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The interplay between power structure and decision-making in supply chains: A systematic review

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Abstract – This study provides a systematic review of the literature and a conceptual framework of the interplay between power structure and supply chain decision-making. This systematic review studies 281 research papers published in peer-reviewed journals between the year 1994-2020 and uses content analysis and network visualization of major themes and keywords. Thematic analysis was conducted to examine growing discussion in the literature and to identify research gaps. The findings of this review highlight the component of power structure across business-to-business (B2B) relationships, including its impact on companies' decision-making. Past literature indicates that power, originating from various sources, could be deliberately exploited and exercised by a company to influence the process and outcome of supply chain decisions. The findings demonstrate the mechanics of power and the prevalent domains of decision that are discussed in the organizational power literature: pricing, quality management, sustainability, alliance building, sourcing, investment, inventory, product development and power shifting efforts. The main contribution of this paper is that it provides a critical synthesis of the role of power structure in supply chain decision-making, identifying 7 novel themes and related future research avenues. For managers and decision-makers, this study helps to raise situational awareness to comprehend power structures among supply chain collaborators. This awareness may help managers to identify threats to and opportunities for future supply chain decisions.

Keywords: Power Structure; Supply Chain Collaboration; Business-to-Business; B2B, Decision-Making; Buyer-Seller Relationships; Partnerships

1. Introduction

In the context of supply chain collaborations, power is seen as the vital attribute that influences the operational performance and behavior of supply chain partners (Cox 1999, Cox et al. 2001). The role of power is significant, such that it can be used as an enabler to dictate the level of participation of collaborators in order to satisfy a company's business interests. Inherently, however, power structure manifests itself disparately across different relationships, so the degree is not always easy to identify. Literacy on power structure is increasingly needed, if companies wish to make better use of their resources and lead their collaborators to achieve business target.

Historically adopted from the social sciences, the concept of 'power' is increasingly recognized across the supply chain (Dahl 1957, Emerson 1962, French 1956) as well as within the marketing management discipline (El-Ansary and Stern 1972, Etgar 1976, Gaski 1984, Hunt and Nevin 1974, Wilkinson 1973). It has recently focused more specifically on the topic of supply management and purchasing (Caniëls and Gelderman 2005, Cox 1999, Gelderman et al. 2008, Kraljic 1983, Ramsay 1994, Van Weele and Rozemeijer 1996). Power is also considered as one of the fundamental aspects of supplier relationship management (Giannakis 2012, Lintukangas 2011).

Power, specifically in an inter-organizational or inter-firm context, is defined as an actor's potential to convince another actor to behave in a manner they would not behave otherwise (Emerson 1962). Power is also defined as the ability to influence another actor's decision-making criteria (El-Ansary and Stern 1972). According to Pfeffer and Salancik (1978), power is the ability to accomplish one's own goals, even when they

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conflict with those of others, via the ability to inflict sanctions, because other businesses depend on their resources. In relation to that, Gaski (1984) suggests that an actor's reliance on the other actor leads to power imbalances which eventually limits an actor's freedom and conduct to make business decisions. The goal of inter-organizational power, according to Cox (2004), is owning and managing critical assets that allow an actor to appropriate and grow wealth via continuous leverage of customers, competitors, and suppliers. Apart from inter-organizational power, there are also other types of power that may impact supply chains to some extent, such as intra-organizational power between functions in a company, power between a labor union and employers, power in state governance impacting policy making in commodity trade and industry, and also power structure in trade between countries. In this paper, however, our focus is limited to inter-organizational power structure between companies.

The past decades have witnessed a proliferation of studies on inter-organizational power structure in the field of supply chain management (Zhao et al. 2008, Cox 2004, Hingley 2005, Maloni and Benton 2000, Pfeffer and Salancik 1978, Lawler and Bacharach 1981, 1987). Prior studies have examined the impact of power structure on supply chain aspects such as profitability, relationship quality, and supply chain efficiency. Specifically, among others, the extensive literature studied the influence of power: on synergistic resource development in a co-opetitive buyer–supplier relationship (Nair 2011), on strategic distribution channel decisions under power asymmetry (Li et al. 2013), on suppliers' normative relationship quality to the buyer and on collaborative innovation (Kim et al. 2019), on service level of a logistic service provider, its profit, and the overall supply chain efficiency (Zhang et al. 2019), on the depth of collaboration, whereby it is minimal if there is power asymmetry (Kähkönen 2014), on RFID implementation and infrastructure building (Boeck 2008), on profit distribution among multi-echelon SC actors under uncertainty (Gupta, Biswas and Kumar 2019) on the equilibrium prices, rate of returns, and channel performance in dual-channel closed loop supply chains (Zheng 2017), on the efficiency of collection activities in a closed-loop supply chain (Mi 2018), on the amount of strategic inventory in a green supply chain (Dey 2018), on the implementation of sustainability practices, and on the management of its values and risks (Touboulic et al. 2014), and on channel strategies and profitability (Gao 2016).

Meanwhile, the discussion of the interplay between power structure and decision-making process continues to grow. Decision-making processes are an inevitable aspect of supply chains, occurring at operational, tactical and strategic levels, and are not immune to the influences of governing powers. This paper aims to investigate what the literature has found in regards to this influence of power structure on decision-making in a supply chain context (see Figure 1).

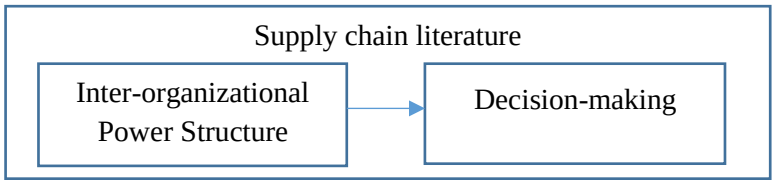

Figure 1. The investigated relationship between power structure and decision-making

Using different methods and departing from different theories, multiple attempts have suggested that power may influence various aspects of decision-making. For example:

- Gong et al. (2019) suggests that in a closed loop supply chain, the dominant member of a supply chain will be the one who ensures the optimality of decisions such as a strategy and profitability.
- Yu and Han (2019) suggests that power influences the choice of product between green or regular products. Power also influences product differentiation and pricing decisions of two competing manufacturers.
- Liu et al. (2019) suggests that expert power, the power coming from good knowledge base, may influence the adoption of sustainable practices in supply chains. This will help global firms to align their sustainability vision with its suppliers around the world.
- In the context of supplier management, Terpend and Ashenbaum (2012) suggests that power coming from the size of a supplier network may influence the performance of a supplier, including the value of collaborative decision-making within the buyer-supplier relationship.
- Ebers (2015) suggests that power influences the decision of members to invest on a specific asset. When there is power asymmetry, a more powerful member of the chain will force the weaker member to bear more cost and invest more, such as in development stage and research. This will create a hostage effect

in which the weaker member will follow the influential member's decisions because otherwise they will have jeopardized profits.

- Kurtuluş (2012) suggests that power balance and contractual structure contribute to the implementation of joint forecasting decisions. Unlike the general expectation, power does not necessarily improve the value of collaborative forecasting. On contrary, when a supply chain member becomes too powerful, in a way that it appropriates the most value, the other member becomes reluctant to invest more effort in collaborative forecasting. This behavior will eventually lead the influential member to have a less than optimal value of joint forecasting decisions.

Given this plausible interplay between power structure and decision-making in the supply chain literature, this paper thus looks to discuss the following research questions:

1. Which terminologies and theories are referred to in past studies indicating the impact of power structure on supply chain decision-making?
2. What does the literature say about how inter-organizational power structure affects both the process and the outcome of supply chain decision-making?
3. What are the recurrent domains of supply chain decisions that have been discussed in the study of inter-organizational power structure?

The overarching goal of this review paper is to synthesize previous research across a number of fields that elucidates the apparent research gap between supply chain power structure and supply chain decision-making, while providing a framework and suggestions for future research.

The manuscript is organized as follows. Following the introduction, Section 2 explains the methodology conducted for the systematic review. Section 3 presents the bibliometric analysis through network visualisation and reference analysis. Section 4 discusses the categories of supply chain decisions being studied in the power literature, and presents a conceptual framework and agendas for future research avenues. Finally, Section 5 concludes the paper with suggestions.

2. Methodology

This study employs the systematic literature review method to provide synthesis and analysis of the past evolution of power literature across supply chain contexts. The research is conducted in the following order: (i) network visualization of major themes and keywords; (ii) content analysis of each paper and (iii) thematic analysis to define major themes and research directions.

To gather relevant information on the apparent impact of power structure on supply chain decision making, we built on the Scopus database with several inclusion and initial exclusion criteria. We focus on the articles with either title, abstract, or keywords that includes two sets of keywords within itself: keyword set 1 contains phrases commonly written in power-related literature (e.g. power structure, power base, power source, power relation, power regime, power use, power imbalance, power balance, power hierarchy, and power dominance), and keyword set 2 contains words and phrases used in the supply chain literature (e.g. supply chain, supplier and buyer, supplier and manufacturer).

This study conducted a search using a search string in Scopus database to get all relevant papers published dating back 1994 to 2020. We narrowed down the search to two document types which are journal articles (type "ar") written in English. The search string was made using Boolean logic and is written as below:

TITLE-ABS-KEY ("power structure" OR "power base" OR "power source" OR "power relation*" OR "Power regime" OR "power use" OR "power *balance" OR "power hierarchy" OR "power dominance" AND "supply chain" OR (supplier AND buyer OR manufacturer)) AND (LIMIT-TO (DOCTYPE, "ar") OR LIMIT-TO (DOCTYPE, "re")) AND (LIMIT-TO (LANGUAGE, "English"))

Note: Boolean "*" allows for inclusion of various prefixes. Boolean "ar" refers to 'article' types of publication, which means it excludes books and conference papers. Boolean "re" refers to a correction of a previously published article.

From 432 search results, the list of papers was then cleaned through several criteria. The list was then cleaned further through the following protocol:

1. Read title and abstract. Delete the irrelevant topics.
2. Some papers are slightly related to power, which we decide to
   a. Include, if these studies refer to power between firms, i.e.,
      - On the impact of industry deregulation in industry transformation (Sinclairet al. 2014, 2015)
      - On the impact of a policy to enterprises in China (Guo et al. 2015)
   b. Exclude, if the studied object is other than power between firms, i.e.,

- On trade power structure between countries (Matsushita 2014)
- On intra-organizational power (Li et al. 2018), (Helin and Babri 2015, Souza et al. 2015)
- Feminist political economy / Exploitation of labour (Dragojlovic 2012, Hauf 2017, Lebaron 2015, Taylor 2011)
- Political power in elite exporters of a country who has more rights to harvest certain commodities (Cunningham et al. 2016), (Koenig-Archibugi and Macdonald 2017).

After reading each abstract, we excluded papers which discuss power in a context which is not relevant for our purposes e.g.: power source in energy and electricity context, power in state governance, power expression and identity in architecture, tribal power, trade power structure between countries, intra-organizational power, power themes in feminist political economy, labor-employer relationships, and political power in elite exporters of a country who has more rights to harvest certain commodities. We decided to retain (at this stage) papers that refer to power between firms, namely on the impact of industry deregulation in industry transformation, and on the impact of a policy to enterprises in a specific region.

As a result, 281 articles remained shortlisted for review. We proceeded with bibliometric analysis using two tools: VOSviewer and SciMAT. VOSviewer is a software to help visualize bibliometric networks. We specifically looked into the networks of keywords appearing in the selected literature to identify the major themes by creating keyword clusters, and other potentially useful information i.e., the most frequently used methodology and theory. SciMAT is then used to examine the co-occurrence of keywords across literature.

Further, we conducted a content analysis of each paper. We elicited the data from each paper by answering each of the following questions in a spreadsheet format: what is the objective of the study? How is power defined? What power reference is used? What areas are related to power? What theory was used to describe power? What sources of power are considered? What types of supply chain related decisions were considered? How is this decision made? What methodology was carried out? If empirical, what is the sampling size? If interview, who are the interviewees? What is the context of the actors' relationship (vertical/horizontal)? How many actors are considered? Where is the location sampling/geography? What is the type of industries being involved? What are the main findings? The data elicited is then coded. The result is presented in the next section. Finally, we conducted a thematic analysis to define the major theme and research directions. This is discussed in Section 4.

3. Results

The result of this systematic literature review is a mix of descriptive statistics of bibliometric values along with authors' interpretation of the collected data. We discuss bibliometric results immediately below in subsection 3.1, including the trends in the number of publications and the co-occurrence of keywords. In the next subsections, we turn to the content analysis, reporting about the ways in which power appears in the supply chain literature.

3.1. Bibliometric Analysis

We identified journal sources that contribute the most in this particular topic of power in supply chains. According to the frequency, Journal of Supply Chain Management is the top contributor (15 articles), followed by International Journal of Production Economics in the second position (14 articles). The third top contributor is occupied by Sustainability (Switzerland) (13 articles), in the fourth position is European Journal of Operational Research (10 articles) and in the fifth is International Journal of Production Research (9 articles).

Based on the frequency of publication each year, we find an increasing trend of total number of articles published (Figure 2). The highest number of relevant publications was in 2017 (39 articles), then in 2018 (38 articles), in 2019 (29 articles) and in 2020 (27 articles).

Using the database of shortlisted articles, we examine the popular terminologies and concepts being mentioned and discussed throughout. To do this, three techniques are employed: 1) keyword occurrence per article, 2) a density visualization technique, and 3) network visualization technique. To count keyword occurrence for each article in the database, we used SciMAT software. Density visualization technique is then employed using VOSviewer software to analyse the saturation and co-occurrence of certain keywords

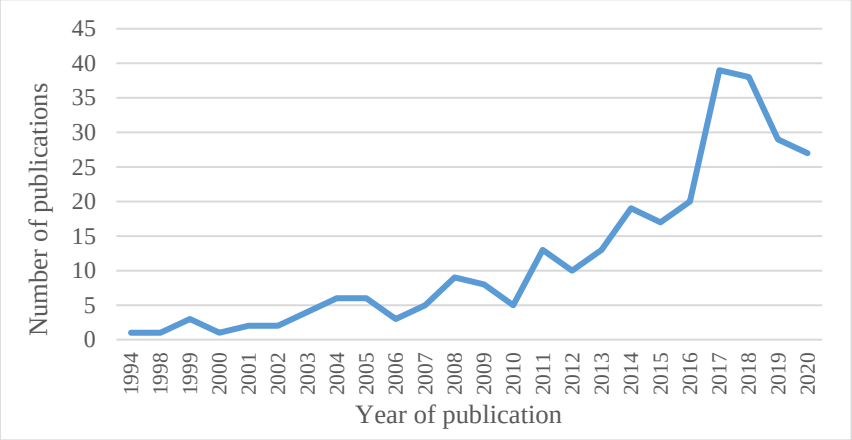

Figure 2. Increasing trend of publications

throughout the content of the reviewed articles. This density is represented in an image. Finally, to clarify this plausible association between concepts or keywords, we conducted a network visualization technique using VOSviewer software.

Keyword Occurrence Using SciMAT

Using SciMAT software as the following step, we then analyse the occurrence of keywords which specifically occur across article titles instead of across the whole content (Table 1). We find that 'game theory' is the most frequently occurring keyword across all articles. This may indicate that power structure within supply chain context is mostly illustrated mathematically through game theory techniques.

Table 1. Word statistics based on journal article titles, analysed through SciMAT†

Keywords appear in article titles	Number of documents	Keywords appear in article titles	Number of documents
Game theory	41	Closed loop supply chain	8
Sales	32	Sales	7
Manufacture	31	Retailing	7
Profitability	27	Marketing	7
Power	24	Channel power	7
Costs	23	Chains	7
Power structure	21	Stackelberg games	6
Power structures	18	Power asymmetry	6
Pricing	16	Optimal decisions	6
Decision making	13	Economics	6
Supply chain	19	China	6
Pricing decision	12	Case study	6
Power relations	12	Buyer seller relationships	6
Costs	12	Sustainable development	5
Sustainability	10	Supply chain coordination	5
Food industry	10	Stakeholder	5
Competition	10	Sensitivity analysis	5
Trust	8	Resource dependence theory	5
Dual channel supply chain	8	Pricing strategy	5
Decision theory	8	Power balance	5
Commerce	8	Online channels	5

Density Visualization

Using VOSviewer software, the keywords written in articles were color-coded based on the year of publication. Although the term 'supply chain management' was coined already in the 1980s, we notice that the terms 'power structure' and 'decision theory' are relatively new as co-occurring terms in the supply chain

† Note: only keywords occurring in at least 5 documents are shown in Table 1. Each document (article) may contain several concepts being present together. Only documents that have >5 repeat keywords are displayed.

literature. Based on our Scopus search this could only be found from 1994 onwards. Figure 3 shows 50 most frequent keywords occurring in relevant articles until 2020.

Based on Figure 3, we notice that the term 'power', 'power balance' and 'channel power' have appeared more than a decade ago (colored in blue) yet they are located further away from the centre of the field or from the oldest term of 'supply chain management'. This means that power has been acknowledged in ancient supply chain literature, however distant and isolated they were discussed. We see a new term 'power structure' (colored in yellow), however, that is located closer to the central term, which may indicate that power structure has been increasingly considered an important topic of discussion. In addition, it is also found that some terms e.g. 'game theory', 'manufacture', 'profitability', and 'competition' are located closer to the center yet have been discussed longer (colored in green) than the term 'power structure' in a supply chain context.

Using this density visualization, we created clusters based on the frequency of co-occurrences of terms across articles. The total of 50 items in Figure 3 is then categorized into 6 clusters:

- The first cluster consists of the following keywords: *cost effectiveness, costs, green supply chain, managerial implications, power structures, pricing, sales, sensitivity analysis, Stackelberg game, wholesale prices.*
- The second cluster consists of: *decision making, environmental impact, governance, governance approach, marketing, power relations, retailing, stakeholder, supply chain management, sustainability, and sustainable development.*
- The third cluster consists of: *China, chains, competition, economics, power, power structure, supply chain.*
- The fourth cluster consists of: *game theory, game-theoretic model, non-cooperative game, optimal decisions, power balance, pricing decision, profitability, and supply chain coordination.*
- The fifth cluster consists of: *commerce, dual channel, dual channel supply chain, online channels, pricing strategy, and structural optimization.*
- The sixth cluster consists of: *channel power, closed-loop supply chain, decision theory, manufacture, and numerical experiments.*

This clustering system depicts the closeness between keywords within the same cluster. From these clusters, we identify that the term 'power' often co-occurs with the term 'decision' in an article. This is shown, for example in the second, fourth, and sixth cluster. In other clusters, though we do not see the literal term of 'decision', we see related words such as 'pricing' in the first and fifth cluster. Although we do not know yet, at this stage, what the two terms of 'power' and 'decision' have to do with each other in a supply chain context, we may infer that they are associated regularly.

Network Visualization

The analysis used the association strength method, with attraction value '2' and repulsion value '1', which results in a zoomed-in view of associations and closeness between keywords. There are 40 items displayed across 2 clusters (Figure 4):

- The first cluster consists of 22 items including the following recent keywords (colored in yellow): *channel, channel power structure, consumer, contract, cost, decision, demand, leader, manufacturer, manufacturer Stackelberg, member, optimal decision, power structure, price, pricing decision, product, profit, retailer, retailer Stackelberg, scenario, supply chain power structure, and vertical Nash.*
- The second cluster consists of 18 items, which are: *ability, business, buyer, case study, coercive power, company, dynamic, interview, knowledge, manager, network, power relation, power relationship, power source, relation, relationship, and research.*

We notice that in the first cluster, there is a recent affinity shown between the term 'power structure' and 'decision' (colored yellow). This means that the association between the two keywords has become increasingly apparent though time.

Based on these clusters, we can develop an impression of research types being used across articles. The first cluster displays some keywords that are commonly used in numerical representation of power structure within game theoretical modelling: leader, manufacturer Stackelberg, optimal decision, power structure, pricing decision, retailer Stackelberg, scenario, and vertical Nash. Since the term 'power structure' and 'decision' also appear in this cluster, this may indicate that most studies discussing power-decision associations are game theory based modelling-focused instead of real life empirical studies. On the other hand, the second cluster indicates keywords that adopt multidisciplinary organizational management literature from various fields focusing on managerial and 'soft' aspects of supply chains, which could include either conceptual, empirical, or both studies.

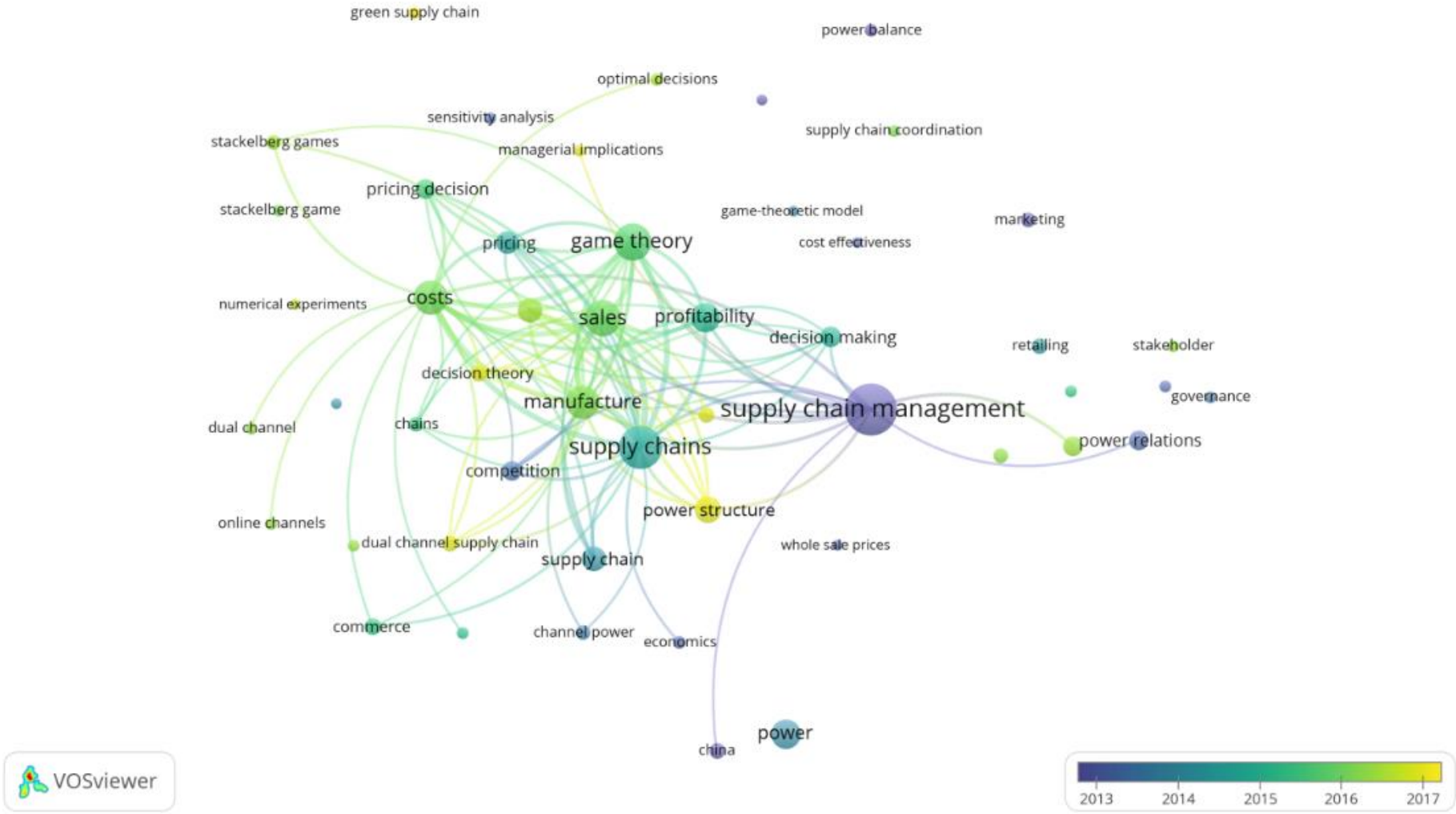

Figure 3. Overlay visualization of keywords

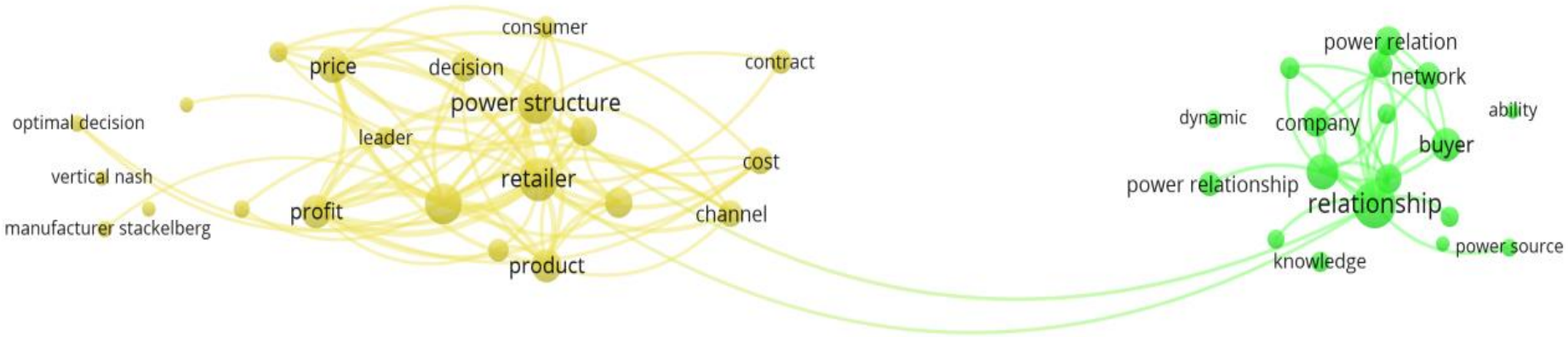

Figure 4. Network visualization of keywords[3]

[3] Note: Between these two distant clusters, a couple of connections are identified. The two lines (Figure 4) that connect one cluster to another represent the relationships between the term 'power structure' and 'retailer' on one pole and 'relationship' on the other pole.

3.2. Proposed Definitions of Power

To better understand the perspectives of power across articles, we examine the various definitions of power used throughout. The widely accepted definitions of power in a supply chain context, as referenced by several articles in our database, are presented in Table 2.

Based on Table 2, we notice that power concepts have been discussed as early as in the 1960s by Dahl and Emerson in a broader social and economic context. Power is illustrated such that A has control over B because A can persuade B to do something B otherwise would not (Dahl 1957). Extending this concept, Emerson (1962) later suggests that this capacity to persuade others is rooted in the dependencies between actors. If Actor A depends on Actor B, then Actor A's objectives are less likely to be attainable as a result of the relationship with Actor B. Emerson also adds that regardless of whether or not actors intend to utilize power, power is a basic tenet of politics, and it will always be available.

Despite the growing awareness of power in social economical context, the concept of power only appeared in the supply chain and business marketing literature around 10 years later. El-Ansary and Stern (1972) defined power as the ability to influence the decisions of another team member. In B2B contexts, power is defined as the ability of a business to influence the marketing decisions of a transaction partner. Hunt and Nevin (1974) define power as a company's ability to exert influence or control on the decisions and behaviors of other businesses. An organisation is considered powerful if it is able to exercise some kind of influence or control on the decisions and actions of others.

A more extensive definition of power is offered by Pfeffer and Salancik (1978). According to their studies, the ability to inflict penalties gives someone with power the possibility of accomplishing its own goals, even if these are at odds with others'. An organization's reliance on the resources of other organizations opens the door to this kind of punishment. This also means that any company with a sizable source of money has an advantage over other companies. This may lead to an even greater dependence—corporations have leverage or power to the extent that other businesses are reliant on their resources. In addition to this elaborated concept, Pfeffer and Salancik (1978) also suggests that the capacity to direct strategic resources inside a business gives someone power. The amount of resources an organization has to negotiate with, on the other hand, reflects its negotiating power.

Power Balance

The terminology of "power balance" is repeatedly mentioned in the reviewed papers. It was discussed that "power relation is the result of power difference between the power positions of a buyer and supplier" (Kähkönen 2011). This difference, especially when significant, could lead to an imbalance in the relationship with plausible adversarial consequences for the less powerful, and a potential abuse from the more powerful. This difference, or imbalance, or asymmetry, when perceived and identified, could be the first step towards mitigating the future collaboration risks for both parties.

In some of the reviewed papers, the notion of power imbalance is described along with its possible causes and consequences. Gaski (1984) suggested that in a bilateral connection partners' dependence often results in a power imbalance and advantage for one side, which may restrict the autonomy and behavior of the other party. van de Ven and Poole (1995) added that power balance is a relative concept and, consequently, whether a negotiator is in a strong or weak position can only be determined by his adversary. According to Casciaro and Piskorski (2005), power imbalance is described as "the difference in the interdependence of two players, or the ratio of the more powerful actor's power to that of the weaker actor." In another study, (Chen et al. 2016) propose that power imbalance is associated with trustworthiness of counterparts, the danger of opportunism (resulting from a party's own trade risks) and the risk of mutual hostage taking resulting from the counterparts' exchanges. Cousins and Crone (2003) suggest that a dependent relationship is a one-sided, negative connection in which the power imbalance works against the weakest partner.

Given the description above, we observe that it is not always easy to identify where power lies within a particular relationship, notably among supply chain actors. A company might not even be aware of their position of power relative to their counterpart. When they are aware of any power imbalance the presence of this imbalance will not automatically lead to power abuse (Cox et al. 2001). The literature has not only described power aspects in the supply chain, but has also helped in the identification of circumstances in which power is exercised, abused or left unused.

Table 2. Definitions of power adopted by the reviewed articles' authors

What is power?	Reference to original author
• A has control over B because A can persuade B to do something B otherwise would not.	Dahl (1957)
• The actor's capacity to persuade someone to behave in a way they otherwise would not. • Dependency is regarded as the source of power. • Actor A's dependence on Actor B is negatively correlated with the availability of A's goals out of the connection with Actor B. • A fundamental principle of power is that it is always there, even when actors do not want to use it.	Emerson (1962)
• The capacity to influence another member's decision-making factors • A company's capacity to influence a transaction partner's marketing choices	El-Ansary and Stern (1972)
• The capacity to exert influence or control over the choices and behaviors of other companies • The capacity to control or restrict another's conduct	Hunt and Nevin (1974)
• Possibility of achieving one's own objectives, even while in opposition to others, based on the capacity to impose penalties. An organization's interdependence on one another's resources makes this punishment conceivable. • One that represents a significant income stream has sway over another. • To the degree that other companies rely on their resources, corporations have power. • Power is derived from the ability to direct strategic resources inside the company. • Negotiating power represents the sum of resources available to an organization.	Pfeffer and Salancik (1978)
• The capacity to direct or influence the conduct of others by a person, group, or organization was first defined in the social and political sciences. • One partner's dependence on the other frequently results in power imbalances and advantages for one side, which limits the other's freedom and limits its behavior. • Persistent influence on the actions and decisions of others by a single channel member.	Gaski (1984)
• A company's capacity to possess and manage key assets that enable it to appropriate and build wealth by continuously leveraging its customers, rivals, and suppliers.	Cox (2003)

The Sources of Power

The next term being repeatedly used across the database is 'power source' which we understand as the characteristics that define a power structure and allow for it to develop. The term has been discussed in supply management research in the context of dyadic buyer-supplier interactions (Kähkönen 2015). Maloni and Benton (2000) suggest that in supply chains, power source is often classified as 'mediated power' and 'non-mediated power.' Reward and coercion are examples of mediated power sources. The buyer utilizes reward power to persuade suppliers by providing reward that the supplier may find attractive, while the buyer employs coercive power to induce supplier fear as a result of this disadvantage. Non-mediated power sources are more relational and optimistic in nature, including referent power, which is based on the parties' emotional and personal connection, and expert power, which indicates the buyer's expertise that the provider recognizes (Zhao et al. 2008). To further the discussion of power source, other authors elaborate further; for instance, Kähkönen and Virolainen (2011) also categorize power sources into three broad categories based on the context in which they arise: organization, relationship and network. Because of these differences of power sources, one should understand how various power sources may influence collaborative behavior and, therefore, performance (Nyaga 2013).

We identified several sources of power explicitly discussed within particular articles (Table 3). Among the widely discussed power sources are: resources & asset specificity (35 articles), mediated and non-mediated power sources (23 articles), and network positions (17 articles). There are 80 articles that do not use the term of 'power source' explicitly; however, some do indicate that because a decision-maker "moves first" (in a game-theoretic setting) they will gain the upper hand over their counterpart. Of all articles that mention the term 'power source' or 'source of power' 56 that do not specify these terms in any detail.

Table 3. The list of power sources identified in the articles[4]

Power sources	Frequency
Resources & asset specificity	35
The five power sources (theory of French and Raven 1959, 2016)	23
Network positions	18
Market power	16
Information & know-how	12
Dependency	11
Number of substitutes & alternatives	9
Industrial associations	8
Intellectual property	7
Quality standards	7
No specific definition of 'power source', however an actor is considered to have an upper hand when they can "move first" in a Stackelberg game or decision-making	80
The term 'power source' is mentioned but not explained in detail	55

3.3. The Plausible Impact of Power on Inter-Organizational Decision-Making

The definitions of power (Table 2) already reveal that power may impact supply chain decision-making. To understand this proposition better, below we examine how plausibility of impact is established in the literature.

Some articles share very similar references and propositions. For example, some articles refer to the proposition of Gaski (1984) that having power means that you can have an impact on how other people behave and make decisions. This proposition highlights the behavioral aspect of supply chain operations that may be altered depending on what power structure is in place. Similar ideas are proposed by Jonsson and Zineldin (2003) who suggest that power refers to the capacity to affect another's perspective, behavior, or decision-making (p.7). Power is also described as the capacity to exert influence on an external organization's decision-making behavior (El-Ansary and Stern 1972, Zhao et al. 2008, Yeung et al. 2009, Cai et al. 2013, Shou et al. 2013). When a company has power, it means it has the capacity to influence the choices and actions of other

[4] Note: this table only shows the number of documents that mentioned the keyword of 'power source' or 'source of power'.

companies, or to impose its will on them regardless what their actual will. (Brown et al. 1983, Hunt and Nevin 1974, Mohr et al. 1996).

Since 'behavioral shift' is difficult to observe without a certain measurement, a few articles have proposed to look into this through the decision variables that shift whenever a power situation is in play. For weaker actors, decision variables will likely shift and conform to the will of a more powerful actor. In fact, Emerson's power-dependence theory, which is repeatedly referred to across our database, suggests that power may be exercised without encountering any opposition or resistance at all, because the weaker party—the one who is most dependent on the resources of another party—will conform to what the powerful actor wishes. This tendency of conformity may include a shift in the decision variables later on. As an example, El-Ansary and Stern (1972) address power as the capacity of a company to shape the marketing decisions of a channel transaction partner.

Another stream of studies regard 'power' and 'control' as two distinct concepts. French and Raven (1968), in respect to this, suggest that power imbalance does not always lead to power exercise or power abuse. Power is seen as a latent concept, inherent to a certain relationship environment, while control is the explicit action that arises out of it. According to Frazier and Antia (1995), power refers to a party's capacity to influence its partner's decision-making, while control is a result of achieving that power. A party having authority may opt to refrain from enforcing it over the actions of the other.

More specifically, a few articles refer to the proposition that power could particularly influence the likelihood of collaborative actions such as joint decision-making to happen. This will depend on how both parties perceive power structure—whether it is seen as a threat or an opportunity—and how far they can leverage the existing power structure to redistribute incentives within transactions. Cox et al. (2003), for instance, suggest that power has an effect on: 1) the two parties' expectations for the commercial share they should gain, and 2) their willingness to engage in future joint operations.

Most ideas identified across our database typically assume that buyer is seen as the more powerful member of a dyadic relationship who can influence the decision-making of their supplier. This is probably because a buyer has purchasing power over the supplier, thus they play a key role in sustaining the supplier's business. The concept of 'buyer power' is repeatedly highlighted across literature as the ability of a buyer to influence a supplier's choices (Brown et al. 1983, 1995, Goodman and Dion 2001). In another example, Frazier and Summers (1984), suggest that power in supply chains is reflected in a big purchasing firm's potential influence on another in terms of activities, perception, and decision-making. On the other hand, we find few examples of studies where a supplier or a more upstream actor is seen as the more powerful member of the supplier-buyer chain.

Even though, in this study, we focus on a one-directional influence of power upon decision-making, we also take note of ideas that suggest it to be bi-directional. Although there is a contrasting lack of references, some articles refer to Bourgeois and Eisenhardt's (1988) proposition that ideally, decision-making takes into account politics, which is essentially a conscious effort to shift or increase power. This power-shifting effort is triggered by power inequalities. This idea has yet to be explored in depth, but has lent us the possibility to consider that it is likely for an actor to shift power imbalance when they factor in power-related information in their decision-making process.

Theories Used to Explain the Power-Decision Relationship

Although many articles discuss the impact of power on decision-making, there are differences among them when it comes to the theoretical perspectives they use. We first identified the complete list of theories used as a lens to examine power aspects within supply chains. It is found that the theory used most frequently of all is game theory. Table 4 indicates that game theory (80 articles) could be the one of the very few, if not the only mathematical modelling approach used to depict power structure. The other theories are adopted from multidisciplinary backgrounds, such as resource dependency theory (27 articles), transaction cost theory (23 articles) from economics, and power theory (19 articles) from sociology.

Table 4. List of theories used throughout the reviewed articles[5]

What theory was used to describe power?	Frequency
Game theory	80
Resource dependency theory	27
Transaction cost theory	23
Power theory	19
Network theory	13
Social exchange theory	8
Agency theory	7
SCM theory	7
Organization theory	6
Social network theory	4
Coordination approach	3
Grounded theory	3
Social relations/embeddedness	3
Green SCM	2
Value network theory	2
Capacity development theories	1
Classical microeconomic theory	1
Cognitive evaluation theory	1
Collective agency theory	1
Conflict spiral theory	1
Finance redistribution theory	1
Formal inventory	1
Information economics theory	1
Institutional theory	1
Labour process theory	1
Marketing theory	1
Neyman–Pearson theory	1
Opportunistic behavior	1
Point values theory	1
Property rights theory	1
Resource advantage theory	1
Signaling theory	1
Social structural theory	1
Theory of exchange	1
Theory of global commodity chains	1
Theory of merchandise buying behavior	1
Theory on interorganisational trust	1
Not specified	52

While Table 4 demonstrates the sum of all theories used, Table 5 shows co-occurrences of a theory and a specific power source in a particular article. Through a theory used as a lens, one may investigate power and break this construct down into several sources as independent variables.

From these co-occurrences, Table 5 indicates that "game theory" is the most frequently used theory when it comes to explaining power structure in supply chain settings. However, it is not co-occurring with any specifically mentioned source of power. In game theory studies, the sources of power are often not investigated in depth. The common assumption used in game theory studies is that the most powerful actor in a game theory setting is the one who "moves first" in a decision-making. In other words, the actor who is able or has the privilege to declare its expectations or alternatives or criteria to another actor can then affect how the rest of the decision-making process goes, ultimately affecting the outcome of the decision Note, however, that the term "power" is often used in game theory studies without significant discussion about definitions or the concept of power itself. The second most frequent co-occurrence of a theory and power source is "resource dependency theory" along with "resources" or "asset specificity". The third is "network theory" as the theory along with "network positions" as the power source explained. The fourth is French and Raven's "power theory" along with "power sources".

[5] Note: Articles that do not refer to a particular theory were not included.

Table 5. Power sources and according to theories across review study

		Sources of power											
		Resources & asset specificity	The five power sources	Network positions	Market power	Information & know-how	Dependency	Number of substitutes & alternatives	Industrial associations	Intellectual property	Quality standards	Not specified	Grand Total
Theory	Game theory												80
	Resource dependency theory	19					6					2	27
	Transaction cost theory	5		1		7	1	3				6	23
	Power theory	3	6				4				2	4	19
	Network theory			13									13
	Social exchange theory		7									1	8
	Agency theory			1				1				5	7
	SCM theory				2							5	7
	Organization theory		2									4	6
	Social network theory		2									2	4
	Coordination approach								2	1			3
	Grounded theory											3	3
	Social relations/embeddedness							1				2	3
	Value network theory			1		1							2
	Green Supply Chain Management											2	2
	Capacity development theories	1											1
	Classical microeconomic theory											1	1
	Cognitive evaluation theory		1										1
	Collective agency theory			1									1
	Conflict spiral theory											1	1
	Finance redistribution theory				1								1
	Formal inventory theory											1	1
	Information economics theory					1							1
	Institutional theory											1	1
	Labor process theory				1								1
	Marketing theory				1								1
	Neyman–Pearson theory											1	1
	Opportunistic behavior											1	1
	Point values theory									1			1
	Property rights theory											1	1
	Resource advantage theory	1											1
	Signaling theory		1										1
	Social structural theory											1	1
	Theory of exchange											1	1
	Theory of global commodity chains			1									1
	Theory of merchandise buying behavior					1							1
	Theory on interorganisational trust	1											1
	Not specified	5	4		11	2		4	6	5	5	10	52
	Grand Total	35	23	18	16	12	11	9	8	7	7	55	281

Decision-Making Mode

We examine the mode of decision-making, being either a joint decision or individual decisions. Below we investigate what leads a decision-maker to involve or not involve others in their decision-making, and whether this is associated with power structure at all.

Jointly made decisions are those that include criteria proposed by collaborating actors, such that actors need each other to make the decision.[6] On the other hand, individually made decisions do not allow involvement from others in a decision-making process. This may be due to power imbalance, such as when a buying firm does not see a supplier as a possible partner for strategic collaboration because the they are not dependent on a supplier's capacity and resources. Another reason could also be lack of trust and perception of threat which hampers the involvement of a more powerful actor in a decision-making. This perception could result in a vigilance of a weaker actor and its tendency to protect its own interest by leaving out the criteria of other actors in its decisions.

Table 6. Decision-making mode

How is this decision made?	Frequency
Individual	23
Joint	153
Not identified	49

In Table 6, the row "not identified" means that the paper does not specify what kind of supply chain decision is observed, or that the paper does not specifically address detailed decision-making aspects in organizations, even though it does discuss the power aspects.

4. Discussion

Throughout the set of 281 reviewed journal articles, we find that supply chain related decisions have been discussed and associated frequently together with power aspects. The key observation is that power can have managerial consequences, one of it being the way companies make supply chain decisions. Below, we will draw the insights from these reviewed articles. We provide a synthesis of the literature on the role of power in inter-organization decision making and discuss the gaps in the literature that provide opportunities for new research.

4.1. Supply Chain Decisions: Recurrent Themes and Domains

Although the notion of power is prominent in the B2B supply chain literature, few have been explicitly addressing the mechanics of power in a collaborative decision-making process. In this section, we investigate in depth how actors approach each supply chain decision provided an initial perception of power structure. To do that, we first list the type of most frequent supply chain decisions that occur in our database (see Table 7). Then, we further observe the sequences and characteristics of each of these decision processes, along with their vulnerability to power.

In greater detail, below we elaborate some of these decision types along with examples on how power structure may influence these decision-making processes and outcomes.

Pricing Decisions

Pricing is the most frequent decision found throughout the reviewed articles, and it might also be the most frequent decision faced by companies on a daily basis. Throughout the literature, the pricing decisions have been mostly studied using game theoretical models. In these models, a given set of scenarios dictates the context of the power structure where these decisions are made. In many articles, the effect of power structure on pricing, price sensitivity, and profitability is studied within the given scenario where the manufacturer has X bargaining power and where the buyer has Y bargaining power and a proposition of a price scheme (Ertek and Griffin 2002).

[6] It also includes research that employed game theory methods. In a Stackelberg model, decisions are to some extent made jointly because both players contribute to shaping the outcome of a particular decision even when there is only one player who can lead or make the first move, while the other one follows. In Nash equilibrium models, players make the decisions simultaneously, where they make individual decisions in parallel.

Table 7. Supply chain decision types

Decision type	General description	Frequency
Pricing	Pricing is the process through which manufacturers calculate what they will get in return for their goods. Pricing is determined by a variety of elements, including production costs, raw material costs, and profit margins.	58
Sourcing & procurement	Sourcing is the act of locating commodities or services, enabling the planning of future procurement requirements, avoiding potentially risky scenarios that might jeopardize the operational functioning of production.	29
Product	Product decisions center around physical attributes of goods e.g. design, size, quality, specifications, lifecycle, range of products, packaging, as well as additional services related to the product.	15
Investment	Investment decision refers to how a firm's funds are invested into various assets to maximize returns for investors.	14
Alliance	Alliance decision centers around forming a long-term relationship based on mutual goals, such as to boost capabilities and flexibility, to gain technical input, to gain accurate planning, to secure demand, and to lower overall buying costs.	11
Sustainability	Sustainability decisions refer to areas such as design, operations, sourcing and logistics where firms integrate environmental efforts as well as social concerns into their decision making.	10
Quality	Decisions on quality refer to setting up minimum standardization or design for products and services and ensuring mechanisms to monitor performances so that they satisfy target indicators and customers	9
Inventory	Inventory decisions uses the information of raw materials, currency, and completed commodities, to eliminate cash flow problems and to minimize the likelihood of inventory shortages due to fluctuating demand.	7
Marketing channel	The decision of marketing channels entails the selection of channels that will be assigned the responsibility of transporting goods of value from manufacturer to customer.	6
General decisions	The term general decisions here is used to label supply chain decisions across the studies that did not mainly focus or literally state any specific decision, leaving out the details of what decision is actually being discussed.	45

Game theory is employed to solve the competitive pricing problems in the supply chain (Maet al. 2018, Jafari et al. 2017). The main goal is to help consider a sustainable supply chain management viewpoint that will be optimal for both the buyer and the seller. This is helpful to build optimum pricing strategies to increase profit margins for the entire supply chain under different power structures, both in horizontal and vertical context of relationships (Luo et al. 2017) and in face of relationship uncertainty (Gupta et al. 2019). However, in some cases, game theory is also employed to discover the conditions where first-mover may benefit the most (Chen et al. 2014).

Among the reviewed articles, Chen, Wang, Wu and Ni (2017) introduced the notion of pricing power. This power reflects to the condition where a company acts as the leader of the Stackelberg wholesale price decision, a model where an actor makes the decision first before another actor who follows suit. Other than Stackelberg models, pricing decisions are also studied, throughout game theoretical settings, using Nash equilibrium models when both actors can make decisions simultaneously, independent from one another.

Decisions of Quality and Standardization

The notion of quality appears across the reviewed articles in different forms, such as traceability, safety, a compliance to a certain quality standard. Quality is considered to be one of the resources where power could stem from. Quality as resources refer to various aspects depending on the industrial sector. For example, in the farming industry, quality is seen in the scale of the farm, the distance from the contractors, and the quality of the farm yields (Fałkowski et al. 2017).

Improving quality aspects is believed to be a way to improve the bargaining position within the supply chain. For example, the bargaining position of a given agent may result not only from its position to both the downstream as well as upstream sectors, but also the quality of farm throughput, along with other subjective factors such as actual farm performance and also the quality of relationship with collaborators (Swinnen 2007, Sauer et al. 2012, Gorton et al. 2015).

Past research has tested whether quality is a leverage to get what an actor wants, such as higher price. This leads to a perception that one can demand and might get a higher price when the quality of their products are better than the horizontal competitors'. Through econometric modelling, it is indicated that farmers who regard themselves as having a fairly "powerful position" in the food chain stemming from their products quality earn a higher milk price from dairy firms (Fałkowski et al. 2017). However, this perception that solely quality can lead to a more powerful position might overlook some pitfalls and other key resources needed to develop.

Nevertheless, the relationship between decision-making in quality improvement and power structure remains an important aspect worth observing. Past studies found that supplier and buyer are more contingent toward each other if the buyer's production quality is dependent on the components from supplier (Pai and Yeh 2016). In another example from the retail industry, it is found that private labels' prices and sales are not affected with major brands' competitive pricing strategies, because of private labels' known quality that generates customer loyalty. Customers are willing to pay for the perceived quality, stemming from the quality maintenance efforts and supported by marketing efforts (Wu et al. 2012).

Although quality is believed to be the resource advantageous for bargaining power, some other studies indicate an opposite direction of the relationship. In other studies, it is indicated that power might be one of the factors that shape the decisions concerning the quality of product throughput. The intertwined effects of power structure on five aspects of supplier performance (cost, quality, delivery, flexibility, and innovation) is, for example, studied by Terpend and Ashenbaum (2012). The competitive landscape across industries demand that actors offer premium products at competitive price (Ramabulana 2011).

Within the agriculture industries, for example, when a geographical indication standard is implemented, an extra public eye governance takes place along the supply chain, which requires companies to reallocate and refine quality standards between the public and private governance layers in order to prevent redundancies and to implement more consumer-oriented governance structures in dyadic ties. These changes might take place as actors attempt to balance one another with the private and public layers of governance (Fernández-Barcala, et al. 2017).

Such quality standards, imposed by not only business counterparts but also by the market, is inevitable, despite the apparent local variability and heterogeneity in agriculture industry. Additional pressure on farmers to adjust their production systems becomes an issue worthy addressing (Ireland 2004). Such an issue raises questions as to whether or not producers are being involved in a particular formation of specific standard, and whether or not they are merely the ones who suffer forced certification as a victim of powerful players who would like to give barrier to entry (Mithöfer et al. 2017). Another paper also addresses this question to discover the objectives of rigorous quality standards imposed by major brands as a power play aimed to control access to market, as opposed to the public reaction towards consumer safety and quality standards (Thompson and Lockie 2013).

These findings on quality decisions and its relationships to power structure leads to another question to explore. If access to market signifies power, one can argue whether their unique access to market can influence or dictate other players in the chain as well as the competitors to follow a specific quality standard in order to create an additional barrier to market. In short, power associated with market access might influence the way other actor's build their product quality.

Investment Decisions

The theory of transaction costs suggests that the hazards of transactional exchanges across companies lie within the non-transferable investment specific to assets (McEvily et al. 2017). These relational hazards will be mitigated if a company decides to invest in building or acquiring capacities and critical resources, so that it can reduce its reliance on other actors. Understanding the importance of access to critical resources, some companies proactively and unilaterally make investment decisions. Some manufacturers, for example, generate green products and make investments in green products independently, choose carbon emission reduction technologies, decide the wholesale price of these products and the greenness level of these in order to optimize their own profits (Liu, Yang, Wei and Zhang 2018).

However, investment decision-making sometimes is influenced in a coercive manner. It can be influenced by the power of a consolidated market, see for example (Amanor-Boadu and Starbird 2005). The low number of actors affects the power structure of the relationship, leading several industry actors to feel that they have to engage in specific interactions due to insufficient viable alternatives. Similar attitudes have been observed among vendors in sectors with strong downstream consolidations and restricted alternative partnerships (e.g., automobile, clothing, personal computers and agro-industries) which influences the investment decisions in relationship-specific resources, thereby impacting the willingness of suppliers to fulfil the relationship-specific standards requested by their downstream collaborators.

Decisions on Sustainability Efforts

Decisions on sustainability efforts relate to product characteristics such as quality, traceability and sustainability which influences quality, safety, cost and sustainability concerns (Mena, Humphries and Choi 2013). It also relates to trade-offs between sustainability efforts and (environmental / sustainable) value creation (Brennan and Tennant 2018). Power could influence the way companies make decisions on sustainability efforts (Xue and Zhang 2018, Dauvergne and Lister 2012, Sheu 2014). Also, power affects how actors manage their interactions and how it influences organizational reactions to the execution of sustainability efforts (Touboulic et al. 2014). Here, power dependence is important for recognizing compliance in sustainable supply chains and for defining effective relationship strategies for creating more efficient supply chains.

Sustainability efforts could develop a source of power, for example, through marketing features (environmental image, brand recognition, advertising) as referent power sources (Gielens et al. 2018). Sustainability can be an important, scarce, idiosyncratic and non-replaceable asset, a source of competitive edge (Chen et al. 2017). It is also indicated to have positive impact on the profitability of the company who executes sustainability efforts. With the extent of consumer awareness of the environment, the degree of greening of the commodity will increase, affecting the profit margin and total income of green manufacturers (Chen et al. 2017).

Other Supply Chain Decisions

Other operational and strategic decision-making which involve the inclusion of power structure in a dyadic settings discussed in the reviewed articles are displayed in Table 8.

Table 8. Other supply chain decision domains

Supply chain decision area	Supply chain decision terminology	References
Related to the provision of materials	Supplier selection	Perry (2014), Brooks (2017)
	Procurement	Sanderson (2009), Ireland (2004), Sheu (2014), Love (2005), Hingley (2008), Cox (2002), Jain (2016), Dey (2018), Essabbar (2014)
	Purchasing	Finne (2015), Kähkönen (2011), Mysen (2012), Jafari (2017)
	Sourcing	Ireland (2004), Burch (2013), Dauvergne and Lister (2012), Terpend and Ashenbaum (2012), Pai and Yeh (2016), Cox (2004a), Cox (2004b), Cox et al. (2004), Stanczyk (2015)
	Outsourcing	Ibrahim (2018), Bian (2017) Angkiriwang (2014), Pinnington (2009), Watson (2004)
Related to the keeping of materials	Inventory	Sharifi (2006), Ferguson (2003), Tyan (2003), Ryu 2008), Ertek (2002), Takashima 2016), Wang (2013), Dey (2018), Bichescu (2009), Tao (2018), Seyedesfahani (2011)
	Safety stock	Angkiriwang (2014), Zhai (2017)
	Stock level	Rehme,et al. (2016), Kembro (2017)
	Replenishment	Wang (2013)

During the last decades, these supply chain decisions have been increasingly investigated as the result of power play in a B2B context. Despite the extensive work in providing examples of decisions, the extant literature still poorly addresses fundamental questions of power. New research is needed to understand the mechanics of power beyond the current general assumptions.

4.2. Conceptual Framework

Building on the results and discussion above, we propose a conceptual framework that is sufficiently supported by the collective findings and concepts across our database. Empirical research will be needed to further test a number of hypotheses that could guide future studies. We propose the following:

1. In a B2B context, power structure influences the structure or process of supply chain decision-making

In the context of inter-organizational power hierarchies, the theory of power relations states that power, which is rooted in the interdependence of organizations, dictates how an actor behaves, how relational rules emerge, how tasks and roles are defined, and how hierarchies and statuses are labeled (Emerson, 1962). Based on our observations in the previous sections, it is implied across literature that power, which refers to various power sources and power bases, may also influence the choice between a collaborative and a joint decision-making process. In other words, we hypothesize that these decision-making mechanisms do not solely depend on the domain of decisions and the number of decision-makers involved beyond that, power structure might also play a substantial role in shaping how decision-making processes works.

Another strategy for analyzing the likely effect of power on inter-firm decisions is to use a game theory approach as in Bacharah and Lawler (1981). In a prescriptive sense, game theory research may provide an interesting perspective on power, in which power sources are used as a tool to achieve a desired objective in negotiations. Given this understanding, it is acceptable to believe that the structure of power affects decision-making, or that the two are linked in some way.

One interesting topic we propose to investigate in the future is if a company's choice to involve other supply chain partners in supply chain decision-making is contingent on their existing power structure. As drawn from Emerson's power-dependence thesis, which implies that power exercise may draw a diversity of reactions from another party, these reactions could manifest into several behavior, e.g., resistance or acceptance. It is worth examining whether the choice of accepting or refusing collaborator to involve in a joint decision-making would vary depending on perceived power structure, and ultimately, whether each choice leads to different outcomes.

2. In a B2B context, supply chain decision-making structure influences the decision outcome

Throughout the literature, it is understood that the decision-making process comprises many steps, which are: identifying the issue; obtaining information; developing possible solutions; assessing these options; adopting an action approach; and executing it (Witte et al. 1972). Schwenk (1984) adds ‘goal formulation' phase into the above process and categorizes the whole process into four phases: goal formulation, problem identification, creating possible solutions, and evaluation or selection. Further, Hossler and Gallagher (1987) describe three stages of the decision-making process: predisposition, search, and decision-making. Despite this exploration of phases in decision making process, however, there is a lack of discussion on how the decision-making process and its phases manifests itself differently across various inter-firm relationship structures.

Our study is inspired by Mintzberg et al. (1976) who examined the various structures of decision-making. The structure here refers to how the decision-making process cascades across organizational setting or hierarchy. In decision-making structures, the concerned decision-makers have agreed upon a set of explicit ‘ordered responses’ or involvement actions for a familiar decision that has been encountered in the past within the same relationship structure. Mintzberg also proposed variables to assess decision-maker involvement levels: (1) the phase in which they engage—is it early or late? (2) their degree of effort—are they willing to commit and execute? (3) how decision-makers perceives their effort, and (4) how frequently they participate in a decision phase.

Adding into this the notion of decision-making structure, we focus on joint decision-making to illustrate how decision-making processes flow through a collaborative relationship. It is worth investigating to what extent the involvement levels differ among decision-makers and how task involvements are assigned. We assume that companies involved do not always participate in the entirety of decision-making process, such as from problem identification through the final execution of and monitoring of the decision. For example, in a certain decision domain such as sourcing, company A as manufacturer may be interested to develop all feasible alternatives and weighing each of them with their own criteria e.g., price and quality requirements, before making the final decision. In this domain of decision, company A may not want to allow company B, their supplier, to be involved prematurely when setting the selection criteria. Only after the criteria and alternatives shortlisted, company A hands over the shortlist to company B and requests that company B assess the possibilities according to company A's stated criteria using their particular skills and knowledge.

Another scenario that might happen is that company A makes a decision of another domain, such as calculating the selling price. In this decision, company A decides to completely exclude company B to participate because, based on company A’s perception, company B’s participation will risk exposing their cost structure and inequitable margin, and thus may not add much value to their profitability as decision outcome. In this scenario, a joint decision-making does not happen, and it counts as an individual supply chain decision. Thus, these differences between making decisions individually versus jointly may lead to differences of outcomes.

3. In a B2B context, power structure may influence the supply chain decision outcome (and reversely)

Wilkinson (1981) believes that the level of satisfaction between two supply chain decision-makers may be impacted by the power balance between them. Since satisfaction level of decision-makers is one of the indicators measured upon the execution of outcome, it is consequently reasonable to propose that power, in a collaboration context, may impact the structure of decision-making as well as decision outcome.

Once plausibility has been investigated and tested, decision makers can benefit from it by building deeper awareness and judge whether they see power structure as a leverage or as a threat. Eventually, decision makers may reflect and evaluate the outcome of decision-making, providing insights that entice them to improve their decision-making structure and, ultimately, to shift their power structure which governs their relationships. As Driscoll (1978) put it, the decision maker's degree of satisfaction with the decision-making process may be gauged ex post. Decision makers may ask themselves whether the decision-making process was beneficial to them and whether they would alter the process in the future, and if so, what do they wish to achieve differently and how. For example, decision makers may wish to have more control in bringing consensus, enticing commitments, managing disputes, reducing resistance, and mobilizing actions with their collaborators. This desire to control possibly stems for the need to have more predictable and reliable decision outcome. It will encourage them to rethink their political design of power structure and perhaps create a strategy to alter that into something more advantageous. If both the tangible (e.g., profitability, efficiency) and intangible (e.g. satisfaction level) outcomes of decision-making are not as expected, for instance, this will provide grounds for decision-makers to invest in power shifting efforts to gain the most value out of their relationships. Figure 5 summarizes the above considerations.

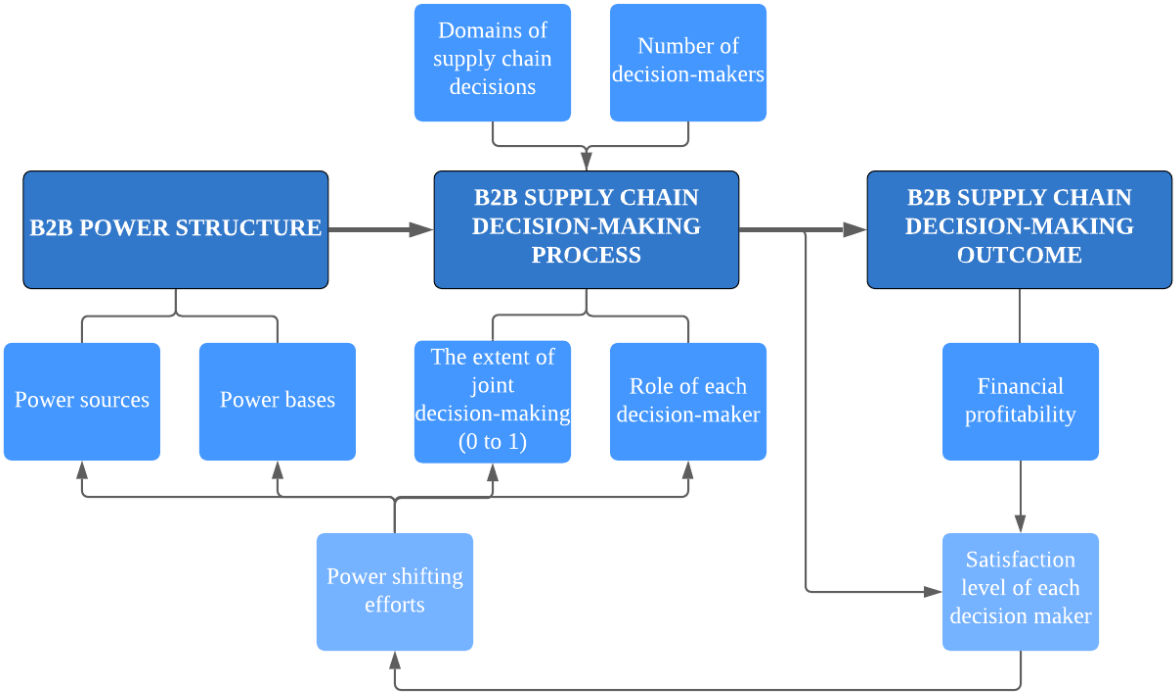

Figure 5. A representation of the power-decisions relationship framework

3.3. Research Gaps and Ways Forward

Throughout the literature review, several growing interests have been identified. Below we categorize these interests into seven major themes and provide a research agenda for each theme.

Theme 1: The formation and evolution of power relationships

The notion of power is closely linked to the resources of a company. Those with more resources are usually the ones who benefit from a more powerful position relative to its buyer or its supplier (Shou 2013). There have been examples where actors with upper hand position in resources attempt to benefit from their power even when it is at the expense of others. (Weston and Robinson 2008) suggest that the one who owns resources,

such as privileged information about end users, and whose core competency involves high level management skills will have more control throughout the supply chain, including the distribution of benefits. (Watson, 2004) also suggests that circumstances such as uncertainty and high levels of pre- and post-contractual risk are the underlying drivers to why a powerful actor reinforces its power over another actor. This is done through various means such as value appropriation and forcing other actors to bear costs upfront.

Resource dependence theory (Pfeffer and Salancik 2003) helps to illuminate this phenomenon and explains why those with resources can capture more value from transactions. This theory indirectly highlights the importance for firms to look at themselves, examine, and break down all the potential resources they can leverage as power over other members in their supply chains. Ultimately, the goal should be to have control on how to evolve in a certain power relationship so that it leads to a more desirable business outcomes.

However, shifting power balance is not always a priority according to a less powerful actor, at least in a short term relationship. Those who decide to stay in a non-favorable power relationship may have different reasons, mainly to survive as a business and to maintain a membership in a supply chain. Ideally, if weaker actors want to improve marginal profit, it only makes sense in the long term for them to explore ways to develop power to influence other supply chain members.

The literature has provided a few examples on how to shift this power balance. A first step that a weaker actor can take is to exploit the vulnerabilities of their more powerful counterpart, through examining contract which nature is usually open to updates and reinterpretation (Tokatli 2008). A second step could be to develop and encroach a core competence of the more powerful actor. For instance, Tokatli (2008) provides an account on how one of a dominant designer clothing retailer's supplier transformed itself into a strong competitor, by outdoing the retailer's strength in branding skills.

In a supply chain context, there is no such thing as an ideal, rigid form of relationship. There is always a fluid process of relationship formation, and this process is subject to change. The changes in a supply chain relationship depend on several factors, such as changes in marketplace environment, in organisation and also in key actors. Therefore, to understand a supply chain relationship, it is important to explore the possibilities of these changes (Hogarth-Scott 1999).

Research agenda 1: One of the potential factors of change in a supply chain relationship worth studying is how actors attempt to balance out power through strategic decisions.

Theme 2: Who leads the decision-making process in a power relationship?

When it comes to game theory research, there is no notion of stronger and weaker actors. Instead, the opposites are called the dominant leader and the follower. The dominant leader is always the one who decides first, depicting what the real-life stronger actor would do in a decision-making.

Nevertheless, past studies indicate that not only a leader or those who take the first step in a decision making can reap most benefits. In some cases, a leader of a supply chain is incentivized to purposefully act as a follower, by making a decision in the second step after compelling the other actor to make the first step to be in charge with a decision (Tao 2018).

Research agenda 2: Further studies may benefit from exploring the incentives and risks of different decision-making sequences, and how these sequences take place in face of an existing power regime.

Theme 3: How profit distribution changes when power shifts

In marketing research, some studies have been conducted under the fixed assumption that manufacturers are the leader, and the retailer is a follower. Meanwhile, some studies convey the opposite assumption. We propose that these rigid assumptions are challenged. Since power is fluid and can be manipulated through intervention, power can shift from manufacturers to retailers, and vice versa.

When a firm is more powerful than the other actors in its channel, it is generally assumed that it will reap more marginal profit than the counterpart. However, this is not always the case (Edirisinghe 2011). Shi (2013) suggests that this assumption only holds when the demand model has a linear expected demand, not a constant elasticity demand. When the latter model is in place, a firm experiences a declining performance if they become more powerful in its supply chain. This means that demand model will decide whether a powerful firm will gain more profit out of the power position, and, if yes, when.

In game theory research, it is also expected that in leader-follower models where power is imbalanced, the dominant leader who possesses more power will earn more profit than the follower. However, this assumption has not considered any external influences outside the scope of dyadic transaction. (Patra 2018) provides an example of a greening improvement decision, where the profit of a leader retailer is a function of not only the

greening investment by its manufacturer, but also its customer sensitivity to both greening improvement level and increased prices. This indicates that power relationship may not be the only thing that dictates how profit is distributed among actors.

In general, it is assumed that the weaker actor in a power imbalanced relationship always bears more costs or is less lucrative than the powerful counterpart. However, (Crook 2007) suggests that this is not always the case. Crook (2007) argues that the weaker member of a supply may also benefit from the relationship, especially when there is a reciprocal task interdependence. Unlike a sequential task interdependence where a powerful actor tends to have more room to exercise its power, a reciprocal, pooled task requires both actors working on it at the same time. A weaker actor may also benefit from a relationship when they develop a switching cost. Once the more powerful actor gets accustomed to a particular product or service, it strengthens a weaker actor's leverage of switching cost, making a powerful actor reluctant to change. A weaker actor can also deliver a good performance as a member of other relationships outside the focal chain and leverage this membership to get better SCM gains.

Power structure in supply chains is not always adversarial for the weaker actor. On the contrary, it can also positively influence the optimality of profits and supply chain decisions for both actors (Zhang et al. 2019). In a game theory setting, Zhang et al. (2019) studied that when an invested cost information of a follower is known by a dominant leader, the dominant leader may therefore stimulate the follower to modify or increase their investment by sharing his cost, therefore maximizing the overall supply chain profit margin. This creates a win-win situation favourable for both actors.

Meanwhile, some powerful firms recognize how exercising power can compensate for the vulnerability of their supply chain in retaining profits. In the study about Apple financial growth, Haslam (2013) explains that the profit of Apple is a function of power exercise over its suppliers by leveraging its outstanding market share. By looking at the percentage of revenue Apple represents in their suppliers, Apple is aware of the diversity of power relationships with its suppliers, thus the extent of power exercise is also dynamic and adjusted to how powerful a particular supplier is. Foxconn, for example, is dependent on Apple to bring 50% of its revenue, while another supplier Molex only receives 5% of its revenue from Apple. The extent of cost distribution in value creation and also value capture is different when Apple deals with a powerful supplier, Samsung, than when they deal with a financially limited supplier and app developers. By examining Apple's financial performance, one can see that the value capturing business model of Apple is the main contributor of its transformational financial growth. This practice, however, may leave a few suppliers suffer thin margins and force them to offshore to lower cost regions to maintain profits.

When discussing power balance and its impact to SCM gains of its members, it is noteworthy that the focus should not stay in the idea of sharing the pie. More importantly, it is important to work on expanding the pie. Although many decisions such as cost distribution in inventory, production, and transport are solved in a zero-sum approach, it may not be effective to solve other decisions concerning value creation and expansion. Product improvement and innovation should be continuous decisions shared by all concerned actors, with a dynamic distribution of tasks, investment, and also gains.

Research agenda 3: How profit is redistributed in a dynamic supply chain relationship with the ever-shifting power balance thus remain a question worth addressing in future studies.

Theme 4: Self defence against adversarial power exercise

One of the remaining questions in the consequences of exercising power is why there are weaker firms who agree to collaborate in a chain even when there is only small gain, or in the worst case, adversarial impact to revenue. One of the reasons could be that it is a function of control and force exercised by another member in the chain.

However, past studies indicate that the exercise of power does not always result in an expected outcome. The success of power exercise will also depend on the preferred power bases—the way in which power is exercised. Chen et al. (2016) found that suppliers would be more likely to share information and knowledge when they perceive a buyer to have an expert power. On the other hand, suppliers will be discouraged to share the same information if the buyer exercises a coercive power to get it instead.

For the weaker member of a chain, it is important to prepare a preventative measure to hinder the powerful member in exercising control. Product category, for example, may influence the extent of power exercise in a SCM relationship (Sutton-Brady 2015). In their studies, it is argued that a strong product portfolio and brand name may balance out retailer power over its weaker manufacturer. It will also hinder big retailers to exert maximum power knowing that they depend on certain product brands and product categories more than the

other. It is particularly relevant in cases of FMCG retail where retailers are generally not averse to exercising coercive power to get more SCM gains.
Research agenda 4: It is critical to investigate preventive methods that may be used to divert the exercise of absolute power and to safeguard the benefits of a weaker actor.

Theme 5: What does hinder the firm to make certain decisions?

Franco (2017) suggests that relative power is one of the factors that determines the level of attractiveness of a supply chain member to make joint decisions in radical transformation and innovation. The study provides an account of how a company is reluctant to co-innovate and transform its linear production line to a circular one when there is a huge power gap with its partner. This may become a concerning issue especially when there is already a shared vision in place, but power perception gets in way of co-innovating.
Research agenda 5: It is worth studying the repercussion of power exercise and relative, asymmetrical power perceptions in the efficiency of joint decision making.

Theme 6: Why are different power structures needed to govern different markets and products?

Throughout the set of 281 reviewed journal articles, we find that supply chain related decisions have been discussed and associated frequently together with power aspects. The key observation is that power can have managerial consequences, one of it being the way companies make supply chain decisions. Below, we will draw the insights from these reviewed articles. We provide a synthesis of the literature on the role of power in inter-organization decision making and discuss the gaps in the literature that provide opportunities for new research.

To govern different products and markets with different characteristics, different power structure might be needed. Past studies highlight the assumption that a power strategy that works with one market/product might not be suitable for another market/product. For example, when it comes to a geographical indication (GI) product (e.g. prosciutto ham, champagne, Gouda cheese), the power of public quality control is added within the GI supply chain. The public quality control plays the role of an intermediary power between a country (supplier) and a private firm (buyer), such that the interaction is driven by market-orientation (Fernández-Barcala, González-Díaz and Raynaud 2017). This changes the power structure entirely compared to the typical commodity and food retail supply chain due to an addition of intermediate actor between buyer and supplier.

The following is another example of power structure change that is needed when it comes to influencing a certain product decision. Dey (2018) suggests that for producing greener products, where its marginal cost may be higher than its developmental cost if compared to other general existing products, a powerful retailer may not have a great influence over a manufacturer to decide the product greening level. Oppositely, in a manufacturer-led Stackelberg game, retailers are allowed to retain their strategic inventory therefore improving the marginal profit of both actors while improving the product greening level. These examples show that when there is a power imbalance, the weaker actor will comply in providing greener product as asked by the more powerful actor. Interestingly, in a Nash equilibrium, the marginal profits for either of both actors are suboptimal. This means that for producing greener products, an extent of power imbalance is better than a total balance, even when this is not the case with other existing products where power balance might lead to more favourable outcome.

In supply chains of agriculture and forest products, which general characteristics is that it is produced by rural agrarian farmers, it is also important to recognize the power structure. The concept of a nested market, where actors isolate themselves from global market to conduct transactions locally, is then introduced to empower local actors to as a self-protection mechanism. This, in turns, balances out the power relations within the supply chain (Grivins 2018) because one giant, powerful actor, is deliberately dismissed from the equation.
Research agenda 6: More research is needed to understand the adapted changes needed to be done in buyer-seller power structure depending on the characteristics of market or product concerned.

Theme 7: On conflict management

Conflict is likely to happen in a power imbalance setting. To reduce conflicts, it is necessary to examine the triggers by which conflict may arise. Generally, in both vertical and horizontal relationships, a collaborative decision making is preferred. Wallenburg (2016) suggests that joint action is considered effective in conflict reduction when power is symmetrical. On the other hand, information sharing being the less invested form of collaborative action is equally effective to reduce conflicts in a cooperation with asymmetrical power.

One of the main origins of conflicts in an asymmetrical power situation is the over-dependence on another or more actors (Liu and Wang 1999). On that note, it is important for an actor to avoid over-dependence. In the case of a manufacturer, this means building a direct sales channel that does not require a distributor to interact with customers and end users. This can also be done in parallel with the use of the designated distributor services at the same time. (Liu and Wang (1999) added that unclear formalisation of business contract is also another origin of potential conflict. To address this issue, it is worth noting that all actors in a relationship should know what is expected of them by one another in a congruent manner. All perceptions and working conceptions (e.g. market information, product range, and functions) need to be made congruent as much as possible.

Research agenda 7: Beyond aiming to achieve optimal outcomes out of a relationship, both buyer and seller in a B2B setting need to adapt with all forms of power structure, both symmetrical or asymmetrical, such that potential conflicts can be mitigated. More studies are needed to explore the potential conflicts, consequences of these conflicts on supply chain operations and ways to manage these conflicts, given a certain structure of power.

5. Conclusion

The paper presents an analysis of the literature and conceptual framework, addressing the interaction between the power structure and supply chain decision-making. To conduct this study, we used text analysis and network visualization of significant themes and keywords, examining 281 peer-reviewed research articles published in peer-reviewed journals between 1994 and 2020. A thematic analysis was carried out to identify research gaps and to track the growth of the literature. We find that when it comes to business-to-to-business (B2B) interactions, power structures have a big role in how companies make decisions. A business may use power derived from a variety of sources to influence the course and the result of supply chain decisions. We were able to address different ways in which power works and also identify the most common decision domains in the organizational power literature: price, quality management, sustainability and alliance building.

Further, we examine previous research indicating the plausible influence of power structure on supply chain decision-making. We also identify predominant terminology and theories used in the literature to discuss power. We have highlighted the impact of the inter-organizational power structure on supply chain decision-making, both in terms of decision process and decision outcome. In addition, we find which recurring supply chain decision areas that have been discussed most often across the literature.

With this article, we aim to make a contribution by giving a clearer picture of how power structures affect supply chain decision-making and by suggesting 7 new topics and research objectives for further study as potential directions for future investigation. This research should aid managers and decision-makers in better understanding the power structure in the supply chain. It may assist managers in seeing potential risks or opportunities that may have an impact on future choices about the supply chain.

The literature indicates that supply chain-related decisions are subject to various power influences and power structures that govern the actors. We are not aware of any empirical studies about when and how actors get involved in joint decision-making, especially when power imbalances exist. Game theory research does work with assumptions about decision sequences between actors. Although numerical analysis can be used to predict how phases of decision-making vary under different conditions of power balance, it appears that more empirical work is needed to measure and validate the comprehensive assumptions made in game theory research. One could address detailed questions challenging usual assumptions made in game theory concerning the influence of power on decision-making processes. This could be a potential avenue for future researchers to explore. Here, relationships between power sources and perceptions, decision-making process and decision-making outcomes should be investigated, especially in the case of extreme power imbalance between companies across various industries.

This paper also highlighted the important gaps in the power structure research in supply chain context. There has been a lack of exploration in the potential aspects of power such as:

a. Actors' misperceptions of power structure circumstances → how accurate is the actor's self-perception of power structure compared to the reality? How could actors tell if their power is balanced enough or imbalanced?

b. Power-shifting tactics and actions to achieve goals → how might accurate perception of power help actors to formulate power tactics suitable for their supply chain goals?

Finally, we propose a research agendas with hypotheses to be tested on the following topics:

1. The way actors try to balance power via strategic choices is an important driver of change in a supply chain relationship.

2. The incentives and threats of various decision-making sequences and how they take place in face of an existing power system.
3. The issue of how profit is shared in a dynamic supply chain relationship with a constantly changing power balance should be investigated.
4. Identifying preventative measures to deflect the use of absolute power and protect the interests of a weaker actor is important.
5. How unequal power perceptions and exercise have an impact on joint decision-making efficiency.
6. How power structures shift or adapt so that they suit the need of certain market or product in question.
7. The effects of conflicts on supply chain operations and how to manage them in light of a particular power structure.

Further studies are needed to address these questions and provide empirical evidences to develop the existing organizational power theories, as well as to contribute to the knowledge for practitioners.

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