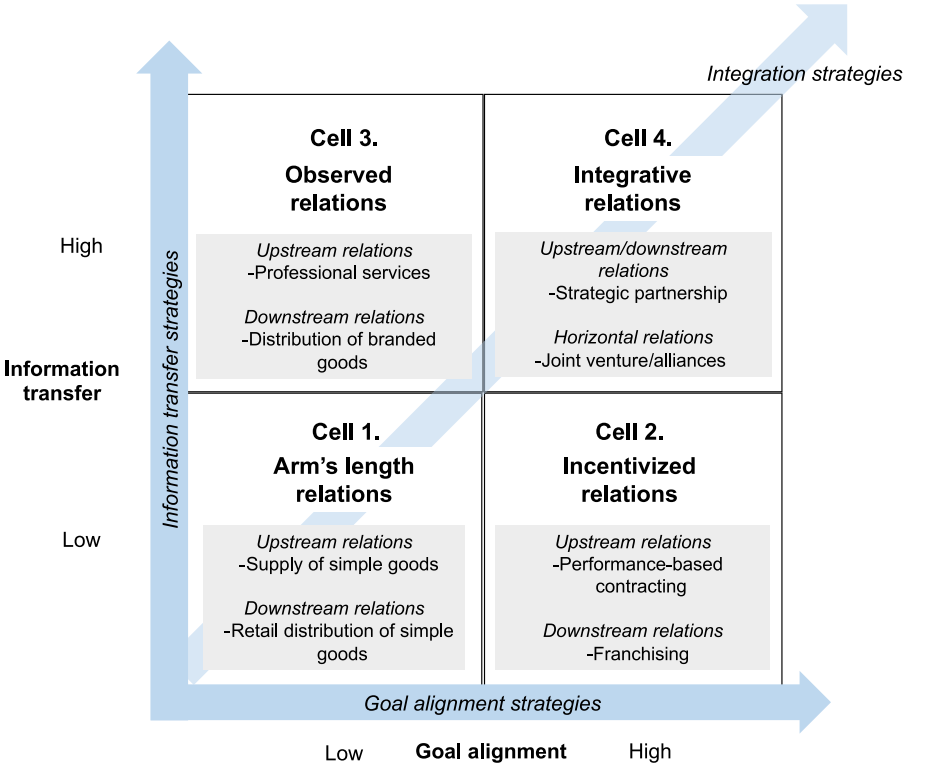

Figure 2.
Typology of supply chain agency relationships

(Jensen and Meckling, 1976). Simply put, the focal firm's strategic choices in terms of governance, and thus choice of relationship type, are the outcome of a crude optimization between these three factors. Yet, as we show below, such optimization problems are further moderated by the likelihood and impact of agency risk (i.e. agent shirking) as well as external uncertainty against which the principal insures itself when investing in governance.

5.1 Cell 1: low-low conditions and arm's length relations

To many, the low-low cell appears the worst possible position for the focal firm since the conditions are fruitful for agency problems to flourish. Several exogenous factors may contribute to such situation: First, the principal may be a new entrant to the market and thus has not developed enough information and capability to assess its trading partners and local conditions (Bergen *et al.*, 1992). Second, the market, where the focal firm operates, has high technological uncertainty, where volatility and constant changes force firms into a high degree of specialization (Sharma, 1997). Third, the geographical and/or cultural distance between the focal firm and its agents is high, making it difficult for the focal firm to attain information on an agent's activities (Fladmoe-Lindquist and Jacque, 1995). The focal firm may have only limited means to control these exogenous factors directly and therefore, the equilibrium tends to tilt naturally towards this cell. In turn, this encourages the focal firm to carefully evaluate the need and strategies to move out from this cell.

On the other hand, given that information sharing, incentives, and other governance mechanisms are costly, the low-low condition may be used as a deliberate strategy by the focal firm. We describe such a choice as deploying *arm's length relationships* representing the

baseline of supply chain agency relationships: e.g. the focal firm delegates a task to a supplier or signs a contract with a distributor. The focal firm has little to no prior information of the agent firm's capabilities and preferences, has little means (or interest) to align goals, and is thus highly subject to both adverse selection and moral hazard. Theoretically, given such conditions create a high likelihood of agency risk, such relationships can exist only when the impact of the risk [5], such as the harmful consequences of agent shirking, are relatively small.

Empirically, such situations are evident in transferring simple products or services in which information on agent's actions or type is not critical to the principal's welfare and neither is potential self-interested behavior. In other words, objectively verifiable information on the object of exchange (e.g. product) substitutes an agent's private information on their capabilities and actions. These products tend to have a low strategic priority (Kraljic, 1983) and therefore acquiring excessive information through monitoring or screening is unnecessary (Stump and Heide, 1996). Neither is it plausible to incorporate costly goal alignment mechanisms but the inherent goal conflict between principal's cost savings vs the agent's profits is governed through competitive bidding (Seshadri, 1995). These aspects together lead us to propose:

P1a. Low information symmetry and low goal congruence conditions are the baseline of supply chain agency relations and occur when the focal firm does not invest in governance mechanisms but settles for arm's length relationships.

P1b. The focal firm can sustain arm's length relationships when risk of agency problems is low to moderate due to high likelihood but low impact (e.g. transferring simple products and services).

It is thus crucial to understand when the so-called baseline condition is sustainable but also when and how to change the condition. As theorized above, agency risk, as the function of probability and impact, will at least partly determine the decision to move between the cells. When the strategic importance of the item under exchange increases, the impact of agency risk will also rise. Therefore, the focal firm needs to try to alter the information and goal environment in which the exchange takes place. In the following, by matching the governance strategies with the framework, we will explain factors influencing alternative positions in the matrix.

5.2 Cell 2: low-high conditions and incentivized relations

The focal firm may invest in goal alignment strategy to increase goal congruence, when monitoring the agent is difficult due to significant geographic or cultural distance between the focal firm and its upstream (Broekhuis and Scholten, 2018; Shafiq *et al.*, 2017) or downstream (Celly and Frazier, 1996; Kosová and Sertsios, 2018) agents. Traditionally, AT suggests that this occurs if the outcome is contractable, i.e. performance ambiguity is low, and if the agent is willing to carry the risk (Eisenhardt, 1989). The principal can thus use goal alignment as an insurance against agency risk by making the agent a *residual claimant* (carrying full risk and reward). Residual claimancy can be achieved effectively through franchising in downstream relations (Combs and Ketchen, 2003; Combs *et al.*, 2004) but can also be mimicked through outcome-based pay in both upstream buyer-supplier relations (Sumo *et al.*, 2016) and downstream channel relations (Celly and Frazier, 1996).

One key issue in outcome-based pay is that if the focal firm fully pushes the external risk to the agent, the focal firm may eventually suffer from the realization of the risk if the agent lacks capability. For instance, Antia *et al.* (2017) show in a franchising context that the franchisors should not solely rely on residual claimancy but should also deploy franchisee motivation and capability increasing mechanisms to safeguard them against bankruptcy. A similar situation applies in the buyer-supplier context if the costs (affected by random

shocks) are systematically higher than contract payments (Jain *et al.*, 2013). Therefore, before allocating work to agents, the focal firm must ensure they have sufficient financial and operational capabilities to absorb the external risks (Camuffo *et al.*, 2007).

This leads to another issue, namely that all performance-based contracts are to some extent *incomplete*, meaning they do not account for all possible future events arising from uncertainty (Hart, 2017). Therefore, such contracts may decrease the agency risk, yet become highly expensive to the focal firm if the agent is not willing to carry such risks. However, some agents appear relatively comfortable accepting outcome-based monitoring because it gives them self-control over their operations (Sumo *et al.*, 2016) provided that risk premiums are high enough (Gilliland and Kim, 2014; Camuffo *et al.*, 2007). The above issues can be to some extent resolved especially under moderate levels of performance ambiguity by providing extracontractual incentives, which do not fully push the risk to the agent while still potentially motivate to induce high effort (Kashyap *et al.*, 2012). These aspects together lead us to propose:

P2a. Under long distances and low to moderate performance ambiguity, the focal firm can seek low information symmetry – high goal congruence conditions by establishing incentivized relations through goal alignment strategy.

P2b. Incentivized relations decrease both the likelihood and impact of agency risks via risk transfer but can be sustained only when the agent is willing AND capable of carrying the external risks.

5.3 Cell 3: high-low conditions and observed relations

The focal firm can increase information symmetry inducing different information sharing strategies. When doing so, the focal firm seeks to establish *observed supply chain agency relationships*. Past AT research (Eisenhardt, 1989; Stump and Heide, 1996; Zu and Kaynak, 2012) suggests information sharing and monitoring is suitable under *high task programmability* (i.e. tasks can be agreed upon *ex ante* monitored more easily *ex post*) and under *high outcome ambiguity* (i.e. the outcome is too uncertain and risk cannot be passed to the agent). An example of such a situation could be buying consulting services, where the agent's performance and impact of the service is difficult to evaluate objectively and performance is also dependent on factors laying outside of their influence, but the focal firm can relatively easily monitor consultants work, e.g. via reporting or close monitoring (Roels *et al.*, 2010). In a similar vein, mystery shoppers are standard modi operandi to assess if a retailer complies with a manufacturer's brand-related standards (Lassar and Kerr, 1996).

Hence, high task programmability and outcome ambiguity are necessary antecedents to observed relations but we argue that such relations can be sustained mainly under moderate levels of agency risks. More specifically, observed relations are predominantly used to decrease the likelihood of agency problems (due to information symmetry the agent has less opportunities for shirking). However, they may have downsides because information sharing strategies can benefit the agent as well. For instance, in professional services, monitoring is often practiced through close social interaction (Sharma, 1997), which may in fact give informational advantage to the agent in terms of focal firm's proprietary information, leading to so called appropriation concerns among firms entering such relationships (Gulati and Singh, 1998). In the same vein, agents themselves might be reluctant to share private cost information (Kim and Netessine, 2013) and may perceive too stringent monitoring as intrusive, exacerbating opportunism (Heide *et al.*, 2007). As such, observed relations are clearly more suitable for products and services having higher strategic importance than under arm's length relations but when agent failure would not yet be existential to the focal firm, i.e. the impact of agency risk is moderate such as in leverage items in the Kraljic (1983) matrix.

P3a. Under high task programmability and high performance ambiguity, the focal firm can seek high information symmetry – low goal congruence conditions by establishing observed relations through information sharing strategies.

P3b. Observed relations decrease the likelihood of agency risks and can be sustained when monitoring is not perceived as intrusive AND the impact of information spillover abuse is low

5.4 Cell 4: high-high conditions and integrated relations

The final cell describes the situation of high information symmetry and goal congruence, and we describe relationships under these conditions as *integrated relations*. It goes without saying that such conditions are expensive to sustain due to high investments in information sharing and goal alignment. Furthermore, these relations are not just costly to the focal firm but require investments from the agent side as well, i.e. the agent's bonding costs (Jensen and Meckling, 1976) are high. Empirically, these relationships represent partnerships and alliances in which organizations engage in close collaboration with one another, sharing risks and rewards. Both organizations make specific investments into such relationships to align goals (Stump and Heide, 1996) and share information (Inderfurth *et al.*, 2013). Different types of risk and reward sharing schemes can be put in place to align goals and motivate information sharing (Tse *et al.*, 2018). Most likely, various social control mechanisms come into play with the increased integration and collaboration between personnel from both organizations (Meuleman *et al.*, 2010).

Given the high cost of establishing and sustaining such relationships, the classical agency cost formulation would suggest that the residual loss due to agency risk in such situations should be high. However, like observed relations, information sharing may in fact increase the impact of agency risk, when the agent receives proprietary information from the focal firm. Naturally, goal alignment through risk and reward sharing should decrease the likelihood of agent self-interested behaviour. However, integrated relations cannot be justified simply by the trade-off between costs of monitoring and residual loss. Instead, the risk, reward, and information sharing may help mitigate adverse effects of external uncertainty when both parties can jointly absorb the risks of external shocks (Camuffo *et al.*, 2007).

Thus, another fundamental reason for setting up such costly relations is to gain strategic complementarities (sometimes also referred to as supermodularity – see Cabigiosu and Camuffo, 2012), through combining the capabilities of the principal and the agent. Indeed, in investment alliances or syndicates knowledge complementarities are shown to positively moderate the partners' tendency to engage in embedded ties when agency risks are high (Meuleman *et al.*, 2010). In BSRs, information sharing and use of partnerships are argued to offer complementary outcomes when the buyer does not need to overly specify the products but parties can focus on jointly improving the production process (Iyer *et al.*, 2005). Essentially, the complementarities of an integrated relationship should offset their costs through increased efficiency, e.g. through new innovations in services, products, or processes (Peltokorpi *et al.*, 2020; Tse *et al.*, 2018). Therefore, investments in information sharing and joint practices are often seen as strategic relationships such as R&D consortiums (Argyres, 1999). These aspects lead us to propose:

P4a. The focal firm can seek high information symmetry – high goal congruence conditions by establishing integrated relations through goal alignment, information transfer and integration strategies.

P4b. Integrative relations decrease both the likelihood and impact of agency risks, and can be sustained when the costs of external shocks cannot be solely absorbed by

one party AND parties create strategic complementarities that increase value creation in the relationship.

5.5 Trust and credible threats as complementary mechanisms

As indicated in the previous section, trust can be seen as an effective governance mechanism against agency problems albeit it does not directly affect information transfer or goal alignment. The effectiveness of trust as governance mechanism can be seen to derive from the sense of reciprocity and sense of mutual benefit (see, e.g. Cox, 2004). Social interaction naturally accumulates trust, which means that one expects to have higher level trust in cell 4. Indeed, trust (and other relational mechanisms) are often seen to complement formal governance (Cao and Lumineau, 2015; Poppo and Zenger, 2002). However, interestingly empirical and simulation results by Shevchenko *et al.* (2020) suggest that trusted suppliers should be used without any complementary governance mechanisms only when buyer has low or moderate competence (on the outsourced effort), sources from limited number of suppliers and can use high selection criteria. Thus, trust seem to substitute the formal governance in governing moral hazard but would still require the focal firm to invest in informational governance mechanisms to mitigate adverse selection (e.g. through screening or selection). This leads us to propose.

P5a. Trust can complement governance mechanisms under each cell condition types but can substitute governance mechanism only when mitigating govern moral hazard but not adverse selection.

Finally, what comes to credible threats as governance mechanism, we see them most applicable under low-low conditions. This is because inducing high competition between agents is effective only when there are enough potential agents in the market (e.g. when the product or service is standardized). Thus, there would be no need to invest in costly mechanism of information transfer or goal alignment. On the other hand, inducing too fierce competition may have counterproductive effect if losing business drives agents to cut corners and hence increase moral hazard (Hasan *et al.*, 2020). Therefore, such mechanisms are best to be used when the impacts of agency risks are low like when transferring simple products and services (i.e. arm's length relationship). This leads to our final proposition:

P5b. Credible threats should be used as a supplementary governance mechanism only in arm's length relationships.

6. Discussion

In this section, we discuss the implications of our review and particularly the developed typology. Exceptionally, we begin with an extensive future research agenda, which is followed by summarizing the theoretical contributions and discussing of the managerial implications in the form of a process flowchart.

6.1 Future research agenda

Agency theory continues to hold significant promise in explaining various phenomena within OSCM. It is therefore somewhat surprising that it remains to some extent underutilised within the discipline. In the following, we present a future research agenda based on what we found, and perhaps more importantly, did not find in extant research across the four disciplines. This includes calls to measure agency costs more accurately; to examine residual *gains* alongside residual losses; to adopt a dual-sided perspective of agency relations; and to adopt agency theory to examine more complex supply networks in contemporary OSCM contexts.

6.1.1 Measuring agency costs. Our review points to a broad consensus that partnering and extra governance, such as monitoring and detailed contracting, are costly and a strategic choice of the principal (Lassar and Kerr, 1996). Whilst the idea of a simple cost-benefit analysis of agency versus governance costs appears conceptually sound, the lack of *measurement* of these costs is a significant limitation in extant research. In fact, we did not observe any rigorous efforts to operationalize agency costs in supply chain relations, though such attempts do exist in the corporate governance domain (cf. Westermann, 2018).

Across the disciplines, literature provides little, besides anecdotal evidence, on the costs incurred by the principal when deploying different sets of governance mechanisms. For example, whilst mathematical modelling papers may note that monitoring is expensive – hence the rationale for franchising or granting the agent residual claimancy under geographically dispersed systems – the *actual costs* of monitoring or setting up a franchising system receive scant attention. Similarly, papers considering other relationship types typically lack analysis of monitoring costs. A notable exception is Lee and Zenios (2012) who acknowledge that their conceptual outcome-based compensation model for treatment of renal disease might be unfeasible in practice given the potential costs of data collection.

The reviewed studies also offer no evidence on what such governance mechanisms cost the *agent* nor what the agent's reservation utility would be. Instead, much of the literature focuses on the agent's behaviour under different governance structures (Heide *et al.*, 2007) or on contextual contingencies predicting when a certain governance form would be preferred (Combs *et al.*, 2004). Therefore, we call for future research that seeks to evaluate agency risks and mitigation more precisely. Such work would further explain the viability of different relationship forms within our developed typology and the costs incurred of moves between different cells. In doing so, we stress the importance of assessing not only the costs incurred by the principal but also those of the agent.

6.1.2 Examining residual gain alongside residual loss. Residual loss describes the financial loss accrued to the principal due to the agent's tendency to act less efficiently than the principal when left unmonitored. Again, the issue of measurement described above is applicable here. Furthermore, the idea of residual loss is problematic because it contradicts the empirical reality that agents are often hired because of their unique skills, such as innovativeness (Wagner and Bode, 2014). In theoretical terms, the principal may be less capable of making decisions or taking proper actions than the agent and therefore should outsource the task (Schneider, 1987). The basic assumption that the agent is likely to do a worse job than the principal only holds true in the very simplest of contexts where the principal hires an agent to undertake a well-defined job and the principal lacks interest or time themselves but *does* have the capability. However, supply chain relationships are typically considered as value creating activities, meaning the principal can be significantly *better off* when delegating activity to agents especially when the principal and agents have complementary skills (cf. Dyer *et al.*, 2018).

Based on this, we suggest that future OSCM research should consider the possibility of *"residual gain"* alongside residual loss that may accrue from contracting-out. This would be crucial to further understand the benefits of integrated relations such as alliances and partnering, and connects strongly with recent work exploring the value of collective experimentation between inter-organisational parties in new product/service development (Browder *et al.*, 2022).

6.1.3 Adopting a dual-sided perspective of agency relations. The current principal-dominant tenet of agency theory represents a significant challenge to its use as a lens in OSCM research. As discussed, the reviewed research typically adopts a one-sided view when examining any relationship and posits arrangements that maximise the principal's utility. In doing so, we see agent firms painted as wilful yet self-interested contributors who only act in the principal's

best interest if compensated well or monitored frequently. Information asymmetry is predominantly viewed as one-sided and something that the principal suffers from.

However, we argue that agency issues are not merely, as originally suggested by Ross (1973), "the principal's problem", but a concern for both parties. In practice, the agent organisation may also suffer from the principal's private information on principal's preferences. In addition, they may be antagonistic towards certain governance mechanisms due to their increased operation costs or negative trust signalling (see, e.g. Gilliland and Kim, 2014; Heide *et al.*, 2007; Steinbach *et al.*, 2018). By adding the agent's preferences, one can better predict when a chosen set of governance mechanisms is likely to succeed.

To date, only a handful of studies across the four reviewed disciplines have approached inter-organisational agency issues from an agent perspective (for notable exceptions, see Heide *et al.*, 2007; Steinbach *et al.*, 2018) or sought data from both parties (for notable exceptions, see Handley and Gray, 2013; Homburg *et al.*, 2020; Lawrence *et al.*, 2021; Ross *et al.*, 1997; Sumo *et al.*, 2016; Wilhelm *et al.*, 2016). This leads us to call for a *dual-sided perspective* of agency relations within OSCM, expanding the rather cemented view that the principal is the one whose preferences matter (cf. Selviaridis and Norrman, 2014). Future research should consider both sides of the relationship by surveying agents specifically and better yet, by gathering dyadic or matched data.

6.1.4 Adopting agency theory to examine more complex supply networks in contemporary OSCM contexts. Our review demonstrates that agency relationships in supply chains are mostly considered in dyadic settings. Arguably, this is as an appropriate starting point given that the dyad is typically where the contract is made and where information sharing and goal-setting occurs. However, we also need to deepen our understanding of the complex supply networks in which such dyadic principal-agent relationships exist. While the governance mechanisms that the focal firm deploys are typically designed for the dyadic relationship, their impact can depend on, for example, collaboration and competition between multiple agents such as suppliers (Obloj and Zemsky, 2015; Wu *et al.*, 2010), franchisees (Vivian Zheng *et al.*, 2020), or sales partners (Homburg *et al.*, 2020), or competition between the buyers (Hu *et al.*, 2013; Tang and Kouvelis, 2011; Gupta *et al.*, 2015).

Few studies in our sample investigated these more complex settings such as triads, the agency chain, common agency, multiple agency, or the use of third-party organizations to monitor suppliers (for notable exceptions, see Broekhuis and Scholten, 2018; Hasan *et al.*, 2020; Homburg *et al.*, 2020; Lawrence *et al.*, 2021; Peltokorpi *et al.*, 2020; Wilhelm *et al.*, 2016; Zhang *et al.*, 2015). In addition, principal and agent roles can also be *dynamic* across different activities (Fayezi *et al.*, 2012). For example, a food retailer would typically be viewed as the principal in a relationship with a food producer but may switch to an agent role when delegated responsibility for maintaining food quality post-delivery [6]. This is particularly likely when the supplier is the more powerful player and can thus heavily stipulate behaviours to avoid product problems or potential brand risk.

In our view, the paucity of studies adopting agency theory for more complex supply network contexts does not signal a lack of suitability. Rather, it reinforces the need to expand agency theory's typical use beyond simple dyadic settings to become truly supply chain and network oriented (Choi and Wu, 2009; Pathak *et al.*, 2014). Informational and goal alignment problems will only grow when more players enter the game.

Many topics within OSCM lend themselves to the application of agency theory. For example, OSCM continues to engage actively with various aspects of sustainability (leading OSCM journals have launched multiple special issue calls, e.g. closed-loop supply chains with product re-manufacturing; OM under the goal of carbon neutrality; and environmental dynamism and supply chain complexity). In many respects, the issue of delegation is acute here with buyers typically attempting to ensure certain supplier behaviour, but with all the accompanying agency challenges this poses. In line with a small

group of OSCM researchers (c.f. Kim *et al.*, 2022; Wilhelm *et al.*, 2016), future research could clearly benefit from the application of agency theory to explore such challenges, for example examining the efficacy of the various governance mechanisms aimed at increasing information transfer, goal alignment, or both. Furthermore, the suitability of third-party certification in sustainability monitoring, and hence issues of third-party governance, warrant further research [7].

The digitalisation of OSCM continues to garner significant attention within our community (Brandon-Jones and Kauppi, 2018; Holmström *et al.*, 2019) and connects strongly with the sustainability agenda above. In adopting an agency perspective to this topic area, we see a potential double-edged sword for researchers to investigate. On the one hand, emerging technologies (for example, distributed ledger technology) have significant potential to increase information transfer through improved monitoring and signalling (Massimino and Lawrence, 2019). Similarly, data scraping technologies may enable more effective screening of potential suppliers, the use of more complex payment schemes, and enhanced collection of risk indicators across highly complex supply networks. In other words, existing and emerging technologies offer significant promise in increasing information transfer and goal alignment, enabling (potentially) more effective agency relationships.

On the other hand, emerging technologies are often technically complex and as such generate significant challenges for their sourcing and implementation, potentially *increasing* information asymmetry. Blockchain, artificial intelligence (AI), and other OSCM technologies can quickly become new "black boxes" for providers to leverage in terms of agent advantage. Furthermore, the inability of many principals to effectively codify their needs creates a high probability of *dual* information asymmetry, whereby the (potentially non-opportunistic) agent suffers from not knowing the principal's preferences (cf. Kauppi and Van Raaij, 2015). The adoption of emerging technologies in OSCM also runs the risk of "over-automation" whereby some governance mechanisms aimed at addressing the agency problems, such as social contracts, social interaction, and repetitive relationship, are given less credence than those that "fit" within big data/AI perspectives more readily, such as screening, (remote) monitoring, and reporting.

6.2 Theoretical contributions

Our study offers several important contributions to the OSCM community. First, by adopting a focal firm perspective, we have been able to analytically "stabilize" the dynamic application domain. Importantly, we do not underestimate the complexity and dynamic nature of supply networks (e.g. changing principal-agent roles or double agency as per Wilhelm *et al.*, 2016) but for the sake of theoretical parsimony, this focal-firm perspective has enabled more coherent theorizing on agency in supply chains.

Second, drawing on work from the four disciplines has supported the categorization of governance mechanisms that improve information transfer, goal alignment, or both. Critically, this provides a more nuanced managerial toolkit of mechanisms than those dominating traditional discourse, namely monitoring and incentives. In addition, it provides a potential bridge between relatively disconnected discussion of governance mechanisms in different disciplines.

Third, the categorization of governance mechanisms led us to create a typology of supply chain agency relationships. To further understand the viability of relationships with varying degrees of information transfer and goal alignment, we have emphasized the many times neglected, yet fundamental, concepts of agency costs and risks. In doing so, we stress the importance of principal-incurred costs, which have been the key foci in the past, but also agent-incurred costs, hence the dual-sidedness of agency issues. Critically, agency costs make *both* supply chain parties worse-off.

6.3 Managerial implications

Our review and subsequent synthesis are predominantly theoretical in its nature. However, the identified and categorized governance mechanisms do provide a clear "menu" from which managers can choose when planning their supply chain structures. We have further captured the key aspects of our typology and propositions into a stylized process flowchart in Figure 3. This distills our propositions into a simple decision-making sequence to guide towards suitable relationship formation when the focal firm needs to delegate work in its supply network. Naturally, the flowchart is a simplification of complex decision-making routine but it can work as a higher-level cognitive support for managers engaging into the daunting task of establishing new relationships or developing existing ones.

7. Conclusions

This study has taken a step towards a theory of supply chain agency by conducting a detailed review of extant research on AT utilized in a supply chain context in four neighbouring disciplines – the first of its kind. We focus our analysis and subsequent theory development on the two core elements shared among all four disciplines: information asymmetry and goal incongruence further complemented with considerations around agency costs and risk. We see that these form the viable basis for examining agency problems in supply chains for deriving theoretical foundations for existence of different types of supply chain relationships. Our work by no means represents a complete theory of agency in supply chain relationships and comes with limitations. Some of these are methodological (e.g. the reviewed journals represent only a sample of the total bulk of AT oriented agency research) and others are conceptual (e.g. how to effectively capture voices of the diverse fields and authors). Despite these limitations, we hope that our efforts will inspire and assist future researchers to continue the examination of agency issues in supply chains. Specifically, we advocate finding

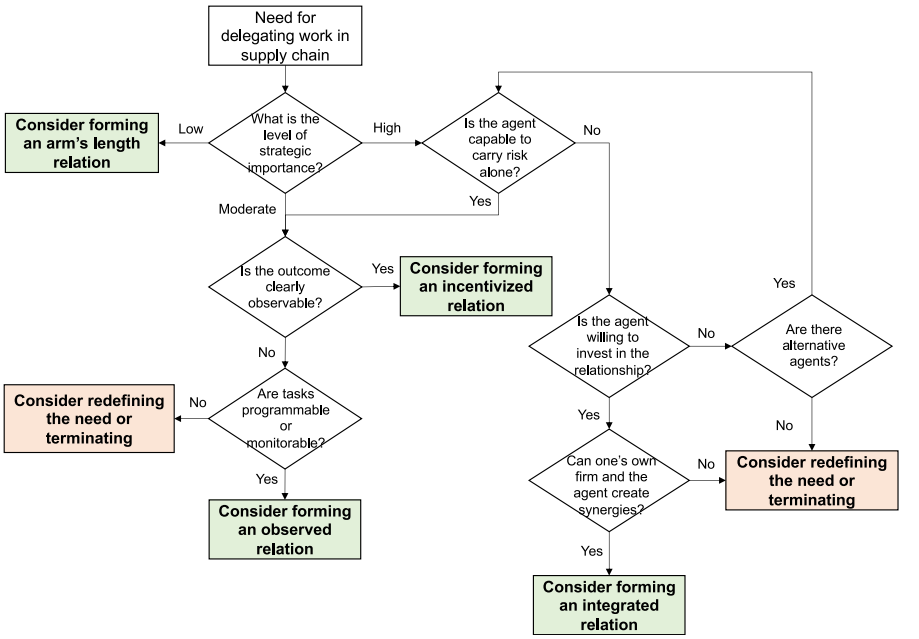

Figure 3.
Decision flow-chart for supply chain relationship formation

more robust ways to measure and operationalize agency costs, considering potential residual *gains* not simply losses, adopting a dual-sided perspective to agency issues, and leveraging AT to examine more complex supply networks in contemporary OSCM contexts.

Notes

1. Journals per discipline with their AJG ranking and UTD ranking status:
   OSCM: *Int J Oper Prod Man* (AJG 4)*; J Oper Manag* (UTD/AJG 4*)*; J Supply Chain Manag* (AJG 4)*; Manage Sci* (UTD/AJG 4*)*; M&SOM-Manuf Serv Op* (UTD)*; Oper Res* (UTD/AJG 4*)*; Prod Oper Manag* (UTD/AJG 4)
   MGMT: *Acad Manage J* (UTD/AJG 4*)*; Acad Manage Rev* (UTD/AJG 4*)*; J Manage* (AJG 4*)*; J Manage Stud* (AJG 4)*; Org Sci* (UTD/AJG 4*)*; Strateg Manage J* (UTD/AJG 4*).
   MARK: *J Marketing* (UTD/AJG 4*)*; J Marketing Res* (UTD/AJG 4*)*; J Retailing* (AJG 4)*; J Acad Market Sci* (UTD/AJG 4*)*; Market Sci* (UTD/AJG 4*)
   ECON: *Am Econ Rev* (AJG 4*)*; Econometrica* (AJG 4*)*; J Polit Econ* (AJG 4*)*; Rev Econ Stud* (AJG 4*)
2. Table 1 reports the relative weights of each studied element as percentages either from the disciplinary sub-sample (the columns two to four) or from the complete sample (the leftmost column). We do so only for illustrative purposes and to highlight the relative importance not to seek any statistical inference.
3. An example might be a relationship between a high-end component (e.g. a microchip) manufacturer and a low-end product (e.g. budget computers) manufacturer. In such situations, the component manufacturers may actually cease from selling their premium components to low-end manufacturers or at least heavily instruct their usage to avoid problems with the product or potential brand risk.
4. In this equation by Jensen and Meckling (1976), the term monitoring is used more widely than observing agent behaviour, i.e. it includes all governance mechanisms directed towards the agent.
5. When defining risk as the product of likelihood and impact (see, e.g. Mitchell, 1995)
6. We thank our reviewers for this very useful example of potential dynamic agency roles.
7. Again, we thank our reviewers for this interesting avenue for future research utilising agency theory.

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Appendix

Governance mechanism	Relationship type	Agency problem	References
1. Screening	Buyer-supplier	Moral hazard (MH)	Iyer *et al.* (2005)
		Adverse selection (AS)	Rogerson (2003)
			Zhang and Zenios (2008)
		Moral hazard (MH) and AS	Chick *et al.* (2017)
			Gagnepain *et al.* (2013)
			Gibbons (2005)
			Kim and Netessine. (2013)
	Manufacturer-distributor	MH	Iyer and Palsule-Desai (2019)
			Segal and Whinston (2003)
	Various	AS	Bergen *et al.* (1992)
2. Signalling	Buyer-supplier	AS	Gümüş (2014)
			Heide (2003)
	Manufacturer-distributor	AS and MH	Ross *et al.* (1997)
	Various	AS	Bergen *et al.* (1992)
3. Selection	Buyer-supplier	MH	Wilhelm *et al.* (2016)
			Zu and Kaynak (2012)
		AS and MH	Stump and Heide (1996)
			Zsidisin and Smith (2005)
	Franchisor-franchisee	AS and MH	Antia *et al.* (2017)
			Shane (1998b)
	Alliance	MH	Meuleman *et al.* (2010)
			Rivera-Santos *et al.* (2017)
4. Monitoring	Buyer-supplier	MH	Broekhuis and Scholten (2018)
			Camuffo *et al.* (2007)
			Green and Taylor (2016)
			Hajmohammad and Vachon (2016)
			Handley and Gray (2013)
			Heide *et al.* (2007)
			Morgan *et al.* (2007)
			Shafiq *et al.* (2017)
			Shevchenko *et al.* (2020)
			Wilhelm *et al.* (2016)
			Dong *et al.* (2016)
			Zu and Kaynak (2012)
		AS and MH	Hasan *et al.* (2020)
			Stump and Heide (1996)
			Zsidisin and Smith (2005)
	Franchisor-franchisee	MH	Combs and Ketchen (1999)
			Combs and Ketchen (2003)
			Combs *et al.* (2004)
			Dahlstrom, Nygaard (1994)
			Fladmoe-Lindquist and Jacque (1995)
			Kashyap *et al.* (2012)
			Kosová and Sertsios (2018)
			Lal (1990)
			Massimino and Lawrence (2019)
			Perryman and Combs (2012)
			Shane (1998a)
			Zhang *et al.* (2015)
		AS and MH	Grünhagen *et al.* (2017)
		AS, MH and hold-up	Shane (1998b)
	Manufacturer-distributor	MH	Israeli *et al.* (2016)
			Lassar and Kerr (1996)
			Lawrence *et al.* (2021)
	Various	MH	Bergen *et al.* (1992)
	Alliance	MH	Meuleman *et al.* (2010)
			Rivera-Santos *et al.* (2017)
	Licensor-licensee	MH	Jayachandran *et al.* (2013)

(*continued*)

Table A1. List of governance mechanisms, relationship types, and agency problems in the review sample

Governance mechanism	Relationship type	Agency problem	References
5. Residual claimancy	Franchisor-franchisee	MH	Combs and Ketchen (1999)
			Combs and Ketchen (2003)
			Combs *et al.* (2004)
			Dahlstrom, Nygaard (1994)
			Fladmoelindquist and Jacque (1995)
			Kosová and Sertsios (2018)
			Lal (1990)
			Massimino and Lawrence (2019)
			Perryman and Combs (2012)
			Shane (1998a)
			Zhang *et al.* (2015)
		AS and MH	Antia *et al.* (2017)
			Grünhagen *et al.* (2017)
		AS, MH and hold-up	Shane (1998b)
	Various	MH	Makadok and Coff (2009)
6. Outcome-based pay	Buyer-supplier	MH	Green and Taylor (2016)
			Kesner *et al.* (1994)
			Steinbach *et al.* (2018)
			Sumo *et al.* (2016)
			Dong *et al.* (2016)
			Zu and Kaynak (2012)
		AS and MH	Baiman *et al.* (2001)
			Hasan *et al.* (2020)
			Jiang *et al.* (2012)
	Manufacturer-distributor	MH	Lassar and Kerr (1996)
	Payor-provider	MH	Lee and Zenios (2012)
	Various	MH	Bergen *et al.* (1992)
	Alliance	MH	Gilbert and Weng (1998)
7. Extracontractual incentives	Buyer-supplier	MH	Gibbons (2005)
			Hajmohammad and Vachon (2016)
			Handley and Gray (2013)
			Inderfurth *et al.* (2013)
			Lewis and Bajari (2014)
			Obloj and Zemsky (2015)
			Wilhelm *et al.* (2016)
			Zu and Kaynak (2012)
		AS and MH	Jiang *et al.* (2012)
	Manufacturer-distributor	MH	Gilliland and Kim (2014)
	Payor-provider	MH	Arifoglu *et al.* (2021)
			Aswani *et al.* (2019)
			Fuloria and Zenios (2001)
			Peltokorpi *et al.* (2020)
	Various	MH	Makadok and Coff (2009)
		AS and MH	Bergen *et al.* (1992)
	Alliance	MH	Rivera-Santos *et al.* (2017)
	Licensor-licensee	MH	Jayachandran *et al.* (2013)

Table A1. (*continued*)

Governance mechanism	Relationship type	Agency problem	References
8. Complex payment schemes	Buyer-supplier	MH	Kim *et al.* (2007)
			Li *et al.* (2013)
			Plambeck and Zenios (2003)
		AS	Arve and Martimort (2016)
			Feng *et al.* (2015)
			Hu *et al.* (2013)
			Kalkancı and Erhun, 2012
		AS and MH	Chick *et al.* (2017)
			Gao (2015)
			Kim and Netessine (2013)
		Double MH	Jain *et al.* (2013)
			Roels *et al.* (2010)
		Holdup	Board (2011)
	Franchisor-franchisee	MH	Desai and Srinivasan (1995)
			Fan *et al.* (2017)
	Payor-provider	MH	Fuloria and Zenios (2001)
			Lee and Zenios (2012)
	Licensor-licensee	AS and MH	Crama *et al.* (2008)
9. Scope and structure	Buyer-supplier	MH	Gibbons (2005)
			Mahoney (1992)
		AS and MH	Heide (2003)
	Payor-provider	MH	Peltokorpi *et al.* (2020)
	Various	MH	Makadok and Coff (2009)
10. Coordination	Buyer-supplier	MH	Argyres (1999)
			Broekhuis and Scholten (2018)
			Sumo *et al.* (2016)
			Tse *et al.* (2018)
			Zsidisin and Ellram (2003)
			Zu and Kaynak (2012)
	Franchisor-franchisee	MH	Kashyap *et al.* (2012)
			Vivian Zheng *et al.*, 2020
	Manufacturer-distributor	MH	Celly and Frazier (1996)
			Homburg *et al.* (2020)
			Lassar and Kerr (1996)
		AS	Chen *et al.* (2014)
	Various	MH	Makadok and Coff (2009)
11. Support	Buyer-supplier	MH	Hajmohammad and Vachon (2016)
			Wilhelm *et al.* (2016)
			Zsidisin and Ellram (2003)
			Zu and Kaynak (2012)
	Franchisor-franchisee	MH	Vivian Zheng *et al.*, 2020
	Manufacturer-distributor	AS	Iyer and Palsule-Desai (2019)
	Payor-provider	MH	Aswani *et al.* (2019)
12. Social interaction	Buyer-supplier	MH	Argyres (1999)
			Broekhuis and Scholten (2018)
			Camuffo *et al.* (2007)
			Hajmohammad and Vachon (2016)
			Heide *et al.* (2007)
			Inderfurth *et al.* (2013)
			Tse *et al.* (2018)
			Wilhelm *et al.* (2016)
			Zu and Kaynak (2012)
		AS and MH	Gao (2015)
			Zsidisin and Smith (2005)
	Franchisor-franchisee	AS and MH	Antia *et al.* (2017)
	Manufacturer-distributor	MH	Celly and Frazier (1996)
			Homburg *et al.* (2020)
		AS	Ross *et al.* (1997)
	Various	AS and MH	Ring and Van de Ven, 1994

(*continued*)

Table A1.

Governance mechanism	Relationship type	Agency problem	References
13. Trust	Buyer-supplier	MH	Sharma (1997) Shevchenko *et al.* (2020) Steinbach *et al.* (2018)
	Alliance	MH	Meuleman *et al.* (2010)
14. Credible threats	Buyer-supplier	MH	Li *et al.* (2013) Liang and Atkins (2021) Morgan *et al.* (2007) Zsidisin and Ellram (2003)
		AS	Cremer and Kahlil (1992)
		AS and MH	Hasan *et al.* (2020) Seshadri (1995) Stump and Heide (1996)
	Franchisor-franchisee	MH	Fan *et al.* (2017)
		AS and MH	Antia *et al.* (2013) Grünhagen *et al.* (2017)
	Manufacturer-distributor	MH	Lassar and Kerr (1996)
	Alliance	MH	Gilbert and Weng (1998)

Table A1.

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