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**Cooperation and Conflict: A Law and Economics Analysis of
Meta-Organizations**

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A Law and Economics Analysis of Meta-Organizations

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Een rechtseconomische analyse van meta-organisaties

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ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA



Universität Hamburg



*Habe nun, ach! Philosophie,
Juristerei und Medizin, und
leider auch Theologie
durchaus studiert, mit heißem
Bemühn. Da steh ich nun,
ich armer Tor! Und bin so
klug als wie zuvor.*

*Ah! Now I've done
Philosophy, I've finished Law
and Medicine, and sadly even
Theology: Taken fierce pains,
from end to end. Now here I
am, a fool for sure! No wiser
than I was before.*

Faust I - 354ff.

Johann Wolfgang von Goethe

Foreword

As this dissertation concludes my academic education, I must accept that studying more and more not necessarily makes one understand the world better. It only makes one realize more and more how little one actually knows about its functioning. Unlike Faust in Goethe's opus magnum I did not study philosophy, law, medicine, and theology but only computer science, economics, and some law. Nevertheless, I must just as well admit that my attempt to understand *was die Welt Im Innersten zusammenhält* was naive. However, my attempt fortunately did not end badly as Dr Faustus' did. This is to a great share thanks to the help and support of the people mentioned in the remainder of this foreword. Luckily, I listened to the advice and insights of these

people and not to the vows of this strange poodle I met yesteryear. This help and support made sure that I did not resign due to the naivety of my initial attempt, but that I concentrated my knowledge and skills on the study of a very small portion of this highly complex world. The portion that I have chosen is to analyze the phenomena of meta-organizations from an economic and legal view. The results of this work are compiled in this book, with which I am very happy. Therefore, I would like to use this opportunity to thank all involved people sincerely.

First of all, I would like to thank my two supervisors Klaus Heine and Marco Casari for their support and advice over the course of my PhD. Great thanks to all my colleagues and friends within the EDLE-program who were not only a great source of feedback and inspiration but also enriched my time on and off work. I would also like to thank the administrative staff in Bologna, Rotterdam, and Hamburg who were always helpful and supportive when it came to manage the administrative burdens of a PhD-program comprising of three universities. Not forgotten should be my family and friends outside the EDLE-world that always encouraged and fostered me. Finally, I would like to thank Miriam who has always been there for me. Without her support and care this all neither would have been possible nor would make any sense.

Summary

Over the second part of the twentieth century inter-firm cooperations have become an increasingly popular phenomenon. These inter-firm cooperations often play out in the form of meta-organizations, which are organizations that are composed of the cooperating organizations. This thesis offers a new Law and Economics view on meta-organizations, contrasting meta-organizations with employment-based organizations in terms of the benefits and obligations involved. By integrating aspects from the fields of Law and Economics and Organization Science, the thesis contributes to the understanding of meta-organizations and their governance.

Meta-organizations can be characterized as a hybrid between market and hierarchy. Because of their hybrid form, meta-organizations are different from employment based organizations. This difference originates from their distinct membership compositions, and the associated rewards and obligations. The distinct nature of the obligations and rewards in meta-organizations impedes the applicability of governance mechanisms that are well established for employment-based organizations, such as the instruments building on formal authority or corporate governance. As a consequence, meta-organizations require specific governance mechanisms. This thesis presents two examples of such governance mechanisms. Third party decision making is viewed as an integral part of the meta-organization, implying that in this context arbitrators, for example, are a complement rather than a substitute to ordinary courts. Group selection may be relevant for cooperation within meta-organizations, with a larger pool of groups fostering cooperation through self-sorting of parties according to their willingness to cooperate, but also hindering cooperation due to coordination costs of finding a suitable group.

This thesis has built upon insights from both Law and Economics and

Organization Science in order to shed new light on the governance of meta-organizations. The findings of this thesis, based on an integrated use of multiple disciplines, show the relevance of broadening the paradigm within Law and Economics beyond neoclassical economics.

Contents

1 Introduction	1
1.1 From Entrepreneurship to Meta-organizations	1
1.2 Organizations and Internal Governance	7
2 Inter-organizational relationships in Meta-organizations	15
2.1 Inter-organizational relationships	15
2.2 Hybrid organizations	19
2.2.1 Hybrids between market and hierarchy	19
2.2.2 From hybrid- to meta-organizations	20
2.3 Meta-organizations: Differences to employment-based organizations	24
2.4 Corporate governance: Aims and authority	30
3 Meta-Organizations	35
3.1 Overview: Types of meta-organizations	35
3.2 Exemplifying by Joint Ventures	40
3.2.1 Legal background of joint ventures	40
3.2.2 Descriptive empirics on joint ventures	42
3.2.3 Case Study: Danone versus Wahaha	53
3.2.4 Arbitrated Joint Venture disputes	56
3.3 Hard and soft governance mechanisms	64

4 Conflict Resolution in Meta-Organizations	67
4.1 Third Party Decision Making in Meta-Organizations	67
4.2 Meta-organizations, Conflict and the Theory of the Firm . .	70
4.3 A Formal View on Third Party Decision Making in Meta-Organizations	76
4.3.1 Unanimous Surplus Sharing	79
4.3.2 Third Party Decision Making	81
4.3.3 Noisy Observability	87
4.3.4 Imperfect Enforcement	89
4.3.5 Lengthy Proceedings	90
4.4 Third Party Decision Making and the Boundaries of Meta-Organizations	91
4.5 Integral Part of Meta-Organizations	94
5 Selection of Meta-Organizations	97
5.1 Cooperation in Research Joint Ventures	97
5.2 Studying cooperation with laboratory experiments	104
5.3 Cooperation in sorted groups	106
5.4 Experimental Design and Hypotheses	119
5.5 Experimental Procedures	123
5.6 Experimental Results	124
5.6.1 Global behavior	125
5.6.2 In-group behavior	131
5.7 Partner-Selection: Sorting and Coordination	136
6 Policy Implications	141
7 Conclusion	165
References	167

A Appendix Joint Ventures	195
A.1 SDC Query	195
A.2 Announced joint ventures: Omitted data	196
A.3 Ownership in Chinese joint ventures	197
B Appendix Group-Choice	199
B.1 Nonparametric Tests: Wilcoxon-Mann-Whitney	199
B.2 Parametrization of weakest-link experiments	200
B.3 Regressions robustness check: Bootstrapping	201
B.4 Categorization in-group behavior	204
B.5 Contributions distribution	205
B.6 Subjects Demographics	206
B.7 Instructions Treatment G4-VCM	207
B.8 Instructions Treatment G4-WL	211
C Appendix Conflict Resolution	215
C.1 Nash bargaining under unanimous sharing	215
C.2 Individual maximization under unanimous sharing	216
C.3 Decision elasticity	216
C.4 Individual maximization under third party decision making	217
C.5 Noise in third party's decision function	218
C.6 Imperfect enforcement of third party's awards	219
C.7 Lengthy third party proceedings	221

1 | Introduction

1.1 From Entrepreneurship to Meta-organizations

When Guglielmo Marconi built his first radio telegraph in the late nineteenth century, he performed the necessary research, design, and manufacturing himself.¹ A modern mobile phone, on the contrary, is often not manufactured by the company that brands and markets it. Neither does this company generally design all the parts that the phone includes. Crucial components such as the processor, the battery, or the display are produced by specialized companies. However, this does not imply that these components are fully standardized products that are sold by the producer with equal specifications to multiple phone manufacturers. Imagine that the display of mobile phones would be a standardized component, then many phones in the market would look very similar since the shape of the display has a dominating impact

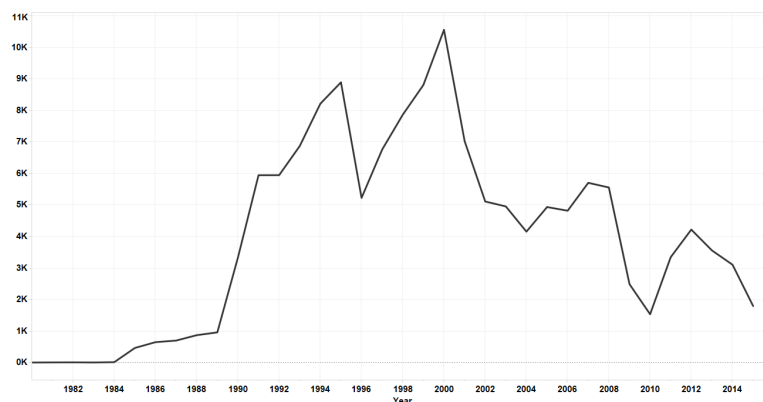
¹Guglielmo Marconi (25 April 1874, Bologna - 20 July 1937, Rome) is commonly known as the inventor of radio telegraphy (Jacot and Collier, 1935, 17-23,29-41). For his pioneering research in the field of wireless telegraphy he was awarded, together with Ferdinand Braun, the Nobel Prize in Physics 1909 (Royal Swedish Academy of Sciences, 1909). In 1897 Marconi founded the Marconi Wireless Telegraph Company (initially, until 1900: Wireless Telegraph & Signal Company) that was one of the most important manufacturers of wireless communication and broadcasting technology in the first half of the twentieth century. For example, with his company Marconi transmitted the first radio message across the Atlantic Ocean in 1902 and subsequently established the first transatlantic wireless telegraphy service between Europe and America in 1907 (Jacot and Collier, 1935, 102-119).

on the design of a mobile phone. Also the research that is necessary to develop the technology incorporated in modern mobile phones is not carried out solely by the manufacturer of the phone. Very often, companies jointly conduct research in order to share the associated costs and risks. Moreover, these companies are organized in industry alliances, such as the Open Mobile Alliance,² to develop and set common standards that allow the use of their devices across different networks.

Compared to the pioneer times of Guglielmo Marconi and other great inventors, companies nowadays need to establish many inter-organizational relationships to produce the complex and high-tech products that we use in everyday life. Figure 1.1 exemplifies this development by illustrating the number of newly announced joint ventures per year over the last 50 years. The graph shows a vast increase in the popularity of joint ventures in the mid 1980s and a second boom in the late 1990s. In the last decade, the number of newly announced joint ventures settled on a plateau of 3000 to 5000 per year. Joint ventures being only one specific type of inter-organizational relationship, this example illustrates the elevated importance of these arrangements in the last thirty years.

These inter-organizational relationships, as the name already suggests, rarely are pure spot transactions. This is because the exchanged goods or services are highly specific and hence generate a mutual dependence that poses a risk to both parties. To reduce this counter-party risk

²The Open Mobile Alliance was founded in 2002 by device and network providers, mobile network operators, content providers as well as other information technology firms, to be the standards organization for mobile services. The organization's system-level goal is to provide technical standards that ensure the interoperability of mobile devices, networks, and services world wide. The legal form of the Open Mobile Alliance is a British limited company, registered in the United Kingdom (Source: Bureau van Dijk, ID: GB03488861, via Wharton Research Data Services). See: Open Mobile Alliance, 'About Open Mobile Alliance', 2016. <http://openmobilealliance.org/about-oma/> - accessed on April 22, 2016.



Note: Data source SDC Platinum.

Figure 1.1: Number of yearly announced joint ventures

the parties seek to formalize the relationship and an accompanying stipulation of governance instruments. A common means for this formalization is the syndication of the related firms in a superordinate entity or meta-organization, such as a joint venture or a business alliance. While these meta-organizations are often set up with the legal form of a company, their internal structure differs fundamentally from regular companies. Regular companies are based on employment relationships whereas these meta-organizations consist of other organizations, namely various companies.³

³This is not to say that meta-organizations cannot employ employees, which they can and often do. The governance of these employment relationships is not different in meta-organizations. However, the distinguishing feature of a meta-organization is that it consists of organizations, which cannot be governed in the same way as employees. The analysis in this thesis focuses on the relationship between the meta-organization and its entity-organizations. In the same vein, employees of a normal company can also be shareholders of their company and hence an ownership relationship between them might exist. However, the primary relationship between the organization and the employees is the employment relationship, which sets normal organizations apart from meta-organizations. Thus, for the purposes of this research, employees' ownership in employment-based organizations is omitted. The reader interested in the topic of employees' control and influence ought to be referred to Cheffins (2000, 555-573). The difference between employment-based organizations and meta-organizations is discussed in greater detail in chapter 2.

The central research question of this thesis is: How do meta-organizations differ from employment-based organizations, from a law and economics point of view, and what different governance do they require? In order to answer this question, this thesis addresses various sub-questions. The first sub-question is how meta-organizations compare to employment-based organizations in terms of their organizational structure. This question is addressed with an analytical perspective derived from law and economics, and hence the focus lies on the rewards and obligations of membership to meta-organizations and employment-based organizations. The second sub-question is which types of meta-organizations exist, and how their typical membership structure looks. The next sub-questions focus on the distinct governance of meta-organizations. As a third sub-question, this thesis considers whether alternative dispute resolution mechanisms, in the context of meta-organizations, fulfill the characteristics of an internal rather than an external governance mechanism. Finally, this thesis addresses the question whether group-selection is a suitable governance instrument to establish and maintain cooperation within meta-organizations.

The difference between meta-organizations and employment-based organizations has an important impact on the branches of law that govern these organizations. While regular companies, or employment-based organizations, are mainly governed by labor law and corporate law (Collins, 2003, 10-12; Cheffins, 2000, 82-95, 217-221), meta-organizations are mainly governed by contract law and corporate law (Kraakman et al., 2009, 16-20; Prime et al., 1997, 62-66). This contrast, which is illustrated in Figure 1.2, directly determines which governance mechanism each form of organization is able to apply, since most governance mechanisms directly build upon the legal governance structure (Shleifer and Vishny, 1997, 750-753). This means that governance mechanisms which are well established in the sphere of employment-based organizations might not be adequate for meta-organizations.

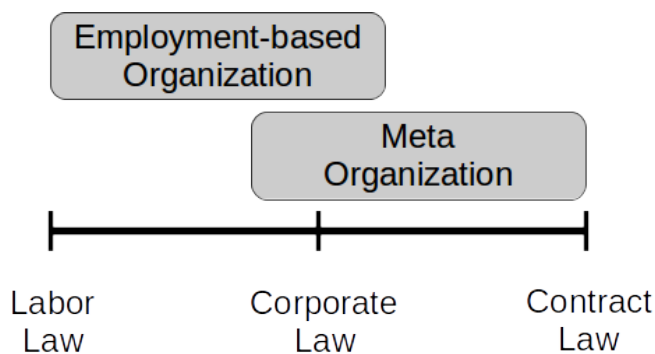


Figure 1.2: Relevant branches of law

Corporate law, for example, usually provides mandatory rules for the protection of the interests of dispersed or minority shareholders, such as specific board appointment rights (e.g. dedicates seats or over-weighted votes) and privileged access to information (Kraakman et al., 2009, 90-92). However, these protective rules are mainly focused on securing the shareholder value and therefore primarily concern the monetary interests of minority shareholders (c.f. Dyck and Zingales, 2004; Nenova, 2003). While this focus on monetary interests is generally not a problem for shareholders of an employment-based organization, it might be problematic in meta-organizational arrangements where the system-level goals of the comprising parties may go beyond profit maximization. The meta-organization may also be aimed at executing a specific activity, such as research and development in research joint ventures (c.f. Kraakman et al., 2009, 64; Prime et al., 1997, 98-106).

Not only the applicability of certain corporate law propositions but also the relevant branch of law that regulates the relationship between the entities is different for employment-based organizations and meta-organizations. The entities in an employment-based organization are the employees and hence labor law is the legal foundation for these relationships (Collins, 2003, 10). In a meta-organization, conversely, the entities are not employees but are organizations themselves, which in turn means that their relationship with the meta-organization is

governed by corporate and contract law.⁴ Because of these different types of relationships - on the one hand employment relationships and on the other contractual and ownership relationships - very different rights and obligations for the comprising entities arise. For instance, an employee has to obey the general authority of his or her employer in an employment relationship, whereas a contracting member of a meta-organization only has to fulfil its contractual obligations (Cheffins, 2000, 82-83). The lack of formalized authority in meta-organizations renders the use of governance mechanisms impossible that build upon hierarchy, such as the management's capability to issue directives or to apply the business judgment rule in employment-based organizations (c.f. Smith, 2016). Therefore, meta-organizations require other forms of organizational governance in order to maintain their operability and to meet their goals.

Governance is crucial for every organization in achieving its goals, because it regulates how the organization organizes itself and how it aggregates the individual decisions of its members. To this end, it is important that a given governance mechanism is aimed at the goals it is implemented to serve. Moreover, this implementation is based on the internal relationship structure of the relevant organization. Because meta-organizations have various features distinct from employment-based organizations, especially in respect to their organizational goals and the structure of membership relationships, governance mechanisms that work well for employment-based organizations might not work for meta-organizations. In order to suggest suitable governance mechanisms for meta-organizations, it is important to gain a better understanding of the inner functioning of this specific type of organization (Posner, 2010a). For this purpose it appears useful look into organization science for a definition of an organization and to identify character-

⁴Joint ventures, for example, can be formed in various legal forms, ranging from a contractual relation to a newly-established company with legal personality. Depending on the form chosen to organize a joint venture, various areas of law apply, the main areas being contract law and corporate law (Palmieri, 2012).

istics that are important for the internal governance of an organization (Posner, 2010b).

1.2 Organizations and Internal Governance

When talking about firms, one often refers to the term organization as a synonym. This is because a firm is a formation to organize the work of many in order to produce a joint outcome. However, for the purpose of this thesis it appears beneficial to consider the more abstract point of view that Organization Science takes on organizations. In this view an organization is a set of multiple agents, often people, that interacts as a single entity with its environment and that is defined by at least one system-level goal (Baligh, 2005, 1-3).⁵ For this interaction the organizational structure has to transform the agents' individual decisions into a single organization decision. To maintain the functioning of this transformation process and to ensure that it serves the organization's system-level goals, specific governance mechanisms are required (Gibbons and Roberts, 2013, 3-4; Calder, 2008, 1-2).

In the contemporary business landscape one can also observe formations to organize the efforts of firms, conversely to individual agents, towards a common goal. Joint ventures or business networks are examples of such formations that build a *meta layer* above existing organizations. Such meta-organizations are, therefore, organizations that themselves consist of organizations (Gulati et al., 2012; Ahrne and Brunsson, 2005, 9-14). This distinguishes meta-organizations from normal firms, or employment-based organizations, as these consist of individual employees. Because of the absence of employment relationships between the members and the organization, there is no strong

⁵Examples according to this definition are manifold. In this sense, everything from a football team to the United Nations qualifies as an organization. Here, however, the term organization will only be used for entities that serve a business purpose such as companies, joint ventures, or business networks.

internal hierarchy within a meta-organization. Moreover, for the members of a meta-organization it is usually very important to maintain their independence, which further hampers the establishment of formal authority in the top layer of the meta-organization.

The absence of formal authority as one of the main characteristics of meta-organizations poses substantial challenges to their governance systems (Gulati et al., 2012). These challenges occur since meta-organizations can only to a limited extent seize on the governance mechanisms of employment-based organizations as these mechanisms often require formal authority. For instance, the management of an employment-based organization exerts its formal authority to solve the problem of shirking in cooperative production transactions by monitoring its employees (Alchian and Demsetz, 1972) or to resolve disputes between organizational members with conflicting interests (Perrow, 1986, 131-133). Due to the lack of formal authority in meta-organizations, meta-organizations require different forms of governance mechanisms that do not rely on formal authority to solve and prevent intra-organizational problems. In sum, hierarchy as a governance mechanism is not effective in the context of meta-organizations.

A different view, however considers the inter-organizational relationships between firms as market-based relations rather than hierarchical relations (Levine and White, 1961; Hall et al., 1977). Such market-based inter-organizational relationships are governed by mechanisms that do not require formal authority. Nevertheless, these governance mechanisms are not perfectly suitable for meta-organizations either, because they usually only focus on the individual goals of the agents and hence disregard the subordinate system-level goals of meta-organizations.

This is illustrated by the following hypothetical example. Consider two companies in a joint venture for the development of a new class of mobile phones, which find themselves in a dispute regarding the technical

specifications. If the transaction between these two partners would be only market-based, then the terms of the transaction would be solely stipulated in the contract and every dispute regarding the transaction would be directed to an ordinary court for resolution. However, in the situation of a joint venture there are usually superior system-level goals such as perpetuating the business of the joint venture - in this example the successful development of the new mobile phone architecture. If the partners in a joint venture would submit their internal dispute about the specifications to an ordinary court, they would risk its public disclosure which might not only damage their reputation and the reputation of the joint venture but also disclose their intended technological advancement to the public. A reputation damage could have a negative impact on the actions of customers or potential investors and a disclosure of details about their development, in turn, could be useful for competitors that are working on rival products. Therefore, a public disclosure of the two companies' dispute on technical details would hurt the system-level goal, - to successfully launch the developed product, - of the joint venture. At the same time, however, the joint venture lacks an internal formal authority that can make a decision and resolve the dispute, because each party remains independent rather than being subjected to the joint venture.

As this example of a hypothetical research joint venture illustrates, it is vital for meta-organizations to employ governance mechanisms that accommodate their hybrid form between market and hierarchy (Williamson, 1991). Given their hybrid nature, meta-organizations cannot simply resort to proven governance mechanisms from either the market or a hierarchy. Instead, they require a suitable mixture of both that meets the specific characteristics of meta-organizations (cp. e.g. Figure 1.3). In the aforementioned example of the dispute between the two partners in a research joint venture, neither an internal decision maker nor an ordinary court could satisfactorily resolve the conflict because of the absence of formal authority and the existence of a superior

their independence (Teubner, 2009, 25-26) or the legal requirements of competition law⁷ (Kling and Burley, 1991, 2-4) may prevent the establishment of strict formal power with the meta-organization over business decisions of its members. Therefore, these meta-organizations have to rely on more market-based mechanisms to govern their cooperation. Before fully committing their resources to a single business network, a company could first join multiple candidates to survey the cooperativeness within those networks. After such a survey period the network with the most cooperative partners can be selected. Such a group selection mechanism is based on independent mutual selection and accordingly tends to be a rather market-based governance mechanism.

As the examples of third party decision-making in a research joint venture and group choice for business network selection illustrate, there is no single mechanism that is suitable for all types of inter-firm collaboration within meta-organizations. In turn, it is necessary to design a tailored governance structure for each specific meta-organization, considering the particular economic and legal context. The hybrid structure of meta-organizations between market and hierarchy requires their governance structure to be hybrid, too. As the examples further indicate, possible governance compositions can be rather hierarchy related as well as rather market related. This heterogeneity in governance structures demands a sophisticated understanding on the part of the policy maker when regulating meta-organizations.

This thesis offers a new law and economics view on meta-organizations, contrasting meta-organizations with employment-based organizations in terms of the benefits and obligations involved. By integrating as-

⁷For example, on a European level Article 101 of the Treaty on the Functioning of the European Union limits the type of agreements that undertakings may conclude with one another when these may prevent, restrict or distort competition on the market. Additional EU legislation specifies to what extent horizontal agreements for specific purposes are permitted, such as the block exemption regulations on research and development and specialisation agreements.

pects from the fields of law and economics and Organization Science, the thesis contributes to the understanding of meta-organizations and their governance. The thesis proceeds as follows. Firstly, chapter 2 contrasts employment-based organizations with meta-organizations. It shows that the difference between the two lies in the association relationship with the organization, which is an employment relationship in the case of an employment-based organizations, and a contractual or ownership relationship in the case of meta-organizations. It further argues that this difference has implications for the applicability of particular governance mechanisms, as these build upon the characteristics of the relationships within the organization. Subsequently, chapter 3 discusses different types of meta-organizations and empirically studies the popularity and membership structure of joint ventures, as an example of meta-organizations. This empirical analysis makes use of a newly compiled dataset on joint ventures over a time-span of the last 50 years. This chapter, moreover, provides a legal background of joint ventures and discusses types of disputes that are common to joint ventures, offering a starting point for the subsequent chapters on the governance of meta-organizations. The thesis then discusses two types of governance mechanisms that are suitable for meta-organizations. First, chapter 4 considers third party decision making as a means to resolve disputes within meta-organizations. It argues that third party decision making, such as arbitration, assumes the function of an internal governance mechanism and therefore lies within the boundaries of the meta-organization. This chapter thus puts forward an innovative perspective on the role of alternative dispute resolution in the context of meta-organizations. This perspective provides lessons as regards the role of alternative dispute resolution for the governance of meta-organizations. A second governance mechanism is discussed in chapter 5, which analyzes the importance of choice between various meta-organizations for the level of cooperation. This chapter considers how the availability of various meta-organizations allows parties

to self-sort according to their attitude towards cooperation, and finds that this positive effect prevails over the efforts to coordinate between the different meta-organizations. This chapter offers insights regarding the effect of group selection for cooperation within meta-organizations.

By the end of the thesis' main part it should have become clear what meta-organizations are and in what ways they inherently differ from employment-based organizations, from a law and economics perspective. This difference originates from their distinct membership compositions, and the associated rewards and obligations. The thesis will have illustrated how, as a consequence of this difference, meta-organizations require specific governance. Based on these contributions, chapter 6 introduces further research questions that arise from these findings and provides an overview of policy relevant issues. The thesis concludes with the final chapter 7 that summarizes the main contributions.

2 | Inter-organizational relationships in Meta-organizations

2.1 Inter-organizational relationships

The traditional view of economics centers around the market. Transactions on the market are the kernel of the analysis and the lion's share of economic theory concerns the question of the efficiency of these market-transactions. In this paradigm, firms are seen as individual actors that interact with their environment exclusively through the market. This market-transaction view defines inter-organizational relationships in the form of exchange relations (Levine and White, 1961; Hall et al., 1977). To regulate these exchange transactions, market governance primarily relies on contract law. According to the *exchange theory*, the sole purpose of relationships between organizations is to exchange values, such as goods, services, or money. While the exchange theory explicitly includes non-economic values as well, it neglects to conceptualize the power in inter-organizational relationships that is not based on market governance (Cook, 1977).

Markets are efficient in governing inter-organizational relationships if they are perfect and if the transaction does not require cooperation between the parties. In a non-cooperative transaction on a perfect market no actor has the power to set prices above the marginal costs

and hence each party in an inter-organizational exchange receives an efficient benefit from the relationship. However, a set of conditions has to be met for a market to be perfect and, accordingly, for the market to be a suitable governance mechanism for inter-organizational relationships. Moreover, it has to be given that the relationship requires no cooperative transactions, from which one party could derive power over the other. The conditions for this include the absence of monopolies and monopsonies (Friedman, 1962, 120-123), perfect market information and hence the full verifiability of all transactions (Akerlof, 1970), the inability to specify all assets including the absence of relationship-specific investments (Joskow, 1987), as well as the non-existence of any public good problem. Such a public good problem exists, for example, with intellectual property (Pigou, 1924, 151). A violation of these requirements provides individual parties with additional power, which they can use to extract the quasi rents from the transaction (Klein et al., 1978). In economic theory a *rent* is a profit that is entirely driven by the demand for a production factor or good because its supply is fixed and hence inelastic, such as land (Ricardo, 1817, 49-76). A *quasi rent* is a return based on a non-permanent inelasticity of a good from causes such as market power, patent protection, or the specificity of assets (Marshall, 1938, II.IV.12). In the context of inter-organizational relationships such inelasticities occur when an asset is specific to the relation between the organizations. Imagine a machine that can only be used to produce specific parts for a single customer, no other customer has use for these parts. If this single customer decides not to purchase the parts from the producer anymore, the specific production machine becomes valueless to the producer. This dependency gives the customer power in the relationship with the producer, which can be abused to extract the relationship's quasi rent. As this example illustrates, markets provide insufficient governance for inter-organizational relationships when the nature of the transaction yields power to a single party in the relationship.

The most straightforward remedy for a failure of market governance is to integrate the respective organizations into a single entity. In an integrated organization, all actors are subject to a single hierarchy, which is governed primarily by corporate law rather than contract law. Such a hierarchical governance concentrates all power at the top of the hierarchy, which prevents the extraction of quasi rents (Klein et al., 1978; Alchian and Demsetz, 1972). Because the actor at the top of the hierarchy is the beneficiary of the organization's residual profit, he uses his decision power to maximize the joint profit of all intra-organizational transactions. However, although hierarchical governance mitigates problems with autonomous adaptation capabilities, coordination efforts and principal-agents problems, the governance costs of a hierarchy are increasing in the size of the organization. These increasing governance costs limit the scope of integration as a remedy, particularly in respect of organizations that conduct transactions with multiple other organizations.

Assume an organization X that carries out transactions with the organizations A and B via imperfect markets. To pursue the integration remedy X, A, and B would have to be integrated into a single organization. If now A would additionally transact with another organization Y, then Y would also have to be integrated into the supra-organization. This logic implies that all organizations in an imperfect-market transaction-network should be merged into a single organization. Imagine, for instance, a single, very large, universal technology company just to standardize USB-sockets. Since such a super organization would be subject to very high hierarchy costs, it would not be feasible. Therefore, real-world organizations more and more seek hybrid solutions in between market- and hierarchy-governance.

Hybrid governance solutions are particularly beneficial for inter-organizational relationships in the form of research collaborations (Vonortas, 1997a,b) or for the purpose of foreign market entries (Agarwal and

Ramaswami, 1992). One of the major vehicles for the governance of these relationships between multiple organizations are joint ventures (Oxley, 2013, 3). Given their prevailing role, joint ventures are also an eligible proxy to empirically illustrate the growing importance of inter-organizational relationships world wide.⁸

Joint ventures are not only a good proxy to illustrate the global rise of inter-organizational relationships but also a good object of study for research on inter-organizational relationships on the intersection between economics and legal science. This is because both disciplines provide reasons for the existence of joint ventures, which are mostly interdependent and hence are best studied in an interdisciplinary context. For instance, the need of companies that engage in inter-organizational relationships to manifest their cooperative relation but at the same time preserve their legal independence, is driven by limitations of the laws governing these relationships. These limitations are the inability of contract law to precisely stipulate all aspects of a transaction and the fact that corporate law grants the management more formal authority the more integrated an organizations becomes. These properties of the legal system create different benefits and costs of inter-organizational cooperation, which have to be balanced while designing the relationship between the cooperating organizations. One approach to achieve this balance is to set up a purpose-specific organization, for instance a joint venture, that consists of two or more independent and separate organizations, the joint venture partners. Such a *hybrid organization* (Williamson, 1991) utilizes the constructs of corporate law (hierarchy-like aspect) to provide legal security for the cooperative transactions between the partners but simultaneously limits the forfeiting of independence to the contractually defined purpose of the relationship (market-like aspect).

⁸A descriptive empirical analysis of the growing importance of joint ventures follows in the next chapter, section 3.2.2.

2.2 Hybrid organizations

2.2.1 Hybrids between market and hierarchy

Various challenges in the current business environment require firms to collaborate with each other more often. Such inter-firm collaborations are, for example, necessary to enter new markets or to draft common standards for newly developed technology (Ring and van de Ven, 1992; Hagedoorn and Hesen, 2007). They are, moreover, vital for smaller firms to join their research efforts in order to compete with large-scale corporations (Tsakanikas and Caloghirou, 2004). The inter-organizational relationships of these collaborations are only in very rare cases purely market-based interactions (Hagedoorn, 2002). This is because the stakes are usually high (Becker and Dietz, 2004) and the nature of the relations makes them vulnerable to exploitation (c.f. Klein et al., 1978; Williamson, 1981). Two key drivers of this potential for exploitation are the necessity to share trade secrets and the importance of relation-specific investments. To remedy these threats to cooperation, the affected firms seek to increase the formality of the relationship and hence their *de jure* as well as their *de facto* security, without completely integrating into a single organization and having to submit their decision-making power to a centralized authority (Oxley and Silverman, 2008). To master this trade-off between formalization of the relationship and preservation of their legal independence, hybrid forms are created that fall in between the classical dichotomy of market and hierarchy.

In a seminal paper Williamson (1991) is the first to elaborately discuss the hybrid organization, defining it as a distinct type of governance structure that lies between market and hierarchy. His starting point is that organizations have to adapt to changing situational contexts in order to survive, and that organizational types vary in their capacity

to adapt accordingly. He distinguishes two types of adaptation, autonomous and cooperative, which mirror the two generic governance structures of market and hierarchy. In particular, in the governance mode 'market' autonomous adaptation works best to address changes, whereas in 'hierarchy' cooperative adaptation is most efficient. The hybrid organization, as a combination of market and hierarchical features, has the advantage of being reasonably suitable to tackle both types of adaptations. As a result, it depends on the particular situational context which governance mode is the most suitable to keep an organization viable (c.f. Emery and Trist, 1965).

Hybrid governance is a form of inter-organizational governance in which all activities related to the inter-organizational transaction are integrated into a distinct organization while, at the same time, the cooperating entities remain independent organizations. Such hybrid organizations are intended to combine the advantages of both the market and hierarchy as governance forms. (Williamson, 1991). Because the activities that are related to the inter-organizational transaction are bundled in the hybrid organization, hierarchical governance mechanisms can be utilized to prevent that single parties can draw power from interactions that require cooperation. This cooperation governance enables the hybrid organization to perform cooperative adaptations in a changing environment. At the same time the individual members of the hybrid organization preserve their autonomous adaptation capabilities because they remain independent organizations. To constitute this hybrid governance structure, a composition of contract law and corporate law is used.

2.2.2 From hybrid- to meta-organizations

This combination of contract law and corporate law can be approached in two manners. On the one hand a hybrid governance structure can be

Attributes	Governance structure		
	Market	Hybrid	Hierarchy
Instruments			
Incentive intensity	++	+	0
Administrative control	0	+	++
Adaptation capabilities			
Autonomous	++	+	0
Cooperative	0	+	++
Contract law			
Contract law	++	+	0
Corporate law	0	+	++

++ = strong; + = semi-strong; 0 = weak

Source: Adaptation from Williamson (1991, 281).

Table 2.1: Distinguishing attributes of market, hybrid, and hierarchy governance

seen as contractual relationships that are complemented with corporate ingredients, and on the other they could rather be seen as corporate structures that are attenuated by contractual instruments to retain the autonomous adaptation capabilities of the involved parties. Examples of the first are industry consortia or franchise systems, and the latter are, for instance, joint ventures. While industry consortia are mainly contractual agreements, they often employ a joint and several liability clause which is an instrument of corporate partnerships (Milton, 1980, 125-126). Franchises are also contractual agreements, in this case between a franchisor and franchisee which are both legally independent entities. However, the franchise contract grants the franchisor specific control rights over the franchisee, such as the right to determine the location of the business or to make decisions regarding pricing, advertisement, business processes, or employee training. These attributes are usually only found within hierarchical, corporate organizations (Emerson, 2013, 650-653). Conversely, joint ventures are usually created as distinct legal vehicles with an internal hierarchy. Nevertheless, the parties remain legally independent entities besides their cooperation within the joint venture, using the joint venture contract as a strategic

instrument to govern their relationship (Salbu, 1991).

An alternative definition of hybrid organization is proposed by Schanze (1993), who names these structures 'symbiotic arrangements' since they are mutually advantageous to all involved parties. Besides the difference in name Schanze agrees with the definition of Williamson that these organizations are an intermediate in the dichotomy of market and hierarchy. He names the founding contract of such hybrid-symbiotic organizations, such as a large investment project, "constitutional" contracts.

This view of the modern firm's fuzzy boundaries is confirmed in the seminal contribution of Zingales (2000), in which he notes that "the nature of the firm has changed" (Zingales, 2000, 1640). Modern as opposed to traditional firms are not large business corporations that are vertically integrated and asset-intensive with a strong central authority, but are rather human-capital intensive organizations that are not vertically integrated and lack a strong formal authority. This drift away from a central authority for complex business endeavors requires the entrepreneur in a modern organization to secure its power by different means than through the hierarchical relationships that prevail in classical organizations. The analysis and perspective of Zingales is general and not only focused on inter-organizational relationships, but nevertheless also reflects the impact of hybrid organizational forms upon the corporate landscape.

Hybrid organizational arrangements play an important role in modern day to day business. For example, by the end of the year 2014 869 out of 2,105 Ahold, a large retailer holding in the Netherlands, stores (Albert Heijn, Etos, Gall & Gall) were operated by franchises, representing 41% of the total.⁹ Joint ventures, franchises, or business networks are omnipresent in the contemporary corporate landscape

⁹Source: Ahold annual report 2014, page 34.

and not only in business to business transactions but also in business to consumer transactions. The role of hybrid organizations in the economic environment, incentives to *go hybrid*, as well as internal organizational challenges have been addressed in the literature on hybrid organizations (Ménard, 2013, 2004). However, this stream of literature often confines itself to the transaction costs view (Ménard, 2013; Grandori and Soda, 1995; Williamson, 1991). While transaction costs economics provides valuable insight in coordination problems of inter-organizational relationships, it neglects the segmentation of capabilities within these complex organizations (Langlois, 1992). Since the key capabilities of a business strongly influence the distribution of power within each organization, transaction costs economics remains mainly descriptive on the issue of governance of hybrid organizations (c.f. Ménard, 2013, 1088-1093). Therefore, a more composition-focused lens, that concentrates on the composition of organizations that encompass multiple other organizations, could improve our understanding of modern inter-organizational relationships and their governance requirements.

Such a composition-focused lens is the theory of meta-organizations (Gulati et al., 2012; Ahrne and Brunsson, 2005). In this theoretical view inter-organizational relationships in the form of hybrid organizations are seen as meta-constructs (meta Greek: $\mu\eta\tau\alpha$; after or beyond) on top of cooperating organizations. Hence, a meta-organization is an organization that itself consists of organizations. This distinguishes meta-organizations from *classical* employment-based organizations, in which the members (i.e. the employees) are individuals and not organizations themselves (Ahrne and Brunsson, 2005, 4). Since the behavior of individual agents and organizations can be fundamentally different *ceteris paribus* (c.f. Anderson, 1999), the difference in member identity can lead governance mechanisms that are well-proven in employment-based organizations to fail in meta-organizations. For example, an individual agent might respond differently to liability when he is di-

rectly liable than in a situation in which his liability is pooled by an intermediate organization. In addition to this *methodological individualism* concern (c.f. Schumpeter, 1908, 88-87), the formal manifestation of a meta-organization might further hamper the use of traditional governance mechanisms. This is because the formal manifestation of a meta-organization is materially different from an employment-based organization. As the name already suggests, an employment-based organization is composed of employment contracts that form employment relationships between the employees (the members) and the organization (see figure 2.1). Meta-organizations, in contrast, are usually formed by contractual relationships that, while making the cooperating organizations members of meta-organization, are not as comprehensive in respect to rights and duties as employment relationships.

2.3 Meta-organizations: Differences to employment-based organizations

A meta-organization is an organization that comprises multiple legally independent entities (Gulati et al., 2012). This particular organizational design implies that the members, which create the organization, are legally autonomous and not bound to the organization by an employment relationship (Ahn et al., 2008, 142-148). Instead they are associated with the organization by contracts and or property, which means that their rights and obligations are defined in the specific contract or by the general provisions on ownership. This difference in the affiliation relationship distinguishes meta-organizations from employment-based organizations because both the rewards and the obligations from participation in the organization are elementary different (see table 2.2). While an employee in a employment-based organization receives a wage as compensation for his participation, the incentives that motivate a company to join a meta-organization

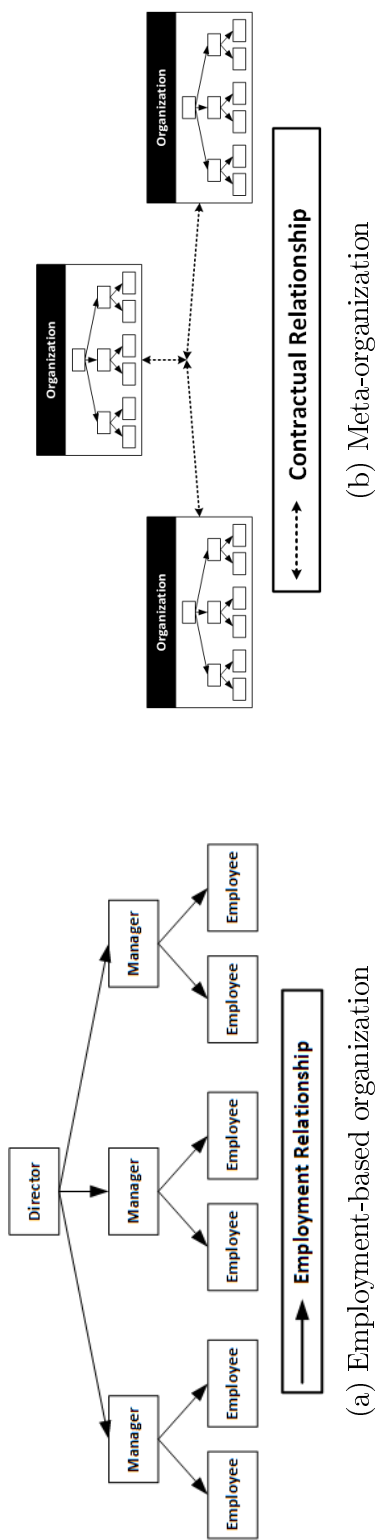


Figure 2.1: Relationships within organizations

	Employment-based organization	Meta-organization
Organizational objective	Maximize profit of residual claimant	System-level goal of involved parties
Membership relationship	Centralized employment	Dispensed contractual
Internal authority	Formal power	Informal power
Membership obligations	Generic <i>Chain of command</i>	Specific <i>Financial contribution, knowledge transfer</i>
Membership rewards	Distinct <i>Wage, amenities</i>	Diverse <i>Profit sharing, knowledge exchange, market access</i>

Table 2.2: Distinguishing characteristics between employment-based- and meta-organizations

can be very diverse. Gaining access to foreign markets or combining sales- and marketing-activities are intended benefits of participating in a meta-organization, just as obtaining intellectual property rights or the co-determination of future industry or technology standards. The obligations of participation are also different for employment-based and meta-organizations. By entering into an employment relationship with an employment-based organization, the employee accepts that the organization's management has the authority to give directions, which have to be executed by the employee. This authority is general and broad, going beyond what is explicitly specified in the employment contract in terms of the tasks and responsibilities of the employee (Arrow, 1974, 63-64). Conversely, in a meta-organization the members' obligations have to be either specified in the affiliation contract or are defined by corporate law. They are not by far as comprehensive and generic as in an employment relationship.

Especially the difference in the members' obligations distinguishes meta-

organizations from classical employment-contract-based organizations and has far-reaching implications for the requirements of an organization's governance system. To better understand this difference in obligations, a closer look at the origins of the employment relationship in classical organizations offers valuable insights. The contemporary employment relationship can be seen as a humanized modification of the system of serfdom, which was the prevailing governance form of labor in the European Middle Ages (Sweezy and Dobb, 1950). One important step in the development of modern labor law, the main legal body to govern employment relationships, was the British Master and Servant Act of 1867,¹⁰ which gave cause for an influential report by the Royal Commission on Trade Unions (Brodie, 2003, 1-2).¹¹ While the act marked the end of penal employment-law in the United Kingdom, the name Master and Servant Act forcefully illustrates which type of relation the legislator still had in mind when drafting the statutes (Hay, 2004). Not a relationship *inter pares* but a master as principal and a serving subordinate. This closely connects to the tradition of serfdom, in which the serf was in limited ownership of the master (Kahan, 1973). Owing the serf endowed the master with certain property rights, which we nowadays still have for things and certain intellectual works. Particularly the rights *usus* and *fructus* gave the master the formal authority to give work directives to the serf and enjoy the *fruits of his labor* (Weber, 1956, 626-627).

Without any doubt the development of labor law has improved the balance between the employee and the employer, as employment is nowadays voluntary and employees cannot be forced to work anymore. Nevertheless, the general arrangement of the relationship between the

¹⁰Master and Servant Act 1867 (UK) 30&31 Vict c 141.

¹¹'Eleventh and final report of the Royal Commissioners Appointed to Inquire into the Organization and Rules of Trades Unions and Other Associations: together with an appendix containing a digest of the evidence, correspondence with Her Majesty's missions abroad regarding industrial questions and trades unions and other papers.' Parliamentary papers (1868-1869), Vol XXXI (4123).

principal and the subordinate has remained mostly unchanged. An employer still has the generic rights to give the employee working directions and to enjoy the profits from his labor (Weise et al., 2002, 284-285). Because of this specific status of personal work relations, the law characterizes employment contracts as a distinct class of contracts and hence mandates specific status (Freedland and Kountouris, 2011). Examples from Dutch labor law of such statutes that apply to employment contracts but not to ordinary contracts are the prohibition of at will dismissal,¹² the limitation of the number of sequential fixed-term employments,¹³ as well as the determination of a minimum wage.¹⁴ Legal science names different reasons for this special regulation of employment contracts, such as the imbalance of power (c.f. Hogbin, 2006), relationship-specific investments (Vandenberghe, 2009, 2000), organizational effects (Houweling, 2012, 27-30), as well as the incompleteness of employment contracts and authority of employers (Collins, 2003, 10-12).

Employment contracts are concluded as future contracts, often for an indefinite period. Since the future can generally not be foreseen, the employer faces uncertainty about the assignments he has for the employee in the future. Therefore, employment contracts are necessarily incomplete and do not precisely specify the concrete assignments of the employee (Collins, 2003, 10-11).¹⁵ This incompleteness gives the

¹²Article 7:677 of the Dutch Civil Code stipulates that a party to an employment contract who cancels the contract without a pressing reason (*dringende redden*) is liable to pay compensation.

¹³Article 7:668a of the Dutch Civil Code specifies limitations to the number of sequential fixed-term contracts, as well as to the total duration of multiple fixed-term contracts. After more than three fixed-term contracts or when 36 months have passed, the contract is considered to be a permanent employment contract.

¹⁴Article 7 of the Minimum wage and minimum holiday payment/bonus (*Wet minimumloon en minimumvakantiebijslag*), and Article 7:626 paragraph 1 of the Dutch Civil Code (*Burgerlijk Wetboek*).

¹⁵Of course modern labor contracts provide a job description and state the general tasks of the employee. Nevertheless, specific assignments are usually not postulated in the labor contract. Therefore, the employee requires specific instructions from the employer in order to know what his concrete tasks are. For instance,

employer the necessary discretion to direct the labor to its most productive use (Collins, 2003, 10; Cheffins, 2000, 82-83). The directive discretion is especially important since the usual employer has more than only one employee and hence is required to coordinate their cooperative efforts. To transfer the incompleteness of the employment-contract into the competence of direction giving, the contract stipulates authority to the employer over the employee in exchange for a wage and also contingent rewards such as bonuses, promotions, or general career paths. Without this authority in the employer-employee relationship, the fulfillment of the contract would be at risk because the incomplete nature of the employment-contract makes it difficult for an external party (e.g. a court) to determine a potential breach. Thus, the stipulation of authority and the discretion to give the employee directives are vital to the exchange of labor and wage as they create a hierarchy within an employment-based organization. This endows the employer with the necessary flexibility of adaptation within a continuous and changing environment.¹⁶

By entering into an employment-relationship, the employee accepts certain restrictions to his legal independence and acknowledges the employer's power to take the decisions in all employment-related matters in exchange for a monetary compensation (Coase, 1937, 390-391). This

an IT-specialist might be hired by a large corporation to maintain its IT-systems. Without further directions from the IT-manager, the employee does not know which systems he should work on, or which problems he should fix first. These specific assignments only emerge during the term of the labor-relation and hence could not be specified at the conclusion of the contract. Moreover, when the employee is required to cooperate or coordinate with coworkers, he requires instructions from the employer to govern this cooperation or coordination (Collins, 2003, 10-12).

¹⁶One might object that the view on employment relationships expressed in this paragraph is not necessarily correct for modern employments, as these are nowadays also more task focused and comprise high degrees of independence for the employee. This is correct and, in fact, point to the reasons why the traditional governance forms of labor law increasingly struggle to define the appropriate scope for these modern forms of employment (see e.g. Countouris, 2007, 2-12). However, in the remainder of the chapter the term employment relationships will be used for employments in the classical labor law sense.

power gives the employer and hence the organization formal authority over its employees and enables the creation of a hierarchical structure. This hierarchy is the foundation for an effective management of the cooperative transactions within the organization (Simon, 1951). As a consequence, the governance systems of classical employment-based organizations are mainly aimed at maintaining and preventing the abuse of the formal authority to sustain this vital hierarchy (Armour et al., 2009).

Meta-organizations, on the contrary, are characterized by the absence of formal authority (Gulati et al., 2012, 573). This is a direct consequence of the members' requirement to preserve their legal independence. Because the members in a meta-organization are not willing to forfeit their legal independence, the organization is not able to attain universal decision-making power over its members. This means that the members' obligations towards the organization are not generic as in classical employment-organizations, but conversely that they have to be specified in the association agreement. As a result of these very specific, interdependent obligations, the internal structure of a meta-organization can only to a limited degree be based on hierarchical elements. This lack of formal authority and hence hierarchy has far reaching implications for the eligible governance mechanism for meta-organizations. More specifically, it means that the proven governance mechanisms of classical employment-based organizations, which concern the internal hierarchy, are not necessarily effective for meta-organizations.

2.4 Corporate governance: Aims and authority

In his landmark report Cadbury (1992, 15) defines corporate governance as “the system by which companies are directed and controlled.”

In this sense corporate governance can be understood as a set of legal and economic institutions that regulate the relationship between a firm and its owners as well as other stakeholders (Shleifer and Vishny, 1997, 738). Therefore, it is important in situations in which the ownership and the control of a firm are separated in order to ensure the owners' interests (Fama and Jensen, 1983b; Easterbrook and Fischel, 1991, 22-25). The prevailing reason for this importance is the existence of an agency problem between the owner (the principal) and the management (the agent), which originates in the information asymmetry between the principal and the agents in terms of specific knowledge and the verifiability of actions (Fama, 1980; Eisenhardt, 1989). In the absence of appropriate governance this agency-problem would enable the management to use its decision-making discretion to appropriate the residual profit from the owners (Fama and Jensen, 1983a; Shleifer and Vishny, 1997, 740-758).

The concept of corporate governance, traditionally, focuses on financial aspects (Cadbury, 1992, 15; Shleifer and Vishny, 1997). As the use of the term residual profit and the mentioning of the agency theory already suggests, the main focus in the traditional understanding of corporate governance lies in the protection of the financial interests of the owners (Cadbury, 1992, 9-10). This focus is also comprehensible as in the process of separating the ownership and the control of a firm, the role of the owner shifts from an entrepreneur to an investor. While the type of investor varies from small, private shareholders to large scale pension funds, investors generally are united in their aim to achieve a profit with their investment (Romano, 1993). As an efficient monitoring is usually difficult for disperse groups of investors, they rely on the corporate governance system and its institutions for this task (Monks and Minow, 2004, 195-202).

In the *Principal-agent theory* monitoring is a means to overcome the information asymmetry between the principal and the agent (Fama,

1980; Eisenhardt, 1989). In the context of corporate governance, monitoring accordingly means the supervision of the management. Therefore, monitoring assumes an important role in between the investor and the management in corporate governance. Thus, the corporate governance system provides different institutions for this important task, such as the supervisory board or rating agencies (Fama and Jensen, 1983b; Jensen and Meckling, 1976; Tirole, 2006, 16-18). Generally, these monitoring actors can be divided into two groups: internal and external monitoring actors. Internal monitoring, on the one hand, is done from within the firm from institutions such as the supervisory board that have access to the internal information flow but no executive decision-making power (Cheffins, 2000, 95-108; Monks and Minow, 2004, 195-199). On the other hand, external monitoring is performed by institutions as auditors or financial analysts outside the firm and hence strongly relies on financial information as mandated by the regulation regarding accounting practices (e.g. IAS, IFRS, or GAAP). This reliance highlights the focus of monitoring in corporate governance to serve the general goal of the investor to earn a financial profit.

Conversely, the focus of corporate governance on the financial interests of the investor or owner implies that other interests might not be adequately protected. This can be exemplified by Hewlett-Packard's (HP) takeover of Compaq Computer (Compaq). On September 3rd 2001, then HP CEO Carly Fiorina announced that HP and Compaq would seek to merge under the brand of HP.¹⁷ This takeover was followed critically by especially Walter Hewlett and David W. Packard, minor shareholders and sons of HP's founders. Both Packard and Hewlett campaigned against the takeover because they believed that it ran counter the company's core values as established by the founders. To illustrate this Packard named the massive employee layoffs planned af-

¹⁷See: HP Inc, 'Hewlett-Packard and Compaq agree to merge, creating \$87 billion global technology leader', 2001. <http://www8.hp.com/us/en/hp-news/press-release.html?id=230610#.VzCY0uZp2uM> - accessed on May 09, 2016.

ter the merger.¹⁸ They had a different strategic goal in mind for the company, and were concerned that Fiorina's management would expose the company to competition from aggressive, low-profit PC business. However, Packard and Hewlett lost the decisive vote on March 19th in a special meeting of shareholders.¹⁹ This vote was subsequently challenged in court by Hewlett.²⁰ Because of the law's neutrality towards business strategy, the takeover could only be challenged on procedural grounds. The court, however, concluded that Hewlett "failed to prove that HP disseminated materially false information about its integration efforts or about the financial data provided to its shareholders" and hence dismissed the claim.²¹ As this case illustrates, Hewlett was protected as a shareholder in his financial interests. However, he could not challenge the decision to merge with Compaq based on his strategic goal for the company.

The example of the HP-Compaq takeover illustrates that the corporate governance system through monitoring provides several remedies if the owner's goal of achieving a profitable investment is imperiled, but struggles when the owners following more complex, strategic goals (Cheffins, 2000, 609-614). As mentioned in the previous section, this is precisely the case for meta-organizations where the members usually follow complex system-level goals such as the development of new technologies or strategic market access. Additionally, members in meta-organizations are not only investors but also contribute to achieving

¹⁸The New York Times, 'Disgruntled Relatives May Seal the Fate of HP and Compaq', Steven Lohr, November 8, 2001. <http://www.nytimes.com/2001/11/08/business/technology-market-place-growing-group-disgruntled-relatives-may-seal-fate.html> - accessed on May 13, 2016.

¹⁹See: HP Inc, 'HP Announces Certified Vote Tally on Compaq Merger Proposal', 2002. http://m.hp.com/us/en/news/details.do?id=302538&articletype=news_release - accessed on May 09, 2016.

²⁰Hewlett v. Hewlett-Packard Co., Court of Chancery of Delaware, 2002 W.L. 549137 (2002).

²¹Hewlett v. Hewlett-Packard Co., Court of Chancery of Delaware, 2002 W.L. 818091 (2002), para. 16.

these system-level goals. This complexity in the goals and in internal relationships of the organization makes it hard to determine whether members of a meta-organization are monitored by the use of internal or external monitoring institutions. On the one hand the members are usually represented in the board of the organization and rely on external financial data, but on the other hand are they themselves subject to monitoring to a certain extent. Therefore, in contrast to employment-based organizations successful governance in meta-organizations requires a peer-monitoring mechanism that enables the supervision of the members' contributions to the meta-organization.

Besides the problem of monitoring, the complex relationship structure of meta-organizations has another negative influence on the functioning of traditional governance institutions. The executive board in employment-based organizations has the formal authority to take decisions on the strategic direction of the organization, based on the employment relations that constitute the organization (Monks and Minow, 2004, 254-256). The decision-making power of the executive board allows it to balance internal interests and resolve potential conflicts between, for example, different divisions within the organization. For meta-organizations the management usually lacks the formal authority to decide in case of disputes between different members as they are usually legally independent entities. Therefore, the governance of meta-organizations requires a conflict resolution mechanism to settle disputes in accordance with the system-level goals.

3 | Meta-Organizations

3.1 Overview: Types of meta-organizations

When joining meta-organizations firms often have to pool assets and give up control over key rights, raising the question why firms choose to do so in the first place. Firms may have different motivations to collaborate in a meta-organization rather than relying on pure market transactions or fully integrating. Several economic theories, such as transaction cost economics and agency theory, provide explanations for the existence of meta-organizations (Ménard, 2013, 1075) as will be discussed in chapter 4. In the first place, however, firms' reasons to join meta-organizations vary depending on the type of meta-organization that we are talking about.

This chapter provides an overview of the different types of meta-organizations. In a second step, it considers joint ventures as an example to provide a more detailed view of their characteristics and their legal classification. The chapter contributes to the understanding of the role and purpose of joint ventures by providing an empirical study on the popularity and structure of joint ventures. Joint ventures became very popular in the 1980s, but their popularity has declined since then. It is also found that over 90% of joint ventures consist of two members, and in 80% of these joint ventures each members owns 50% of the shares. Finally, this chapter studies disputes that arise in joint

ventures, setting the stage for the subsequent chapters in this thesis that focus on the governance of meta-organizations. The Danone vs. Wahaha case is considered in detail as a case study, and five additional arbitration cases are discussed that illustrate the typical characteristics of disputes in joint ventures.

In the previous chapter a meta-organization was defined as an organization that itself consists of organizations (see section 2.3). This definition does not tell us much yet about the character of the arrangement between the members of the meta-organization. In fact, meta-organizations can take different places on the spectrum of hybrid organizations between the two poles of market and integration, depending on the intensity of the coordination and the density of the rights shared (Ménard, 2013, 1073). A first type of meta-organization, the *joint venture*, is used to collectively engage in commercial activities, particularly when these activities involve a complex daily operation, substantial skills and technical innovation, or substantial financial risks or resources (Gale et al., 1998, 2). Joint ventures can be characterized as "simultaneously contractual agreements between two or more organizations and a separate legal (and usually organizational) entity with its own purpose" (Borys and Jemison, 1989, 245). Depending on the way in which the joint venture is established, it may resemble a contractual relationship or rather a more integrated arrangement (see further section 3.2.1).

Joint ventures are sometimes selected as an alternative to a licensing agreement or a *franchise*. In a franchise the franchisee has the right to use a firm's business model and brand name for a prescribed period of time within a geographical area. In exchange, the franchisor obtains a fee for the trademark, reimbursement for training or advice, and a royalty payment depending on the franchisee's sales. This royalty usually ranges from 3 to 7 percent of the annual franchise revenue (DePamphilis, 2013, 544). In addition, the franchisor retains con-

trol over pricing, marketing and standardized service norms (Todeva and Knoke, 2005, 125). The franchisee benefits from the franchisor's knowledge, experience, research, capital and reputation. By entering in a franchising relationship, the franchisee can run a business without having to invest substantial time and money to develop a successful business method (Emerson, 2013, 642). Franchises developed rapidly in the 1960s and 1970s in the provision of final goods and services to consumers, (Ménard, 2004, 348) providing a method for quick and inexpensive business expansion into various markets (Emerson, 2013, 641). Franchises reduce customers' search costs and allow the involved parties to benefit from joint marketing (Ménard, 2004, 349). A key element of franchises is that the partners pool certain property rights while abandoning part of their decision rights, in order to benefit from brand names and joint actions (Ménard, 2013, 1072).

A related type of meta-organization is a *collective trademark*, which is a trademark owned by an organization and used by its members to identify themselves with a common characteristic, such as a quality level or geographical origin. Collective trademarks usually arise on the initiative of suppliers and involve less monitoring and control than franchises (Ménard, 2004, 349).

Related to collective trademarks are *cooperatives*. A cooperative is a coalition of enterprises, often each small in size, that combine, coordinate and manage their collective resources (Todeva and Knoke, 2005, 125). Cooperatives can take a variety of forms ranging from market-like arrangements to quasi-integrated firms, making their characterization difficult (Ménard, 2013, 1072). Cooperatives usually rely on decentralized decisions and have to find ways to monitor and control the partners, for example when it comes to product quality or sharing the rents of shared property rights (Ménard, 2004, 350).

Whereas franchises primarily concern distribution, *buyer-supplier agreements* usually involve production. Buyer-supplier or supply chain col-

laboration has been defined as "two or more chain members working together to create a competitive advantage through sharing information, making joint decisions, and sharing benefits which result from greater profitability of satisfying end customer needs than acting alone" (Simatupang et al., 2002, 289-308). Buyer-supplier agreements facilitate the cooperation of participating members along the supply chain to improve their performance, for example in terms of revenue, costs and flexibility in production (Bowersox, 1990; Fischer, 1997). The aim of buyer-supplier agreements may be to coordinate quantity or quality (Ménard, 2004, 348). Buyer-supplier agreements require coordination across stages in the supply chain based on complementary activities or competences (Ménard, 2013, 1071). Parties remain autonomous and the cooperation is monitored by either a leading firm or a specific governing entity. As Ménard (2013, 1072) puts it, "[s]upply-chain systems benefit from powerful market incentives while providing tight control over key transactions, without the burden of integration."

Strategic alliances are generally more dense and extensive than buyer-supplier agreements in terms of shared rights (Ménard, 2013, 1071). Strategic alliances can be characterized as "relatively enduring inter-firm cooperative arrangements, involving flows and linkages that utilize resources and/or governance structures from autonomous organizations, for the joint accomplishment of individual goals linked to the corporate mission of each sponsoring firm" (Parkhe, 1993, 795). A strategic alliance generally involves two or more firms that contribute to one or more strategic areas and share the benefits and managerial control over the performance in these areas, while remaining legally independent (Yoshino and Rangan, 1995, 5). Strategic alliances are commonly used for the development or transfer of technologies and other R&D projects (Kotabe and Scott Swan, 1995; Mowery et al., 1996). A strategic alliance is distinguished from a merger or acquisition because the partners maintain distinct core assets and keep control over related property rights (Ménard, 2013, 1071). Strategic alliances may be

relatively close to standard contractual practices (Ménard, 2004, 350), although cooperation usually goes beyond spot or short-term agreements as partners jointly plan and monitor substantial activities, pursuing mutual benefits. Partners may provide the strategic alliance with resources such as funding, capital equipment, distribution channels, or knowledge, expertise and intellectual property. Strategic alliances often involve technology transfer or economic specialization, and as a result parties commonly share expenses and risk. For these purposes, a spot agreement of the market type is often inappropriate (Jorde and Teece, 1989). While some consider strategic alliances to include joint ventures, franchises and other varieties of inter-organizational relations (Todeva and Knoke, 2005), others define them separately. Those consider strategic alliances to be less involved and less permanent than a joint venture, for example. As a key distinguishing factor is named that in case of a joint venture the parties form a new, separate entity, while in a strategic alliance firms collaborate while remaining distinct entities.

Finally, firms may collaborate in a business network. *Network* is a very general term that covers about all arrangements involving a set of recurrent contractual ties among autonomous entities (Ménard, 2004, 348). In the context of meta-organizations, two particular types of networks can be distinguished that are not (fully) covered by the types already discussed above, namely trade associations and industry consortia. A consortium is seen by some as a contractual agreement, with participants normally not contributing assets to the consortium and not sharing in the profits of the consortium (Milton, 1980). Industry consortia often seek agreement among their members on the adoption of technical standards for manufacturing and trade (Todeva and Knoke, 2005, 125). Networks can also be established in the form of partnerships, such as associations of lawyers or other professionals. Partnerships may also be less formalized, as illustrated by teams of researchers from various universities (Ménard, 2004, 349). Partnerships

may be set up to deal with common pool resources or to set common standards. Partnerships usually have a broader purpose than consortia, which exist for a single undertaking or purpose (Milton, 1980, 124).

As we have seen, meta-organizations as a group differ from the firm as an integrated solution, but vary in terms of the degree of control over decision rights and ownership of assets. In a similar vein, the various types of meta-organizations differ from pure market interactions but vary in the degree to which are coordinated on a central level. Indeed, meta-organizations range from loose clusters of firms to quasi-integrated partners (Ménard, 2004, 348). In the following the focus is concentrated on a very common type of meta-organization, namely the joint venture.

3.2 Exemplifying by Joint Ventures

3.2.1 Legal background of joint ventures

Although the expression 'joint venture' is commonly used, in many jurisdictions a legal definition of the term does not exist (Bauer, 2015; Gillis et al., 2012, 35). The term joint venture may refer to all sorts of arrangements that constitute strategic entities or agreements between businesses. A joint venture can therefore cover several legal concepts, and in many jurisdictions a large variety of forms is available for setting up a joint venture. As a result, joint ventures as such are usually not regulated. Instead, the applicable rules depend on the choice of legal structure chosen for the joint venture. Moreover, the legal rules that apply to the different organizational forms are found in a range of different areas of law, in particular the areas of contract law, corporate law, intellectual property law, antitrust rules and tax law.

In most jurisdictions, a joint venture can be set up as a contractual joint venture or as a corporate joint venture. Contractual joint ventures are, as the name suggests, established under a contract which stipulates that each participant operates the business independently from each other. In this case, parties establish a cooperation or joint venture without forming a new legal entity. The parties to the joint venture agreement serve their common economic goal by carrying out their activities through the participating entities (Shuke, 2012, 1). Contractual joint ventures may be formed for specific projects to be carried out by multiple parties (Thió, 2012, 337).

Parties may also establish a corporate joint venture, which is a newly established economic entity governed by company law. In this form, parties to a joint venture become partners and shareholders of the new legal entity, which has legal personality. This has implications for the laws and rules governing the joint venture, and in particular has consequences for the liability regime that applies to the joint venture. A corporate joint venture independently assumes civil liability, whereas in a contractual joint venture each participant assumes civil liability for its own business (Sun and Sun, 2012, 94). Civil liability rules may be a reason for parties to choose to establish a joint venture in a corporate form rather than as a contractual joint venture. Another reason to structure a joint venture as a corporate joint venture may be that contractual rights are in general more difficult to enforce, in particular when it comes to joint decision making (Kusak and Temel, 2012, 101). Moreover, the joint venture often serves as a vehicle for joint funding, where both parties contribute with money or know-how.

Generally, all corporate legal forms available in a jurisdiction can be used to form a corporate joint venture. Often used corporate forms for a joint venture include a joint stock corporation, a limited liability company or a partnership. In many jurisdictions, such as the United States, there is no express restriction on the type of joint venture that

is allowed. In the United States joint ventures are generally set up either as contractual arrangements or as entities. In the last case, corporations or limited liability companies are most common, but various partnership entities are also permitted and often utilized (Dehner, 2015). Similarly, in Japan joint ventures can be set up as a contractual joint venture in the form of a partnership agreement, or as a corporate joint venture in the form of a stock company or a limited liability company (Nukada et al., 2015). In some jurisdictions a partnership joint venture is recognized as a separate type of joint venture next to contractual or corporate joint ventures, such as in China. In China, a corporate or partnership joint venture must be registered with the local branch of the State Administration for Commerce and Industry (Wu, 2015). In other jurisdictions, such as France, a joint venture without legal personality, for example established as a partnership, still qualifies as a corporate joint venture. In Australia, so-called incorporated joint ventures are registered as limited liability companies. In an incorporated joint venture, participants become shareholders of the joint venture company. In Belgium and Turkey a cooperation may qualify as a company as soon as the joint venture partners agree to bring in certain assets with a view to carrying out specific activities for profit. If parties do not wish to set up a distinct legal entity, they may set up a contractual type of company in the form of a partnership or temporary company. Similarly, in Turkey a corporate joint venture is formed as a result of capital contributions (Thió, 2012, 337).

3.2.2 Descriptive empirics on joint ventures

To gain a better understanding of the characteristics of joint ventures, this section provides a brief descriptive statistical analysis over the last last 50 years. The data for this analysis was obtained from SDC Platinum, a database on financial information.²² This data downloaded

²²For the precise SDC report query see appendix A.1.

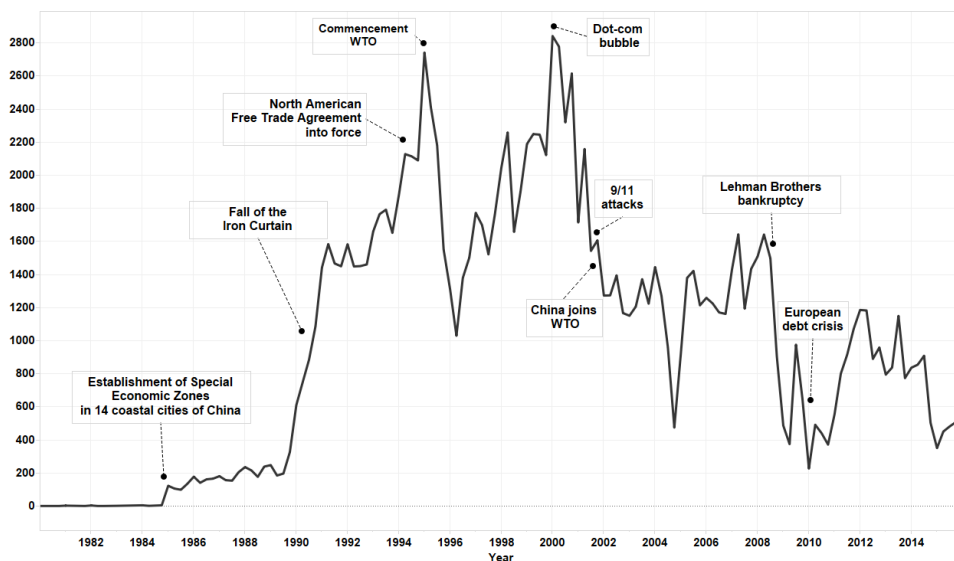


Figure 3.1: Number of quarterly announced joint ventures with events

from SDC Platinum was in a semi-structured format. In order to perform an empirical analysis, the data had to be pre-processed. For this a program was written to obtain the necessary fully structured format. The resulting dataset contains information on 144,953 announced joint ventures from November 1963 to May 2016. Besides the data of announcement and the name of the joint venture, this information also includes data on the nation, the main field of activity, and the members of the joint venture. The data regarding the joint ventures' members contains the nation of the individual member as well as its share of ownership in the joint venture alliance.

Figure 3.1 shows the development of the number of quarterly announced joint ventures between 1980 and today. The data for the years from 1963 to 1979 is deliberately omitted because the figures for those years are relatively so small that they are indistinguishable from zero on a linear scale.²³ The graph depicting the years 1980 onward shows that the number of announced joint ventures started to rise around the year 1985. This rise coincided with the introduction of

²³For a graph of these figures, see appendix A.2.

special economic zones in China under Deng Xiaoping (Ho, 2004, 103-104). Within the special economic zones foreign entities could invest into China under the premises that the business was carried out by a joint venture with a Chinese partner (Salem, 1981, 78). The number of newly announced joint ventures boomed during the fall of the Iron Curtain, during which establishing a joint venture with a local partner was one of the most prominent market entry strategies for Western companies in Central and Eastern Europe (Schuh and Holzmuüller, 2003, 179-180). This rally continued over the first half of the 1990s fueled by events such as the signing of the North American Free Trade Agreement and finally peaked at the time of the commencement of the World Trade Organization.²⁴ After a mid 1990s low, the number of announced joint ventures recovered towards the end of the decade and boomed again at the time of the emergence of the Dot-com economy. After the burst of the Dot-com bubble the number of newly announced joint ventures began to drop again and retained over the crisis following the 9/11 attacks. Moreover, many managers involved in joint ventures had experienced disputes and a lack of trust between the parties, which also contributed to a further decline in their popularity (Turowski, 2005). China's accession to the World Trade Organization also likely contributed to the figure's decline as the joining processes included commitments by China to abolish trade barriers such as mandating specific types of joint ventures for foreign market entry (Mattoo, 2004,

²⁴The peak at the time of the commencement of the World Trade Organization is interesting since both its rise and its fall are very steep. This steepness suggests the existence of particular reasons to establish a joint venture at that time. It is the author's hunch that the liberalization of foreign investment rules required to access the World Trade Organization can explain the spike in the number of joint ventures at the time of its creation. For example, the possibility to hold a majority ownership in a foreign joint venture in a country where this was not allowed before may have attracted many new foreign investors. Nevertheless, the author is not aware of literature supporting this hunch, nor does this argumentation explain the subsequent drop in the number of announced joint ventures. A more extensive study of the potential link between the creation of the World Trade Organization and the number of announced joint ventures would be beyond the scope of this PhD-project, but is an interesting area for further empirical research.

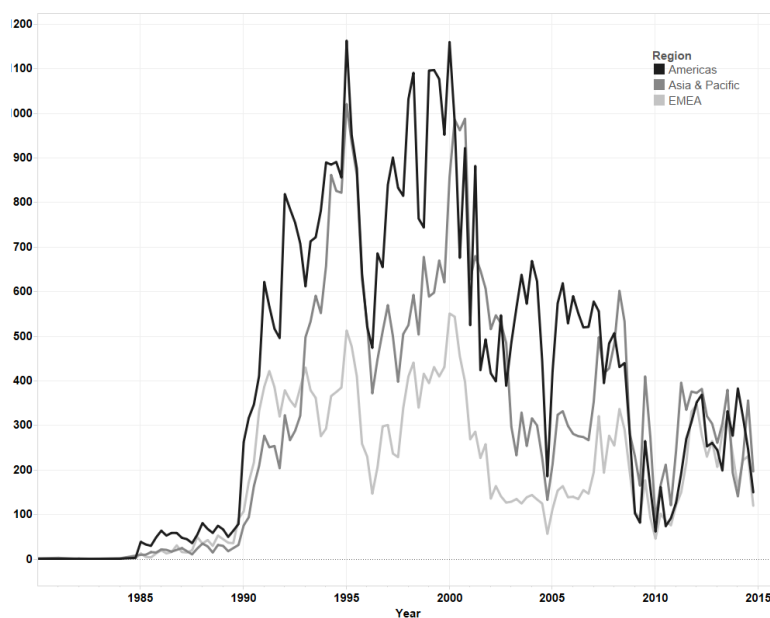


Figure 3.2: Number of quarterly announced joint ventures per region of the alliance

118). Instead, foreign investors could then enter the Chinese market using subsidiaries rather than joint ventures, which had advantages in terms of management and control of intellectual property rights (Agarwal and Wu, 2004, 290; Deng, 2001). In the 2000s the number of quarterly announced joint ventures settled around 1,200 before the financial crisis that followed the Lehman Brothers bankruptcy as well as the European debt crisis caused the number to drop. Lately the number of new joint ventures seems to recover but a final assessment would require data on the years that are to come.²⁵

Figure 3.2 includes the dataset's geographic information on the place of business of the joint venture and hence adds a layer of geographic detail to figure 3.1. It illustrates the number of yearly announced joint ventures from 1964 to 2015, separated by the three regions North and

²⁵Note that at the time of writing of this thesis, not all announced joint ventures of 2015 might have been included in the database. Therefore, the number for 2015 has to be treated with caution.

South America (Americas); Asia and the Pacific region (Asia & Pacific); as well as Europe, Middle East, and Africa (EMEA). The graph shows that all three world regions follow the overall trend and are, therefore, relatively similar in terms of the development of joint ventures. However, the beginning of the 1980s' boom marks the start of a domination by the Americas region that lasts until the beginning of the financial crisis in 2007. This domination is mostly driven by the United States of America that are the host nation for by far the most joint venture alliances (48,521, followed in the ranking by China with 12,522 joint ventures and Japan with 8,100 joint ventures). This lead by the United States is visualized in figure 3.3, that illustrates the number of hosted joint ventures for each country by the size of the circle. As can be seen from figure 3.3, high numbers of joint ventures are also found in India, which comes in fifth with 4,929 joint ventures. India hosts considerably more joint ventures than Brazil, despite Brazil outperforming India in most economic development statistics. Generally, Asian countries show much higher numbers of joint ventures than Latin-American countries (for a more elaborate discussion of joint ventures in emerging economies see Jaideep Anand, 2006).

Figure 3.3, moreover, shows the regional origin of the members of the joint ventures. The fractions of the the circles denote the world region from which the members originate. The amounts are weighted by ownership share, such that all member shares of a given joint venture add up to 1. This weighting is necessary in order to compare joint ventures of different sizes. The first and most important impression that can be obtained from the map is that for all regions the majority ownership of joint ventures lies within the same region. Interestingly, this is also the case for China for which approximately 72% of the joint venture ownership is by the Asia and Pacific region. This number is largely driven by a domestic ownership of 46%, which is not a surprise as it is common practice that the Chinese authorities mainly permit joint ventures in which the foreign investor has at maximum a 49%

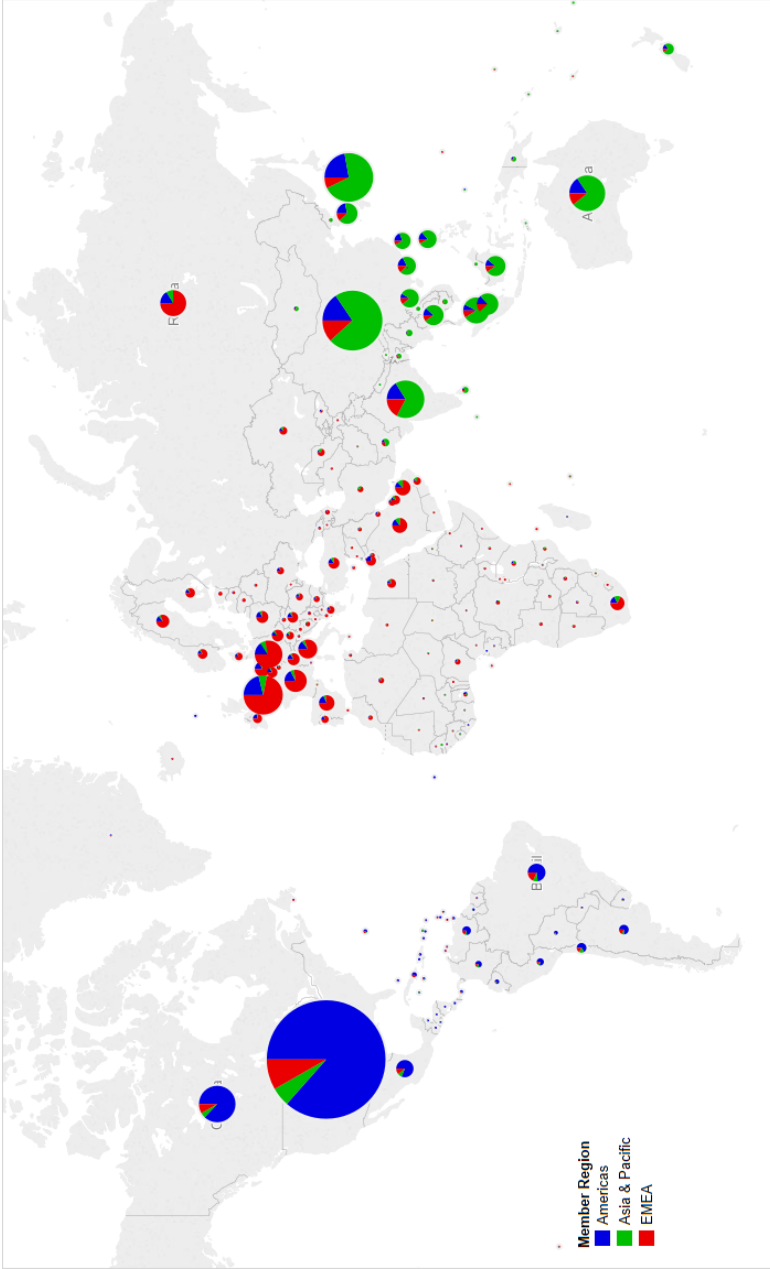
and the Chinese at minimum a 51% share (Salem, 1981, 87).²⁶

Joint ventures are a cooperation of multiple member companies. This number can be as high as 20 members, as is the case, for example, for Advanced Computing Environment, a joint venture that was announced in April 1991 by 20 computer companies to promote a new processor architecture for the computer industry.²⁷ However, in the vast majority of all joint ventures world wide, only two firms are involved. This can be seen from figure 3.4, which provides a histogram of the distribution of joint ventures according to the number of their members. As already mentioned the mode of this distribution is 2, with almost 89% of all joint ventures consisting of two parties. In contrast, joint ventures with 3 members account for only 8.1% of the total and the share sinks further as the number of members increases. While joint ventures with 4 members still account for 1.8%, all joint ventures with 5 or more members add up to only 1.2% of the total number of joint ventures.

When investigating the ownership structure of joint ventures, not only the sheer number of members is of interest, but also the effective allocation of the shares as previously indicated by the example of China (Yan and Luo, 2001, 71-73,77-78). For this purpose figure 3.5 illustrates the distribution of shares in the joint ventures of the dataset. The joint ventures are split into four groups: joint ventures with 2 members (a and e), 3 members (b and f), 4 members (c and g), and 5 or more members (d and h). The graphs in the first row of the figure provide a scatter plot of the minimum and the maximum share for each group. The maximum share is stated on the x-axis (scale from 0% to 100%), while the minimum share is stated on the y-axis (scale from

²⁶For a detailed overview of the ownership of Chinese joint ventures regarding the country of origin, see appendix A.3.

²⁷See e.g. The New York Times, 'New Computer Alliance Forms', John Markoff, April 8, 1991. <http://www.nytimes.com/1991/04/08/business/new-computer-alliance-forms.html> - accessed on March 10, 2016.



Note: This map shows the number of joint ventures according to their seat. The size of the circle indicates the total number of joint ventures in the respective country. The areas in the circle illustrate the regional origin of the joint ventures' members, weighted by their membership share.

Figure 3.3: Origin of joint venture owners

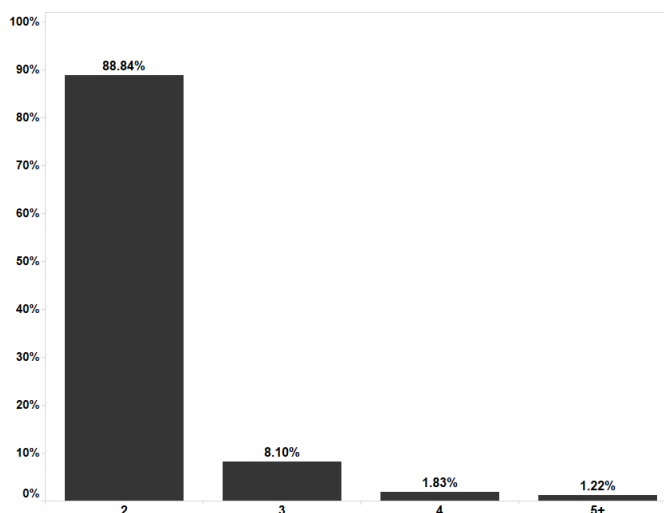
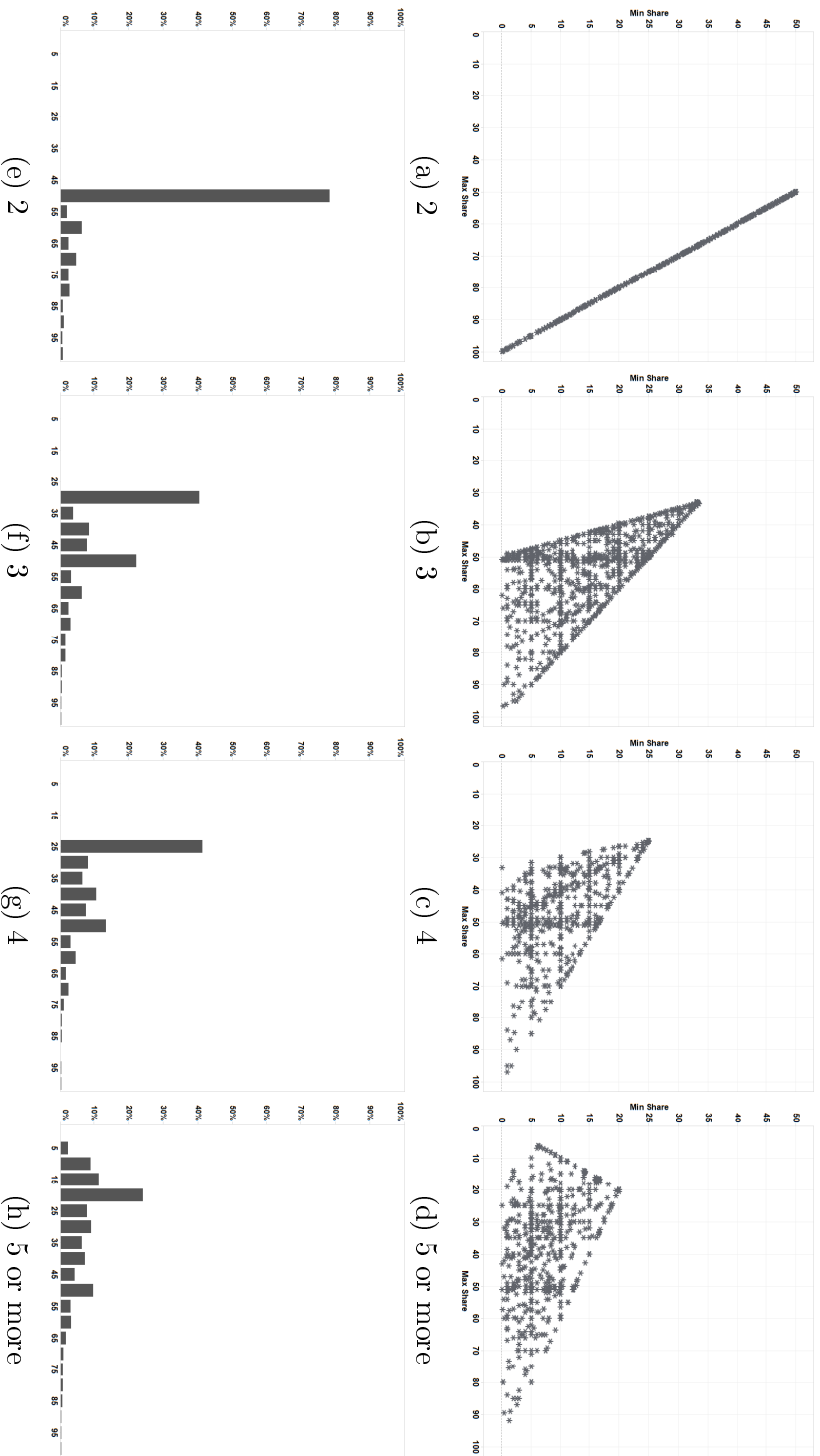


Figure 3.4: Distribution of the number of members of announced joint ventures

0% to 50%). The second row of the figure contains a histogram of the distribution of the maximum share for each of the four groups. The maximum shares are categorized into bins of the size of 5 percentage points.

For the joint ventures with two members sub-figures (a) and (e) show the distribution of the ownership shares. Since in a joint ventures with only two members the sum of the minimum and the maximum share must equal 100, sub-figure (a) unsurprisingly shows a straight line from $\{50; 50\}$ to $\{100, 0\}$. However, sub-figure (e) depicts that the mode of the distribution of the maximum share lies with 78% at 50 percentage points. This means that a vast majority of almost 80% of all two-member joint ventures has a 50 : 50 allocation of membership shares. Moreover, this means, given that two-member joint ventures account for 89% of all joint ventures, that almost 70% of all joint ventures world wide are two-member, 50 : 50 ownership joint ventures.

Sub-figures (b) and (f) depict the ownership structure of joint ventures with three members. Sub-figure (b) shows a triangle with a tip at $\{33; 33\}$. An allocation at point $\{33; 33\}$ means for a three-member



Note: The sub-figures in the top row show scatter plots of the minimum and maximum share (in percentage points) for each group of joint venture member sizes. The depicted triangles represent the space of possible membership allocations (except for two-member joint ventures, where the sum of minimum and maximum must be 100). The histograms in the second row illustrate the distribution of the maximum share for each group. The mode of each distribution is the all-equal share size.

Figure 3.5: Distribution of ownership share by the number of joint venture members

joint venture that all parties have an equal membership share of 33%. From this tip two frontiers span, one to the point $\{50; 0\}$ and another to the point $\{100; 0\}$. The side of the triangle from $\{33; 33\}$ to $\{50; 0\}$ denotes all ownership allocations with two equally large parties (maximum) and one small party (minimum). Conversely, the side from $\{33; 33\}$ to $\{100; 0\}$ marks all ownership allocations with a single large party (maximum) and two equally small parties (minimum). Additionally, a cluster of instances can be seen along the line $\{50; 0\} - \{50; 25\}$. This visual impression is confirmed by sub-figure (f) that shows a bimodal histogram with modes at 33 and 50 percentage points of the maximum share. This bimodal distribution means that, while a majority of 40% of the three-member joint ventures has a equal ownership allocation, the second-most used ownership allocation with 22% is one where a large member holds half of the ownership rights.

The allocation of the minimum and the maximum ownership share for joint ventures with four members is exhibited in (c) and (g). The scatter plot (c) shows a triangle with the tip residing at point $\{25; 25\}$. For a four-member joint venture an allocation where both the minimum and the maximum are at 25% means that all four parties have an equal share of 25% in the joint venture. Two frontiers span from the tip of the triangle to the points $\{100; 0\}$ and $\{33; 0\}$. Similarly as in sub-figure (b), the triangle side from the tip to $\{100; 0\}$ marks all ownership allocations with one large party (maximum) and, here, three equally small parties (minimum). The side from $\{25; 25\}$ to $\{33; 0\}$, conversely, represents all ownership allocations with three equally large parties (maximum) and a single small party (minimum). Additionally, sub-figure (c) reveals two further clusters of membership allocations in two lines. First, a line from the tip to the point $\{50; 0\}$ can be noticed. This line denotes all membership allocations with two equally large parties (maximum) and two equally small parties (minimum). The second line, also visible in sub-figure (b) for the three-member joint ventures, lies along the line $\{50; 0\} - \{50; 16.7\}$, which also for the four-member joint

ventures illustrates the popularity of ownership structures in which one party has a 50% share. Accordingly, the histogram of the maximum share in sub-figure (g) discloses a bimodal distribution, with the two modes laying at 25 and 50 percentage points. The dominating mode with 41% at 25 percentage points, symbolizes an equal allocation of ownership among the four parties. The second mode with 13% at 50 percentage points confirms the popularity of ownership structures where one party holds 50% of the ownership rights.

Joint ventures of five or more members are grouped together and their ownership structure is visualized in sub-figures (d) and (h). Sub figure (d) also shows a triangle for the scatter plot of minimum and maximum shares. The tip of this triangle lies at point $\{20; 20\}$, which reflects an equal allocation of the ownership shares in a five-members joint venture. However, unlike the triangles in (b) and (c), the triangle in (d) is not obtuse but acute. This is because the scatter plot in (d) actually shows not one but multiple, overlaying triangles, one for each of the member-sizes that are grouped together. This overlap produces a left side of the triangle that points to the origin of the plot and hence causes the triangle's shape to be acute. The line that marks the left side connects all tips of the overlapping triangles. Therefore, the side represents every all-equal membership allocations from the five-members $\{20; 20\}$ to the twenty-members $\{5; 5\}$ joint ventures. Similar to the scatter plots (b) and (c), a cluster of allocations along the one-party-50% line $\{50; 0\} - \{50; 12.5\}$ exists.

The corresponding histogram (h) shows the distribution of the maximum share of the group of the five-or-more-members joint ventures. Because of the grouping, the distribution is not truly bimodal, but, nevertheless, reveals similar characteristics as previously observed. The dominating mode lies at 20 percentage points, which represents an equal allocation of ownership shares in a five-member joint venture. Since five-member joint ventures account for a bit more than half of

the joint ventures in the group five-or-more, the location of the dominating mode is also in line with previous findings. Again in line with the previous findings, the second mode lies at 50 percentage points, which confirms the overall observation that the one-party-50% ownership structure is a widely used model.

In conclusion, from this brief empirical analysis the following general points can be drawn on the popularity of joint ventures and their typical membership structure. Joint ventures are widely used as a vehicle for inter-organizational cooperation since the 1980s. More joint ventures are founded when the general economic climate is positive than in times of crisis. Especially, economic crises, such as the one after the Lehman Brothers bankruptcy, negatively affect the overall level of founded joint ventures. The popularity of joint ventures is not specific to a certain region, as all main world regions follow a correlating trend. However, these clusters are the main drivers of this world wide trend: North America, Western Europe, and the Asia & Pacific region. The vast majority of the members originates from the same region as the joint venture itself. With almost 89% of all joint ventures, the two-member joint venture is undisputed the most used form. In terms of membership structure the all-parties-equal ownership structure is the most prominent design. However, the one-party-50% ownership structure seems to be a focal point across all membership sizes. An explanation for this prominence is that a 50%-share combined with an additional vote guarantees a voting majority, which grants a certain decision power (Yan and Luo, 2001, 81-83). However, such decision power prevents not from arising conflicts between the joint venture's parties, neither grants it the success of the party with the majority.

3.2.3 Case Study: Danone versus Wahaha

An illustrative case in which the ownership structure did not prevent a conflict from arising is the Danone versus Wahaha case (Lee and Tan, 2009; Garicano and Rayo, 2016, 9-11; Dickinson, 2007). Danone Group, a French drinks and yoghurt producer, and its partner Wahaha Group Company, a Chinese producer of milk products, formed the Wahaha Joint Venture in February 1996.²⁸ As an experienced multinational, Danone provided resources such as capital and knowledge, as well as access to international markets and jobs. Wahaha provided access to cheap labour, local regulatory knowledge and access to the growing Chinese market.²⁹ The joint venture was initially very successful, with Wahaha's products becoming a leading brand in the market and the joint venture accounting for more than 5 per cent of Danone's profits in 2006.³⁰

A conflict between the two cooperating parties arose in 2007, when Danone publicly accused Wahaha of illegally producing and selling Wahaha-branded products outside the joint venture. The Wahaha Group and its chairmen Mr. Zong created a series of non-joint venture companies that competed directly with the joint venture, selling the same products and using the Wahaha trademark.³¹ According to Danone, the parallel operation was of such a scale that it made similar profits to the joint venture itself. Wahaha Group's chairman, Mr. Zong, conversely accused Danone of trying to take control of Wahaha

²⁸Bloomberg News, 'Danone Forms Milk Venture With Hangzhou Wahaha in China', April 2, 1996. Bloomberg Identifier: NSN DP81W11A1I5C.

²⁹The Economist, 'Wahaha-haha!', April 19, 2007. <http://www.economist.com/node/9040416> - accessed on May 24, 2016.

³⁰Financial Times, 'How Danone's China venture turned sour', Geoff Dyer, April 11, 2007. <http://www.ft.com/cms/s/0/89a31958-e855-11db-b2c3-000b5df10621.html#axzz3ltqN0Rz2> - accessed on May 24, 2016.

³¹Bloomberg News, 'Danone Accuses Wahaha of Breaching China Partnership', April 10, 2007. Bloomberg Identifier: NSN JGALXG1A1I4I.

subsidiaries that were not part of the joint venture.³²

Legally, Danone had the upper hand as it owned 51% of the joint venture. The way that this had come to be, however, already indicates a source for conflict in the joint venture. At the start of the Wahaha joint venture, three participants were involved, with Wahaha Group owning 49% of the joint venture and Danone and the third party, Baifu, each owning 25.5%. From this point of view, Wahaha Group was the majority shareholder in the joint venture and felt it controlled the joint venture. When Wahaha Group transferred its trademark to the joint venture, it therefore did not feel concerned. However, in 1998 Danone gained a 51% ownership by buying out the interest of Baifu, giving Danone complete legal control over the joint venture as well as Wahaha's trademark. While this result was implied by the structure of the joint venture from the beginning, it is clear from the public statements that Wahaha Group did not anticipate it, leading to resentment on the part of Wahaha Group and Mr. Zong (Dickinson, 2007).

At this point it also became clear that the 51% ownership of Danone was not going to preclude a conflict between the partners, for two main reasons. First, although Danone had a majority ownership, in China employees in private enterprises often feel a stronger loyalty to their manager than to the organization itself. Danone had not been involved in the daily operations of the company, meaning that the joint venture depended on Mr. Zong's continuing co-operation as chairman, general manager and "driving force" behind the joint venture.³³ Secondly, Wahaha had not actually transferred the trademark to the joint venture, because the Chinese Trademark Office had rejected the request

³²Bloomberg News, 'Danone Accused by Wahaha of Breaking Contract, Echos Says', April 17, 2007. Bloomberg Identifier: NSN JGMQHA1A74E9.

³³Financial Times, 'How Danone's China venture turned sour', Geoff Dyer, April 11 2007. <http://www.ft.com/cms/s/0/89a31958-e855-11db-b2c3-000b5df10621.html#axzz31tqN0Rz2> - accessed on May 24, 2016.

to do so. Instead, the parties registered a license agreement with the Trademark Office, which was not a full license agreement but only an abbreviated one, because of concerns that the Trademark Office would otherwise not accept it. This meant, essentially, that Wahaha Group never met its obligation of capitalisation of the joint venture (Dickinson, 2007). It can thus be said that Wahaha Group, in various ways, held assets that were crucial to the continuation of the joint venture (Garicano and Rayo, 2016, 9-11).

In 2007 Danone started arbitration proceedings in Stockholm on the basis that the non-joint venture companies violated both the trademark license and the joint venture agreement.³⁴ Shortly after Wahaha Group applied for arbitration as well, before the Hangzhou Arbitration Commission.³⁵ Wahaha Group sought to have both trademark license agreements declared void. The basis for this claim was that the license would be illegal at the time it was granted because it was intended to avoid the requirements of Chinese law (Dickinson, 2007; Garicano and Rayo, 2016, 9-11). Wahaha won the trademark arbitration at the Hangzhou Arbitration Commission, which accepted Wahaha's request that the trademark transfer agreement be terminated.³⁶ This ruling was upheld on appeal in 2008.³⁷ In late 2009, the Stockholm arbitration resulted in a cash settlement leaving the trademark with Wahaha in exchange for a 300 million Euro cash transfer.³⁸

³⁴Bloomberg News, 'Wahaha Says It "Could" Sue Danone for 5 Billion Euros', June 26, 2007. Bloomberg Identifier: NSN JK94QN0UQVI9.

³⁵Bloomberg News, 'Wahaha's Arbitration Claim Against Danone Accepted in China', June 18, 2007. Bloomberg Identifier: NSN JJTOEL1A1I4H.

³⁶Bloomberg News, 'Wahaha Wins Suit Against Danone Director on Unfair Competition', December 9, 2007. Bloomberg Identifier: NSN JSTFZT1A74EA.

³⁷Bloomberg News, 'China Court Rejects Danone Appeal Application in Wahaha Dispute', August 5, 2008. Bloomberg Identifier: NSN K5436F0UQVIA.

³⁸Bloomberg News, 'Danone Wins Ruling Against Wahaha Over Now-Broken Partnership', November 9, 2009. Bloomberg Identifier: NSN KSUNLP1A1I4J; Bloomberg News, 'Danone to Sell Wahaha Stake for 300 Million Euros, Caijing Says', September 30, 2009. Bloomberg Identifier: NSN KQRVIQ6LUTXS.

3.2.4 Arbitrated Joint Venture disputes

Because of the private nature of arbitration, the results of joint venture disputes that were solved by commercial arbitration are usually not published. This situation makes it nearly impossible to provide a comprehensive empirical overview of arbitrated joint venture disputes. Nevertheless, certain cases with specific relevance for the development of arbitration case law are published anonymously.

This section makes use of this practice by taking four of these anonymously published cases as examples to illustrate typical disputes in an international joint venture. Leaving aside the legal specifics, the presentation of these example cases concentrates on their facts because the idea is rather to provide an abstracted impression of the nature of these disputes than a profound legal analysis.

In order to present the nature of these example disputes, the claimant and the responded are mentioned. Secondly, the purpose of the joint venture and its ownership structure are briefly introduced. Thirdly, the dispute between the joint venture's parties is sketched. These disputes fall into two broad categories: On the one hand conflicts about the distribution of the surplus (profit or other benefits) that the joint venture had produced and on the other hand disagreement about the contributions a party made to the joint venture. Each example concludes with the arbitrator's decision and his characteristics as third party decision maker. These characteristics will then serve in a stylized manner as basis for a formal analysis in the following chapter.

Mother company of joint venture corporation shareholder (US) v. venture corporation shareholder (Mexico)

In the 2013 case *Mother company of joint venture corporation shareholder (US) v. venture corporation shareholder (Mexico)*, which was

arbitrated under French jurisdiction by the International Court of Arbitration of the International Chamber of Commerce in San Diego (United States), the main cause of dispute was disagreement over the distribution of the profit of the joint venture.³⁹ The claimant (C), a US company, and the respondent (R), a Mexican venture corporation, engaged into a joint venture for the operation of C's warehouse stores in Northwest Mexico. 50% of the ownership shares of the joint venture were allocated to C whereas the other 50% were allocated to R.

The profits were almost entirely reinvested and hence the joint venture produced an accumulated, single surplus until the moment at which the dispute arose. This occurred 15 years after the joint venture was founded because R desired the distribution of the accumulated profit. In order to do so, it took two actions: First, it removed the director of operations, a former employee of C. Second, it called for a shareholder meeting to "decide on the distribution of dividends"⁴⁰. This meeting ended in a deadlock between C and R and triggered further negotiations about the distribution of the joint venture's surplus.

In the course of these negotiations regarding the profits distribution, R filed a case at a local court attempting to force a distribution of the surplus. Through the court decision, R acquired the payment of its dividends, according to Mexican company law. In response C started the arbitration proceedings against R, arguing that R violated the contractual mechanisms for resolving a deadlock. The arbitrator followed the argumentation of C and ordered R to repay the dividends to restore the joint venture's financial status. With this award the arbitrator enforced the surplus sharing rule that the parties agreed on at the foundation of the joint venture.

³⁹Mother company of joint venture corporation shareholder (US) v. venture corporation shareholder (Mexico), Final Award, ICC Case No. 15248 in Albert Jan van den Berg (ed), *Yearbook Commercial Arbitration 2013 - Volume XXXVIII*, *Yearbook Commercial Arbitration*, Volume 38, Kluwer Law International, pp. 127 - 173.

⁴⁰*Ibid.* p. 127.

Limited Liability Company (Bahrain) v. Establishment (Saudi Arabia)

In the 2006 case *Limited Liability Company (Bahrain) v. Establishment (Saudi Arabia)*, which was arbitrated under Bahrain jurisdiction by the Gulf Cooperation Council Commercial Arbitration Center in Manama (Bahrain), a main cause of dispute was the respondent's failure to provide balance sheets for the joint venture and the resulting ambiguity about its financial state.⁴¹ The claimant (C), a limited liability company from Bahrain, and the respondent (R), the owner of a Saudi Arabian Establishment, engaged into a joint venture for the operation of R's establishment. 83.33% of the ownership shares of the joint venture were allocated to C whereas the other 16.67% were allocated to R. Additionally, R held 16.67% of C's shares. Because of its majority position C was appointed as the manager of the joint venture, but the de facto management was with R.

In 2002 R violated its obligation to report the joint venture's financial situation in terms of the provision of balance sheets. C, subsequently, alleged that R attempted to embezzle the joint venture's surplus and hence invoked arbitration proceedings. The arbitration court applied expert knowledge in order to survey the financial and contractual situation of the joint venture to verify the allegations. Because of the extensive assignment of the expert, the time limit of concluding the arbitration was extended by the GCC Commercial Arbitration Center. As a result of the expert's investigations, the arbitrator awarded C SAR 17,746,462 from R. By applying the expert's knowledge, the arbitrator verified the joint venture's surplus and enforced its intended sharing.

⁴¹Limited Liability Company (Bahrain) v. Establishment (Saudi Arabia), Final Award, GCC Case No. 19XS/26/10/2006 in Albert Jan van den Berg (ed), Yearbook Commercial Arbitration 2013 - Volume XXXVIII, Yearbook Commercial Arbitration, Volume 38, Kluwer Law International 2013, pp. 63 - 79.

Construction Company v Construction Company

In the 1996 case *Construction Company v Construction Company*, which was arbitrated under Swiss jurisdiction by the International Court of Arbitration of the International Chamber of Commerce in Geneva (Switzerland), the dispute concerned disagreement over the beneficiary of two Export Incentive Certificates issued by the Turkish state.⁴² The claimant (C), a US construction company, and the respondent (R), a Turkish construction company, entered into a joint venture for a construction project for a Turkish authority. 50% of the ownership shares of the joint venture were allocated to C whereas the other 50% were allocated to R. R was appointed as manager of the joint venture company.

Before and shortly after the foundation of the joint venture, R got issued two Export Incentive Certificates (EIC) by the Turkish state. These EICs granted the holder benefits that were in relation with the activities of the joint venture and therefore accounted to its surplus. Six years after the establishment of the joint venture R sought payment of the share of the surplus concerning the EICs' benefits. Because of the ownership structure, no decision regarding the sharing was reached in the board of the joint venture. As a result, R issued a "leadership decision"⁴³ that granted itself the whole share of the surplus that was generated by the EICs' benefits. Hereupon, C called for arbitration, claiming that it was agreed in the joint venture agreement that the benefits of the EICs are to be enjoyed by the joint venture. R replied that Turkish law prohibits benefits derived from EICs to be shared with foreign entities.

In his decision the arbitrator differentiated between tax benefits and

⁴²Construction Company v Construction Company, Final Award, ICC Case No. 8528, 1996 in Albert Jan van den Berg (ed), *Yearbook Commercial Arbitration 2000 - Volume XXV*, Yearbook Commercial Arbitration, Volume 25, Kluwer Law International, pp. 341 - 354.

⁴³Ibid. p. 341.

savings derived from EICs. The EICs' tax benefits are governed by Turkish law. As a consequence they are non-transferable privileges, to which R is solely entitled to. The tax savings, on the contrary, are governed by private contractual agreement between C and R. Therefore, the stipulations in the joint venture agreement apply and hence the joint venture is entitled to these benefits. By applying his expert knowledge in legal, contractual and financial aspects, the arbitrator defined and delimited the joint venture's surplus and enforced the contracted sharing rule.

First Investor, in liquidation (EU country), Second Investor (EU country) v Ministry of Agriculture (Non-EU country)

In the case *First Investor, in liquidation (EU country), Second Investor (EU country) v Ministry of Agriculture (Non-EU country)*, which was arbitrated by the International Court of Arbitration of the International Chamber of Commerce in Geneva (Switzerland), the dispute concerned a failure by the respondent to contribute adequately to the joint venture.⁴⁴ The claimant (C), two investors from European Union countries, and the respondent (R), the Ministry of Agriculture of a Non-EU country, entered into a joint venture for the cultivation of agricultural products and breeding of livestock, as well as their sales and distribution. The joint venture agreement stipulated that C contributes with funding and that R contributes with land, workforce, equipment and facilities. Moreover, it was agreed that the joint venture would stop operations if it would be not profitable for a five years period (cease agreement).

⁴⁴First Investor, in liquidation (EU country), Second Investor (EU country) v Ministry of Agriculture (Non-EU country), Final Award, ICC Case No. 12112 in Albert Jan van den Berg (ed), *Yearbook Commercial Arbitration 2009 - Volume XXXIV*, *Yearbook Commercial Arbitration*, Volume 34, Kluwer Law International, pp. 77 - 110.

From the beginning the joint venture had difficulties starting operations mainly because the land was only partially cultivated due to property conflicts with sedentary farmers, a lack of available workforce, protests and not sufficient office space. The parties negotiated to remedy the problems and adapted their agreement respectively. Nevertheless, the joint venture was producing losses over the first years. In the course of an outbreak of a conflict in a neighboring country, R inquired C if part of the joint venture's land could be used by an international organization to host refugees. C agreed to this request that the international organization may use "a part" ⁴⁵. Thereupon, R made the whole land available for the international organization. Because accommodation facilities were established on the land by cementing the surface, a vast effort would be required to restore the land for agricultural production.

As a result, C rejected further financial contributions to the joint venture and demanded its liquidation according to the initial cease agreement by invoking arbitration proceedings. After determining his jurisdiction, the arbitrator examined the claim that R had failed to fulfill its contribution obligations. As a result of his verification of the contributions to the joint venture, the arbitrator determined that R had failed its contribution duty. Therefore, the arbitrator ordered the dissolution of the joint venture and awarded C damages to the amount of its financial contributions. In his role as third party decision maker, the arbitrator verified the parties' contributions and concluded this in the final award.

Bermudian Company v Spanish Company

In the case the Bermudian company v. Spanish company that was negotiated under French jurisdiction in Paris in the year 1987 the dispute

⁴⁵Ibid. p. 77.

between the parties concerned the distribution of profits of a joint venture between the parties.⁴⁶ The joint venture was established in Spain in the year 1972 for the purpose of the construction and operation of petrochemical products for the Spanish market. Each party the claimant (C), a Bermudian company, as well as the respondent (R), a Spanish company, were in passion of 50% of the ownership rights to the joint venture. While the joint venture contract (*Basic Agreement*) stated that each party could veto the expansion of the business beyond the production and the sale of petrochemicals and the investment in additional facilities, the distribution of the joint venture's profits was not subject to any veto rights. It was stipulated in the contract that the maximum dividend that maintains the mandatory legal reserves would be paid to the two owners each year unless the annual shareholders meeting would decide differently.

The dispute arose during the annual shareholders meeting in 1985. During the meeting the annual report, the balance sheet, and the profit-and-loss statement were unanimously approved. Subsequently, C put the distribution of the year profit of approximately 359 million pesetas to vote. R rejected this with the argument that the profit should be kept within the joint venture as a reserve for the expansion of its production capacity. This expansion was suggested by R at a board meeting, preceding the annual shareholders meeting. However, at the same meeting C refused the expansion plan by executing his aforementioned veto right.

Based on his refusal of R's expansion plans, C declared that based on the joint venture contract R is obligated to approve the distribution of the profits. When R at a subsequent shareholders meeting, approximately two month later, again rejected to confirm the distribution

⁴⁶Bermudian Company v Spanish Company, Final Award, ICC Case No. 5485, 18 August 1987 in Albert Jan van den Berg (ed), Yearbook Commercial Arbitration 1989 - Volume XIV, Yearbook Commercial Arbitration, Volume 14, Kluwer Law International, pp. 156 - 173.

of the profits, C filed for arbitration at the International Chamber of Commerce. C amended his request in the following year to also include this distribution of the profits for the fiscal year 1986 in the arbitration proceedings. R challenged the proceedings with the argument that the arbitral tribunal has no jurisdiction as the arbitral agreement was null and void under Spanish law. After determining its jurisdiction, the arbitration tribunal concluded that R failed to fulfill its contractual obligations and, accordingly, awarded C 50% of the maximal payable profits for the fiscal year 1984 and 1985 plus relevant interests.

3.3 Hard and soft governance mechanisms

The disputes presented in the previous section illustrate the need of meta-organizations for adequate governance. However, meta-organizations often cannot seize on governance mechanisms that were established for employment based organizations because, as already noted in chapter 2, meta-organizations are different from employment based organizations with respect to their structure and internal organization. The absence of a hierarchical structure in meta-organizations means that there is no central authority to give directions and to solve disputes. Moreover, a peer-monitoring of the members is necessary as the members' tasks cannot be determined hierarchically. This means that meta-organizations require specific governance mechanisms for these particular functions.

These specific mechanisms for the governance of meta-organizations can take different forms. Krebs and Jung (2015) derive a definition in the context of business networks that distinguishes hard and soft governance mechanisms. Their definition follows the notation of hard and soft law to differentiate binding legal instruments from quasi-legal instruments without any legally binding power. Translated to governance, this distinction means that hard governance mechanisms are

legally binding and hence can be enforced, while soft governance mechanisms are not legally binding and only rely on self-enforcement.

In meta-organizations hard governance concerns mechanisms to take decisions, which can be enforced in ordinary courts. For this enforceability the mechanisms have to be stipulated in the meta-organization's founding agreement and must be in accordance with the relevant company and contract law. For employment based organizations a directive by the board could be seen as such a hard governance mechanism. The board's authority to give directions to its employees is established by the employment contracts and is enforceable in court. If an employee refuses to follow working directions, a labor court cannot force the employee to perform a certain task, but can allow the employer to terminate the contract. This way, the court provides a legal remedy in case the hard governance mechanism is not honored.

Soft governance mechanisms, on the contrary, are practices in meta-organizations that contribute to the organization's governance but which are not enforceable in court. These mechanisms may be, but are not necessarily, explicitly stipulated in the meta-organization's founding agreement. Nevertheless, the design of the meta-organization needs to facilitate the effective functioning of the mechanism. In the context of employment based organizations, such a soft governance mechanism could be the system of promotion. The possibility of a promotion as a benefit for good performance motivates the employees to work hard. While this system provides governance in favor of the organizational goals, it is not stipulated in the employment contract. Accordingly, it is not possible to sue for the lack of promotion in a laborcourt.⁴⁷ Nevertheless, the design of the organization has to incorporate career paths such that promoting an employee is possible.

Because both hard as well as soft governance mechanisms are very

⁴⁷Except in case of discriminatory practices, which is not the type of situation that is referred to here.

important for the governance of meta-organizations, one example of each will be studied in detail in the following two chapters. Chapter 4 concerns decision making by third parties, such as arbitration, as a hard governance mechanism for meta-organizations. Subsequently, chapter 5 discusses a soft governance mechanism in the form of peer monitoring and partner selection for research joint ventures.

4 | Conflict Resolution in Meta-Organizations⁴⁸

4.1 Third Party Decision Making in Meta-Organizations

In recent years, the collaboration of legally independent entities for the production or commercialization of innovative products has become increasingly important (Oxley, 2013, 3). These meta-organizations are often found in an international context, such as for the market entry in China, or for the development of high technology, as for instance the recent partnership of IBM and Twitter for big-data intelligence.⁴⁹ The motivation of these interorganizational collaborations is to cooperate in exploration and exploitation (Oxley and Silverman, 2008; Parmigiani and Rivera-Santos, 2011; Gulati et al., 2012; Gulati, 1998; Argyres and Mayer, 2007). Because of its composition of legally independent firms, the meta-organization misses the level of formal authority that an organization build upon employment relationships would provide

⁴⁸This sections is based on the paper *Conflict Resolution in Meta-Organizations: Internal or External Governance*, which is joint work with Klaus Heine.

⁴⁹See: IBM, 'Twitter and IBM Form Global Partnership to Transform Enterprise Decisions', October 29, 2014. <http://www-03.ibm.com/press/us/en/pressrelease/45265.wss> - accessed on August 11, 2015.

(Gulati et al., 2012, 573). In the absence of formal authority the design of the meta-organization has to provide mechanisms to resolve disputes between the business partners (Lumineau et al., 2015; Ahrne and Brunsson, 2005; Macneil, 1978). An eligible form for this conflict resolution is third party decision making, such as commercial arbitration, which means that the dispute is decided by a supposedly external party. But the use of third party decision making in the design of a meta-organization raises two questions: Primarily, what are the relevant attributes that a third party has to embody to be appropriate? But more generally in the sense of Santos and Eisenhardt (2005), should the third party not be considered part of the meta-organization in contrast to the external position that its name suggests?

Since these inter-firm collaborations usually involve complex interactions that are not fully verifiable, they, contrariwise, cannot be solely governed by contractual agreements (Gibbons, 2005; Chi, 1996). For this reason, alternative governance structures such as in form of a meta-organization are necessary (Ménard, 2004, 2013; Baker et al., 2008). However, a key aspect in their design is how to accommodate the absence of formal authority. This power gap can be filled by a third party that is assigned an *arbitrary* decision right to solve disputes within the meta-organization (c.f. Schanze, 1993). An example for such an incorporation of third party decision making in the design of meta-organizations are joint venture agreements that contain an arbitration clause (Casella, 1996; Lumineau and Oxley, 2012).

The advantages of commercial arbitration compared to decisions of ordinary courts can be summarized in four points. *Neutrality*: partners in an international joint venture prefer a jurisdiction for their disputes that is not linked to the home country of one of the partners, since that would imply the risk that the local legal system is not fully understood or that the ordinary court is biased against foreign companies. *Privacy*: it is easier to maintain trust and continue business after the conflict

resolution if the nature of the dispute is not publicly discussed (Fulmer and Gelfand, 2012). *Expertise of the tribunal*: an arbitration court is formed by experts from the field in order to resolve the conflict. *Final and enforceable decisions*: arbitration usually does not foresee appeal, giving the parties a clear prospect for their future cooperation and plans. Because of the New York Convention of 1958 – which has been signed by more than 140 countries – the enforcement of the decision award is easier than that of a domestic court’s ruling (Mentschikoff, 1961).

Because of his private nature, a third party decision maker, in contrast to an ordinary court, is not bound by strict procedural rules and hence has the necessary latitude to base the decision only on his conviction (Born, 2009, 1739-1765). Moreover, due to the aforementioned characteristics of privacy and expertise, third party decision makers have better access to the internal information flow of joint ventures than ordinary courts. Translating these two advantages of third party decision making into the hold-up view of inter-firm collaboration can lead to a better formal understanding of the balancing of (bargaining) power in meta-organizations. Moreover, it allows to identify relevant attributes for a third party to be eligible for decision making in a meta-organization.

Based on this formal view of third party decision making in meta-organizations, an answer to the question of positioning the third party decision maker can be discussed. The term *third party* suggests that the decision maker is external and hence not part of the meta-organization. In this view the third party, a commercial arbitrator for example, is seen as a contractual enforcement mechanism that can be both substitute as well as complement to ordinary courts (Katz, 2008). Considering third party decision making also as a complement to ordinary courts improves our conceptual understanding of inter-organizational dispute resolution. But narrowing its function only to contractual enforcement

and hence ignoring its functional role might hamper our understanding of the specific corporate governance system of meta-organizations (c.f. Aguilera et al., 2015).

While traditionally the literature differentiates between internal and external corporate governance (Aguilera et al., 2015; Walsh and Seward, 1990), this dichotomy might not be appropriate for meta-organizations. Given their nature as a hybrid between hierarchy and market, meta-organizations are necessitated to employ market based governance mechanisms for critical functions inside the organization. The reward distribution, for instance, is a key function of the organizational design, that has to be addressed by *new forms of organizations* (Puranam et al., 2014). Since third party decision making can be of high importance for the distribution of a meta-organization's rewards, it can be understood as internal part of the organizational structure. This conceptual placement within the boundaries of the firm provides a new perspective to the relation between meta-organizations and third party decision making. By taking this rather organizational perspective, the focus of analysis shifts from mainly contractual and legal questions to questions of organizational design. Therefore, including the role of third party decision making into the design analysis contributes not only to our understanding of this organizational governance mechanism, but it also sheds light on means to balance bargaining powers within meta-organizations and on the corresponding reward distribution.

4.2 Meta-organizations, Conflict and the Theory of the Firm

Meta-organizations consist of legally independent organizational entities (Gulati et al., 2012; Parmigiani and Rivera-Santos, 2011). This distinguishes meta-organizations from employment-based organizations

which are hierarchically composed of individual agents, mostly employees. Employment-based organizations emerge as a hierarchy of individuals and build upon employment relationships, which formally define power and authority. Because meta-organizations have not the employment relationship at center stage but complex corporate contracts, they miss to a large degree the typical hierarchical organization of power, and as a consequence they are either characterized by the absence of formal authority at all or formal authority plays out through complex contractual networks.

In the absence of formal authority, the individual interests of each member can impair or even block the decision making process in the meta-organization (Lumineau et al., 2015; Ahrne and Brunsson, 2005). Conflict areas such as the coordination of efforts or the distribution of benefits can potentially deadlock the whole decision making process (Macneil, 1978, 875-880). To prevent that infighting between the members deadlocks the meta-organization, a sophisticated governance mechanism is required that is able to resolve internal disputes by means of external enforcement (Lumineau and Oxley, 2012).

To address the specific governance requirements the design of meta-organizations can provide a third party decision maker, who is equipped with the necessary power to resolve internal disputes. In case a dispute arises between the members of the meta-organization, the third party decision maker is called for resolution. Thereby it can be assumed that a private dispute resolution mechanism has multiple advantages over calling for a decision from a public court. In particular, a third party decision maker is not bound by national laws, which may provide strict procedural rules or limits the jurisdiction of ordinary courts (see Benson, 1999; Craig et al., 1990). In addition, a private third party has typically more expert knowledge and hence is better able to observe the entities' effort levels. This is because, private third party decision makers are not only legal professionals but often also experts

in the respective industry of their assignment. These industry experts hold business and technical knowledge that helps to better understand the circumstances of the dispute and to timely provide an adequate resolution. Moreover, the high confidentiality of alternative dispute resolution increases the parties' willingness to share sensitive business information, which improves the third party's access to relevant information (see Stipanowich, 2004, 846). Finally, confidentiality allows the involved parties to maintain the meta-organization's external image and reputation, which might be negatively affected by a revelation of the internal dispute (for a discussion see Noussia, 2010).

Highlighting these advantages of private third party decision making for internal dispute resolution in meta-organizations, raises the question if this governance mechanism should be considered as external as the term *third party* suggests, or whether it is rather internal. All the mentioned attributes, access to the internal information, authority for decision making, and privacy, are very similar to the features of internal governance mechanisms such as the board of directors in a regular company. Moreover, decision awards of the private third party ultimately rely also on enforcement by ordinary courts, such as any other internal governance mechanism has to be backed by the external public governance system (Aguilera et al., 2015). To substantiate this conceptual placement of third party decision making within the boundaries of meta-organizations, it seems beneficial to test it against the firm boundary concepts of incumbent theories of the firm.

Understanding inter-firm collaboration as a meta-organization is not the first attempt to elaborate on the determination of the boundaries of the firm. Williamson (1991) uses the term hybrid organization to discuss this distinct type of governance structure that lies between market and hierarchy. His starting point is that organizations have to adapt to changing situational contexts, in order to survive, and that organizational types vary in their capacity to adapt accordingly. He

distinguishes between two types of adaptation, autonomous and cooperative, which mirror in the two generic governance structures of market and hierarchy. In particular, in the governance mode 'market' autonomous adaptation works best to address changes, whereas in 'hierarchy' cooperative adaptation is most efficient. The hybrid organization, as a combination of market and hierarchical features, has the advantage of being reasonably suitable to tackle both types of adaptations. As a result the concrete situational context determines, which governance mode is the most suitable to keep an organization viable.

Transaction cost economics is another important approach towards a theory of the firm. This approach mainly concerns the question whether a transaction is more efficiently conducted in the market or inside an organization (Coase, 1937; Williamson, 1975, 1985; with a critical appraisal of Coase's approach see Alchian and Demsetz, 1972). Therefore, transaction cost economics concludes that firms occur when market transactions are too costly. However, given the hybrid nature of meta-organizations as an intermediate between market and integration, the transaction cost lens promises only very limited information on the role of third party decision making as internal governance device. Moreover, the transaction cost perspective is relatively imprecise with regard to the allocation of power and authority within the firm (Hart, 2011; Rajan and Zingales, 1998).

From a legal point of view the power in an organization bases on the *in rem* rights of property. This means that the answer to the question of authority in a meta-organization lies in the allocation of asset ownership of involved parties (Baker et al., 2002). The importance of the allocation of assets in a firm was stressed in the property rights approach by Grossman-Hart-Moore (Grossman and Hart, 1986; Hart and Moore, 1990), which emphasizes the importance of the residual right of control that ultimately gives the power to govern the interactions of production.

The New Property Rights theory is especially elaborative on the implications of the two polar transaction structures market and integration. In a system of integrated ownership the owner can selectively replace certain workers and assets from the production process whereas in a market transaction only the counterparty as a whole can be replaced, thus in the latter case the decision is only digital. Following this, the boundaries of the firm are defined by the integrated ownership of productive assets which are controlled by a single entity. Applying this boundary criteria to meta-organizations would draw the firms' boundaries around the individual entities and qualify the transactions within the meta-organization as market transactions. Accordingly, dispute resolution by third party decision making would have to be considered as external governance which is a sheer substitute to ordinary courts. This consideration reveals that the very stringent classification by ownership is not very appropriate to investigate the boundaries of meta-organizations. Since the New Property Rights theory focuses exclusively on the power vested in property rights, it cannot accommodate meta-organizations which are characterized by the absence of formal authority and the non-integration of property rights.

The boundary problem is further seized by Zingales (2000), who describes from a corporate finance point of view the development of the theory of the firm. He argues that the incumbent theories of the firm are certainly a necessary foundation for a principal understanding of firm organization. However, over the years the traditional approaches towards a theory of the firm have lost their predominance as the standard role model for the more complex (meta) organizational structures, as hybrids, which are widely emerging. In the modern distributed economy the boundaries of the firm have become fuzzy and "the major corporate governance problem has become how to prevent conflicts among stakeholders from paralyzing or destroying the firm." (Zingales, 2000, 1648) Therefore, a sensible balance between the different actors in an organization and especially between their *de jure* and *de facto* control

power is crucial (see also Rajan and Zingales, 2000a,b). This function of balancing the diverging powers in a meta-organization could be fulfilled by third party decision making.

Taking an holistic perspective, Santos and Eisenhardt (2005) derive four concepts of the boundaries of the firm that build upon traditional theories such as transaction cost economics, the new property rights theory, the resource-based view, and the knowledge-based view. The first concept, *efficiency*, sets the boundary where a certain transaction can be carried out more efficiently, in the market or inside the organization. This boundary is materialized by the combination and separation of property rights in order to reach the efficiency frontier. *Power*, as the second concept, places the boundary at the point at which the organization's area of influence ends. It, therefore, understands an organization as a means to exert control over crucial factors and hence sets the boundary where this sphere of power ends. The third conception, *competence*, refers to the question which resources should be held by the organization. Accordingly, the boundary is defined by the resources that are instrumental to the organization's objective. The fourth boundary concept of Santos and Eisenhardt is identity, which refers to the members' definition of the organization's attributes and purpose. This self-definition implies that the boundary is set by the shared values, norms, and intentions of the organization members.

For the analysis if third party decision making is an internal or external governance mechanism, efficiency and identity appear not suitable because these concepts are too stringent in defining boundaries. Since efficiency focuses on the consolidation of property rights it is unable to identify boundaries of meta-organizations, which are characterized by distributed ownership in form of separate legal entities. Identity focuses on the individual members and their identification with the organization, which is not applicable for meta-organizations that consist of other organizations and not of individuals. Conversely, power

and competence seem to be good candidates to discuss the boundaries of meta-organizations because they regard the essential functions of dispute resolution, namely the resources and authority to resolve the conflict. However, to further discuss the placement of third party decision making on the basis of these two boundary conceptions, it is necessary to conceptualize our understanding of alternative dispute resolution and to clearly distinguish its role in meta-organizations from ordinary courts. For this conceptualization the following section makes use of a formal model that allows to identify relevant characteristics for third party decision makers as internal conflict resolution mechanism in meta-organizations.

4.3 A Formal View on Third Party Decision Making in Meta-Organizations

Because of the absence of formal authority in a meta-organization, infighting between the members over the profits might arise. This conflict potential is likely to be anticipated by the members, with the result that they may withhold critical resources or more generally devote less effort to the meta-organization. Because of these lower efforts, the meta-organization underperforms and the members miss out on potential profits. To attain these profits the design of the meta-organization can include a governance mechanism to internally solve conflicts between the members. For this internal dispute resolution the design can stipulate a third party decision maker that has the power to form a decision to settle the conflict.

This dispute resolution requires two attributes to be feasible. Firstly, the third party decision maker must have external authority, comparable to the board of directors of a classical organization. This external authority enables the third party's decision to rely on external governance mechanisms, such as ordinary courts, which in turn gives him

the power to resolve internal disputes. An arbitration court, as an example, issues an award that is enforceable in ordinary court and hence fulfills this criteria. Secondly, the third party decision maker must be able to observe internal information of the meta-organization, such as the members' effort levels. If this is not the case, the third party has not the necessary information to reach an appropriate decision. If these two characteristics are met by the third party decision maker, then he is able to resolve conflicts within the meta-organization by issuing a binding decision award.

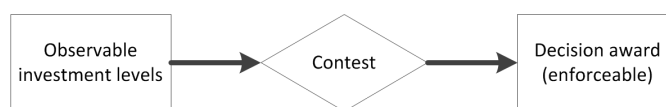


Figure 4.1: Process of dispute resolution by third party decision making

To illustrate the role of the third party in balancing the bargaining power of the individual parties in the meta-organization on basis of their efforts this section employs a model of collaborative production with imperfect contracting. As meta-organization a joint venture between two parties is assumed and the effort levels are represented by the investments in the joint venture. In a first step the joint venture with a unanimous sharing rule is illustrated. Then a third party decision maker is introduced that is able to observe the investment levels and that allocates the shares of the surplus by the means of a contest. Since this allocation is enforceable in court, the third party's decision determines the parties' outside option and hence their bargaining power over the surplus. By introducing the third party decision maker in this way, the underinvestment problem is solved because the investment is directly linked to the profit. The purpose of the model is therefore not to show that introducing a third party decision maker is beneficial, but to examine the relevance of his characteristics for resolving conflicts in meta-organizations. Therefore, the third party decision maker is assumed to be neutral, and to act in the interests of the parties,

which means that this model is ignorant to his incentives. This ideal situation serves as a benchmark for evaluating the characteristics of the third party decision maker.

To do so, first it is analyzed how strongly the third party decision maker weighs investments in his decision (decision elasticity), to study the importance of his domain knowledge. Next, certain ideality conditions are removed. By studying the effect of noisy observability, the model illustrates the importance of non-disclosure and access to confidential evidence. Imperfect enforcement is considered in order to show the relevance of the general and worldwide enforceability of the award. Finally, introducing lengthy proceedings illustrates how important it is to reach a decision quickly.

Consider two firms A and B, who jointly found a joint venture. The joint venture is in possession of a productive asset. Because of this ownership structure A and B jointly own the asset and, consequently, either of them can veto its use.

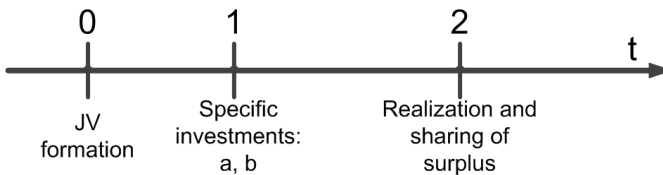


Figure 4.2: Timeline of the model

In order to make use of the asset, A and B need to make relation-specific investments a and b in period 1, which cannot be contracted ex ante for two reasons. Firstly, the production function is unknown at $t = 0$, which means that no party knows the optimal levels of investment ex ante. Secondly, while at $t = 2$ investment levels can be observed by the parties of the joint venture, they cannot be verified externally by a court. As a result, courts cannot enforce the contract of the joint venture. Since it is not possible to contract and to enforce specific

investment levels, the governance structure of the joint venture has to set the proper incentives in order to stimulate efficient investment levels.

In period 2 the joint venture produces a surplus according to a production function $F(a, b)$ which is continuously differentiable, concave in the investment levels and satisfies:

$$F(0, 0) = 0, \quad \frac{\partial F}{\partial x} > 0, \quad \frac{\partial^2 F}{\partial x^2} < 0 \quad \forall x \in \{a, b\} \quad (4.1)$$

Furthermore, it is assumed that the investment of both parties are equally efficient:

$$\frac{\partial F}{\partial a} = \frac{\partial F}{\partial b} \quad \forall a = b \in [0, \infty) \quad (4.2)$$

Given these assumptions there exists a first-best investment level that maximizes the overall surplus $F(a, b) - a - b$, which satisfies:

$$\frac{\partial F}{\partial a^{\text{FB}}} = \frac{\partial F}{\partial b^{\text{FB}}} = 1 \quad (4.3)$$

The two parties' individual payoffs are described by the following functions:

$$\pi_A(a) = z(a, b|g)F(a, b) - a \quad (4.4)$$

$$\pi_B(b) = (1 - z(a, b|g))F(a, b) - b \quad (4.5)$$

Thereby $z(a, b|g)$ describes the rule for sharing the joint surplus, which is determined by Nash bargaining. The outside options for the parties, namely the payoff in case of disagreement, depend on the form

of governance g , which can be either unanimous sharing ($g = \text{US}$) or determination by third party ($g = \text{TP}$).

4.3.1 Unanimous Surplus Sharing

In the baseline scenario without the governance of third party decision making the joint venture lacks a formal internal authority and hence decisions can only be reached collectively. This collective control is due to the fact that both parties own the joint venture jointly and hence either can veto decisions regarding its surplus. Because of the absence of formal authority and the consequential veto power, each party is able to block the profit distribution in case of disagreement. Consequently, a consensus is required for the implementation of a sharing rule. This implies that the parties' outside options in the bargaining stage are zero. Accordingly, this simple two-person Nash-bargaining without outside options (at $t=2$) leads to an equal sharing of the surplus:⁵⁰

$$z(a, b|\text{US}) = 0.5 \tag{4.6}$$

Given this sharing rule each agent only takes the marginal effect on his own profit into account when he chooses his investment level:⁵¹

$$0.5 \frac{\partial F}{\partial a^{\text{US}}} = 0.5 \frac{\partial F}{\partial b^{\text{US}}} = 1 \tag{4.7}$$

Notice, that the left-hand side of equation (4.7) describes the marginal benefits whereas the right-hand side describes the marginal costs of investing. Since the marginal costs in the first best solution are identical, the marginal benefits of the first order conditions of both (4.3)

⁵⁰For a proof see Appendix C.1

⁵¹For a proof see Appendix C.2

and (4.7) can be equalized:

$$0.5 \frac{\partial F}{\partial a^{\text{US}}} = \frac{\partial F}{\partial a^{\text{FB}}} \implies \frac{\partial F}{\partial a^{\text{US}}} > \frac{\partial F}{\partial a^{\text{FB}}} \quad (4.8)$$

$$0.5 \frac{\partial F}{\partial b^{\text{US}}} = \frac{\partial F}{\partial b^{\text{FB}}} \implies \frac{\partial F}{\partial b^{\text{US}}} > \frac{\partial F}{\partial b^{\text{FB}}} \quad (4.9)$$

Given assumption (4.1), the investment levels will be below the first-best solution:

$$a^{\text{US}} < a^{\text{FB}} \quad (4.10)$$

$$b^{\text{US}} < b^{\text{FB}} \quad (4.11)$$

Proposition 1. *The application of unanimous surplus sharing leads to an underinvestment by the joint venture's parties in comparison to the first-best solution.*

4.3.2 Third Party Decision Making

With an unanimous sharing rule the parties' outside options are zero in a dispute over the surplus. Therefore, the Nash bargaining in $t = 2$ between the two parties will lead to an equal sharing. However, this sharing rule means that the parties profit from the marginal product of their investments only partially. Because of this limitation in benefit of their investments' marginal products, the parties' incentives to invest are weaker than in the first-best solution. This incentive issue causes an underinvestment in the joint venture.

Third party decision making can remedy this underinvestment problem by making the parties' outside option contingent on their investment levels. Therefore, it is assumed that the third party decision maker is able to observe the individual investment levels in the same manner

as the joint venture's parties do in $t = 2$. This contingency allows the parties to improve their outside option (i.e. their payoff in case of disagreement) by investing and accordingly sets an additional incentive to invest. This means, while under unanimous sharing the incentive to invest is only provided by the internalized share of the marginal product of investment, the investment incentive under third party decision making is twofold. On the one hand the share of the marginal product that is internalized and on the other hand the prospect to improve payoff in the event of disagreement during the Nash bargaining stage.

This outside option improves in higher levels of investment because in case of a dispute the third party decides about the distribution of the surplus. Since the arbitrator does not know the optimal levels of investment, he is bound to reward higher investments only. Applying the rule – *the more a party invests, the higher will be his share of the surplus (4.12)* – the third party decision maker makes use of his ability to observe individual investment levels. By basing his distribution on the investment levels of the parties, the third party decision maker creates a contest for the surplus of the joint venture that sets additional incentives to invest. These additional incentives emerge because investing is the mean to compete this surplus-seeking contest. Because the outside options determine the sharing in a Nash bargaining and because the third party distributes the whole surplus, the factual sharing rule $z(a, b|TP)$ will be directly assigned by him even if no dispute arises.⁵²

⁵²Since the third party decision maker determines the distribution of the surplus in case of a dispute, the disagreement point $\{d_A, d_B\}$ for the Nash bargaining is given by his distribution decision. Given that the outcome of the Nash bargaining has to satisfy the condition $\max(x_A - d_A)(x_B - d_B)$ and that the third party assigns the whole surplus of the joint venture $F(a, b) = d_A + d_B$, it follows that the factual distribution of the surplus as an outcome of the Nash bargaining is equal to the distribution the third party decision maker would determine in case of a disagreement (i.e. $x_A = d_A$ and $x_B = d_B$).

$$\frac{\partial z}{\partial x}(a, b|g = \text{TP}) \begin{cases} > 0 & \text{if } x = a \\ < 0 & \text{if } x = b \end{cases} \quad (4.12)$$

While other views on dispute resolution usually emphasize the wasteful activities of the contest, such as litigation costs (c.f. Schweizer, 1989), this analysis concentrates instead on a non-wasteful mean of competition, namely the level of investment. To increase his outcome of the contest, each party has to raise his level of investment. This raise signals greater productivity to the decision maker, who, consequently, awards a greater share of the surplus to the respective party. Therefore, investing has two positive consequences for the parties' payoffs. Firstly, it increases their share of the surplus and secondly, it simultaneously increases the joint venture's surplus itself. Because of this instrument of competition, the efforts exerted in the contest are not wasteful but increase the contest's prize: the surplus of the joint venture (c.f. Chung, 1996).

Moreover, the third party is by assumption not biased towards any party. Because of that, he awards the same share of the surplus to each party if the investments are equal:

$$z(a, b|g = \text{TP}) = 0.5 \quad \text{if } a = b \quad (4.13)$$

The following general Tullock contest success function satisfies these conditions (Hirshleifer, 1989; Skaperdas, 1996):

$$z(a, b|g = \text{TP}) = \frac{a^m}{a^m + b^m} \quad (4.14)$$

The mass effect parameter m describes the shape of the sharing rule in relation to the relative investments of the two parties. Figure 4.3

illustrates this for the investment of A relative to a given investment of B. The mass effect parameter indicates the elasticity of the arbitrator's decision, which is at the point of equal investment ($a = \bar{b}$):⁵³

$$\varepsilon_z = \frac{m}{2} \tag{4.15}$$

If m is very small (e.g. 0.1), then the third party's decision is very inelastic. This means, that the third party decision maker departs only marginally from a 50:50 sharing of the surplus even if the investment levels differ dramatically and hence the contest sets only little extra incentives to invest.⁵⁴ On the contrary, if m is very large, then the decision elasticity of the third party decision maker is very high. A high decision elasticity indicates that the third party significantly alters the division of the surplus even if there are only minimal differences in the investment levels. Thus, a high decision elasticity implies that the contest provides strong additional investment incentives. Because of this relation between the mass effect parameter and the decision elasticity, it determines the intensity of the investment incentives that the contest creates. Therefore, the mass effect is an important parameter for the decision maker to set in order to balance the investment incentives of the joint venture.

⁵³For a proof see Appendix C.3.

⁵⁴ A special case is the situation if $m = 0$, in this situation the third party's decision is perfectly inelastic which means that he awards always half of the surplus to each party irrespective of their investment levels. Since this mimics the situation of unanimous surplus sharing, it is not further considered in the remainder of the section.

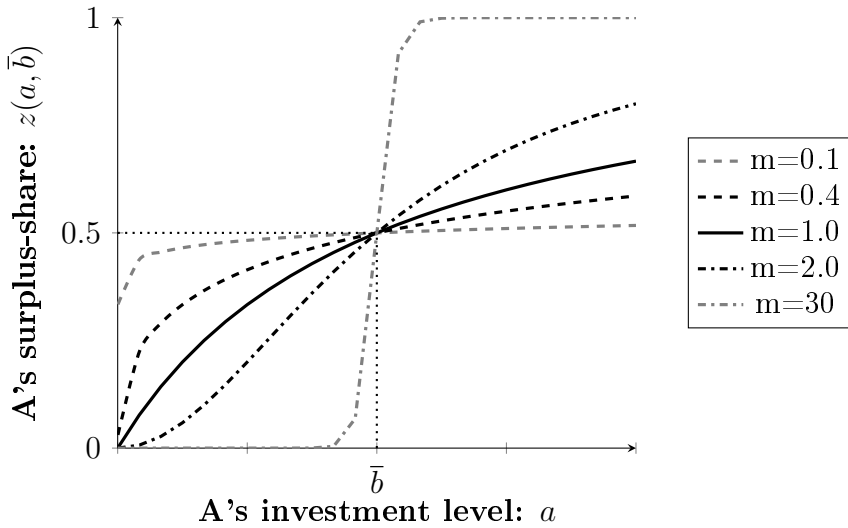


Figure 4.3: Mass effect parameter and decision elasticity

Including the third party decision maker's sharing rule into the two parties' individual profit functions (4.4)+(4.5) and maximizing these by choosing the investment levels, leads to the following optimality conditions:⁵⁵

$$\frac{ma^{m-1}b^m}{(a^m + b^m)^2}F(a, b) + \frac{a^m}{a^m + b^m} \frac{\partial F}{\partial a} = 1 \quad (4.16)$$

$$\frac{ma^mb^{m-1}}{(a^m + b^m)^2}F(a, b) + \frac{b^m}{a^m + b^m} \frac{\partial F}{\partial b} = 1 \quad (4.17)$$

Giving symmetry assumption (4.2), the investments of both parties are equally productive and hence both parties will face symmetric objective functions. Because of this symmetry both parties will invest in equilibrium the same amount ($a = b$). Therefore, equations (4.16) and (4.17) simplify to:

⁵⁵For a proof see Appendix C.4.

$$\frac{m}{4a}F(a) + \frac{1}{2} \frac{\partial F}{\partial a} = 1 \quad (4.18)$$

Solving for the marginal investment $\frac{\partial F}{\partial a}$ leads to:

$$\frac{\partial F}{\partial a} = 2 - \frac{m}{2a}F(a) \quad (4.19)$$

From (4.7) it is known that for unanimous surplus sharing the investment level is such that $\frac{\partial F}{\partial a^N} = 2$. Plugging this result into (4.19) allows to compare the investment level under third party decision making and unanimous surplus sharing:

$$\frac{\partial F}{\partial a} = \frac{\partial F}{\partial a^{\text{US}}} - \frac{m}{2a}F(a) \quad (4.20)$$

If a non-zero level of investment is assumed then any $m \in (0, \infty)$ ⁵⁶ means that $\frac{\partial F}{\partial a} < \frac{\partial F}{\partial a^{\text{US}}}$. Accordingly, it can be concluded given assumption (4.1) that the investment levels will be higher with third party decision making than with unanimous surplus sharing ($a > a^{\text{US}}$ and $b > b^{\text{US}}$).

Proposition 2. *If the third party decision maker sets the sharing rule with a non-zero mass effect parameter m , then third party decision making induces additional investment incentives which increase the investment above the level of an unanimous surplus sharing rule.*

Equalizing equations (4.3) and (4.18) gives the condition under which third party decision making induces first-best investment:

⁵⁶An $m = 0$ would lead to a 50:50 sharing of the surplus irrespective of the levels of investments (see supra note 54). This exactly mimics the incentives under the non-arbitration regime and hence the investment levels would be equal in both cases.

$$\frac{m}{4a^{\text{FB}}}F(a^{\text{FB}}) + \frac{1}{2}\frac{\partial F}{\partial a^{\text{FB}}} = \frac{\partial F}{\partial a^{\text{FB}}} \quad (4.21)$$

Solving for m :

$$m = 2\frac{\partial F}{\partial a^{\text{FB}}}\frac{a^{\text{FB}}}{F(a^{\text{FB}})} = 2 \times \varepsilon_{F,a^{\text{FB}}} \Leftrightarrow \varepsilon_{F,a^{\text{FB}}} = \frac{m}{2} = \varepsilon_z \quad (4.22)$$

Where $\varepsilon_{F,a^{\text{FB}}}$ describes the investment elasticity of production. It can be concluded, accordingly, that to achieve the first-best investment levels the investment elasticity of production must be equal to the third party's decision elasticity. Therefore, the sharing rule under third party decision making should be set in a way such that the elasticity of the sharing rule is equal to the elasticity of the production in the point of first-best investment.

Proposition 3. *Third party decision making leads to first-best investment if the elasticity of the decision rule is equal to the elasticity of the production in the point of first-best investment.*

The result that the elasticity of the third party's decision rule must be equal to the investment elasticity to reach first-best investment levels, circumstantiates the earlier claim that the third party has to carefully balance the incentives of the contest. If, on the one hand, he applies a very elastic decision rule, the additional incentives might be too strong and inveigle the parties to overinvest. On the other hand, if the third party applies a rather inelastic rule, the investment levels might be below first-best. Therefore, it is important for the third party decision maker to have expertise in the production technology in order to successfully calibrate the additional incentives the verification contest sets.

4.3.3 Noisy Observability

Besides the calibration problem, a third party decision maker could also suffer from noise in his observability of the individual investment levels. To analyze this, assume that α describes the degree of noise in the third party decision maker's observations of the investment levels, where $\alpha \geq 0$ (Amegashie, 2006). If $\alpha = 0$ then the third party can perfectly observe the individual investments. Thus, a $\alpha > 0$ means that the observability is noisy. The larger the degree of noise gets, the higher is the influence of chance in the third party's decision.

$$z(a, b) = \frac{a^m + \alpha}{a^m + b^m + 2\alpha} \quad (4.23)$$

Taking this modified sharing function with noise and plugging it into the parties' profit functions leads to the following optimality condition for the investment level:⁵⁷

$$\frac{\partial F}{\partial a} = \frac{\partial F}{\partial a^{\text{US}}} - \frac{m}{2} \frac{a^{m-1}}{a^m + \alpha} F(a) \quad (4.24)$$

In comparison to the optimality condition under no noise (4.20), in the last term $\frac{1}{a}$ changed to $\frac{a^{m-1}}{a^m + \alpha}$. To analyze this change, the sensitivity of the fraction $\frac{a^{m-1}}{a^m + \alpha}$ in α is examined. If there is a very low degree of noise the fraction approaches:

$$\lim_{\alpha \rightarrow 0} \frac{a^{m-1}}{a^m + \alpha} = \frac{1}{a} \quad (4.25)$$

This matches the situation under perfect observability. However, the larger the degree of noise gets, the lower are the additional investment

⁵⁷For a proof see Appendix C.5.

incentives the contest sets. If α becomes very large, the fraction $\frac{a^{m-1}}{a^m + \alpha}$ approaches:

$$\lim_{\alpha \rightarrow \infty} \frac{a^{m-1}}{a^m + \alpha} = 0 \quad (4.26)$$

This implies that the last term of equation (4.24) becomes zero and hence the investment levels under unanimous surplus sharing and under third party decision making with a very high degree of noise are equal. This means that high noise in the observability of the third party cancels out the additional investment incentives the contest sets.

Proposition 4. *If there is a very high degree of noise in the observability of the third party decision maker, then third party decision making fails to increase investment levels above the level of unanimous surplus sharing.*

4.3.4 Imperfect Enforcement

Another issue that could impair the effectiveness of third party decision making is the possibility that the decision maker's award cannot be perfectly enforced. This means technically that the third party decision maker is not able to distribute the whole surplus between the parties and that the parties have to unanimously share the remainder. If $\beta \in [0, 1]$ is assumed to be the severity of the enforcement problem, then the sharing rule changes accordingly:

$$z(a, b) = \beta \times 0.5 + (1 - \beta) \frac{a^m}{a^m + b^m} \quad (4.27)$$

Taking this modified rule with imperfect enforcement and plugging it into the parties' profit functions leads to the following optimality condition for the investment level:⁵⁸

⁵⁸For a proof see Appendix C.6.

$$\frac{\partial F}{\partial a} = \frac{\partial F}{\partial a^{\text{US}}} - (1 - \beta) \frac{m}{2a} F(a) \quad (4.28)$$

Comparing this optimality condition to the situation under perfect enforcement (4.20), one can see that the enforcement problem affects the additional incentives the contest sets. If β becomes very low the investment levels approach the levels with perfect enforcement. However, if the enforcement problem increases, the last term of (4.28) approaches:

$$\lim_{\beta \rightarrow 1} (1 - \beta) \frac{m}{2a} F(a) = 0 \quad (4.29)$$

This means that the additional incentives the contest sets vanish and hence the investment levels will be the same as under unanimous surplus sharing. This intuitive result highlights the importance of the enforceability of the third party's decision. If the decision award cannot be enforced at all, the joint venture's parties have to revert to unanimous surplus sharing.

Proposition 5. *If it is problematic to enforce the third party's decision award, then third party decision making fails to increase investment levels above the level of unanimous surplus sharing.*

4.3.5 Lengthy Proceedings

The effectiveness of third party decision making is also compromised when it takes a long time until a decision is reached. During such a lengthy proceeding the surplus of the joint venture is blocked and hence not accessible by the parties. This means that the period of time from investment in the joint venture to the payment of the surplus is relatively long. Investments with large gaps between investment and repayment yield smaller real returns than other investments with equal

nominal returns but shorter maturity. Therefore, lengthy proceedings by the third party decision maker harm the attractiveness of the joint venture investment and consequently cause underinvestment.

In order to formally analyze the problem lengthy proceedings generate, assume that the parties discount future returns with the factor $\delta \in (0, 1)$ (this could be e.g. the parties' finances costs) and that the length of the decision proceedings by the third party is denoted by l . Given these assumptions the parties' profit function becomes:

$$\pi_A(a) = \delta^l \frac{a^m}{a^m + b^m} F(a, b) - a \quad (4.30)$$

Maximizing this modified profit functions leads to the following optimality conditions for the investment of the parties:⁵⁹

$$\frac{\partial F}{\partial a} = \frac{1}{\delta^l} \frac{\partial F}{\partial a^{\text{US}}} - \frac{m}{2a} F(a) \quad (4.31)$$

If the third party's proceedings are not lengthy $l = 0$, δ^l becomes 1 and hence the equation reflects the result under perfect conditions. To analyze the parties' investment decision as the length of the proceeding increases, the derivative of optimality condition with respect to l is taken:

$$\frac{\partial F^2}{\partial a \partial l} = -\frac{1}{\delta^l} \frac{\partial F}{\partial a^{\text{US}}} \log(\delta) \quad (4.32)$$

Since $0 < \delta < 1$ it follows that $\log(\delta) < 0$. Given this and the assumption that the marginal investment is always positive $\frac{\partial F}{\partial a} > 0$, equation (4.32) implies that if l increases then the marginal product of investment increases as well. Because a larger marginal product of

⁵⁹For a proof see Appendix C.7

investment denotes a lower investment level, it can be concluded that as the third party's proceedings get lengthier the parties invest less into the joint venture.

Proposition 6. *If the third party's proceedings to determine the sharing of the surplus are lengthy, then third party decision making fails to remedy the underinvestment problem.*

4.4 Third Party Decision Making and the Boundaries of Meta-Organizations

The formal model in the previous section depicts the attributes – decision enforceability, latitude, information access, and fast decision making – as crucial for third party decision makers to effectively resolve disputes within meta-organizations. These four attributes clearly distinguish alternative dispute resolution from ordinary courts and, therefore, indicate that third party decision making is not a sheer substitute. Conversely, alternative dispute resolution ultimately relies on ordinary courts for the enforcement of its decision awards, which implies that these two are rather complements than substitutes. In this view a decision award reminds of a board resolution, which executes the decision authority of the entire organization but at the same time seizes its factual power from the fact that it can be enforced in court if necessary.

Considering the enforceability attribute in view of the power boundary conception (Santos and Eisenhardt, 2005), indicates that third party decision making lays within the boundaries of meta-organizations. By the means of third party decision making the meta-organization retains control over the resolution of internal conflicts because it autonomously selects the third party and also determines the procedural rules of dispute resolution. Equipped with this decision power the meta-organization ensures its sphere of influence on internal conflicts.

This influence is supported by the non-disclosure of dispute-related information by the third party decision maker, which secures that internal disputes are not becoming publicly known and hence the meta-organization can maintain its public image.

Not only the meta-organization is free in choosing the desired dispute resolution but also the appointed third party is usually granted ample leeway by the procedural rules. This latitude in the decision making process allows the third party to decide in favor of what he believes are the business interests of the meta-organization. In an analogous manner the board of directors in a classical organization is only bound by basic internal rules and the rather fundamental rules of corporate law. The *business judgment rule* gives the board considerable discretion in defining the business strategy and hence preserving the organization's sphere of influence. In this respect, the latitude attribute indicates that third party decision making lays within the power boundaries of meta-organizations.

While enforceability and latitude concern the power boundaries of meta-organizations, information access and fast decision making, as further attributes of third party decision making, should be assessed by means of the competence boundary conception (Santos and Eisenhardt, 2005). In respect to the access to business information, alternative dispute resolution reflects rather the attributes of a board of directors than of ordinary courts. The board of directors of a classical organization usually consists of managers with expertise in the industry of the organization that are able to evaluate business-related information while judges in ordinary courts are legal experts. Expertise in the meta-organization's industry provides third party decision making with the competence to assess business-related information more accurately than only legal expertise would permit. This information competence is strengthened by the fact a third party decision maker can more easily access relevant business-information. Because of the confidentiality

of the alternative-dispute-resolution proceedings, the parties are able to share trade secrets of the meta-organization and to use them for their argumentation. In front of an ordinary court these information, in contrast, cannot be presented as evidence since this would endanger the meta-organization's trade secrets. Therefore, the information competences of third party decision making are more similar to those of internal governance institutions, such as the board of directors, than they are to the information competences of external governance.

Fast decision making, as the second attribute that relates to the meta-organization's competence boundary, pinpoints likewise that the function of third party decision making rather reflects the function of the board than of ordinary courts. While courts require time for their proceedings, the board of directors is able to pass resolutions on short notice. This allows the organization to adapt to changing conditions in a dynamic business environment. This competence of adaptability is seized by the meta-organization by the use of alternative dispute resolution. The short-term decision making process of the third party facilitates fast resolution of internal conflicts and hence ensures that the meta-organization can quickly adapt to dynamic market conditions.

Discussing these four characteristic attributes shows that third party decision making operates within the power and the competence boundaries of meta-organizations. Moreover, the comparison with the board of directors and with ordinary courts reveals more similarities with internal than with external governance institutions. Therefore, conflict resolution by third party decision making should be considered an internal governance device of meta-organizations. It is integral to the design because internal conflict resolution gives the meta-organization a competitive advantage over market-based contractual-relationships between organizations.

4.5 Integral Part of Meta-Organizations

This chapter argues that third party decision making should be considered as an integral part of meta-organizations. This view shifts the analysis of third party decision making from mainly legal and contractual questions towards questions of organization design. By taking an organizational design perspective, the chapter applies a formal analysis to identify the relevant attributes of a third party to become an effective decision making body. Thereby it becomes apparent that controlling the reward distribution function is a decisive element for the success of meta-organizations.

The chapter underpins its argument by focusing on joint ventures that use commercial arbitration to settle disputes between the parties. This example has been selected because joint ventures are very prominent for inter-firm collaboration. Commercial arbitration addresses the issue of cooperation better than other forms of third party decision making, and it is no wonder that it is very appealing for joint ventures. Moreover, in an international context, arbitration has several institutional advantages over ordinary courts such as no home country bias, enforcement according to the New York convention, greater latitude in decision making, and better observability.

While arbitration in international joint ventures is an illustrative example, it is not the only case in which third party decision making is used in meta-organizations. Every interaction between self-interested agents poses the risk of a dispute about tasks, performance and profit sharing. Meta-organizations are no exception, conversely, they might be even more prone to fierce disputes due to their lack of formal authority. Therefore, it is not surprising that third party decision making has become an attractive governance mechanism for meta-organizations. Moreover *new forms of organization* (Puranam et al., 2014) use third party decision making to settle disputes between their

members (c.f. O'Mahony and Ferraro, 2007). The dispute resolution policy of Wikipedia, for example, formulates that third party decision making is required in the last stage of a dispute resolution process. There third party decision making assumes the form of an arbitration committee, whose members are third parties to the dispute but not to Wikipedia.⁶⁰

Third party decision makers in a meta-organization are third party to the dispute they are resolving but this does not mean that they are necessarily third party to the organization itself. In this regard, it seems reasonable to consider the opposite, namely that third party decision making, when adopted, is an integral part of the meta-organization. It is the glue that fixes the sometimes capricious contractual relations of meta-organizations when there is not only one locus of power. By the same token third party decision making is a vehicle to stabilize meta-organizations and to reap their specific benefits, while vertical integration or stand-alone production are only second best solutions in a globalized world with fragmented knowledge bases.

⁶⁰For the Wikipedia dispute resolution policy see https://en.wikipedia.org/w/index.php?title=Wikipedia:Dispute_resolution&oldid=673659518 and for the Wikipedia arbitration committee see https://en.wikipedia.org/w/index.php?title=Wikipedia:Arbitration_Committee&oldid=675583118 - accessed on August 11, 2015.

5 | Selection of Meta-Organizations⁶¹

5.1 Cooperation in Research Joint Ventures

The previous chapter considered third-party decision making as a governance mechanism to resolve disputes and balance the interests of the parties involved in a meta-organization. Taking a step back, however, rather than resolving conflicts it is usually better to avoid them. This raises the question how conflicts can be avoided in the specific context of meta-organizations.

One aspect that may help to avoid conflicts is to have a homogeneous group of members to the meta-organization, who are committed to the system-level goal of the meta-organization and who have similar attributes towards cooperation. To obtain such a homogeneous and cooperative group, governance mechanisms are required that enable the parties sort within the meta-organization according to the correspondence with the goal of the meta-organization, as well as their attributes towards cooperation. This way, uncooperative parties or those with a different goal can be sorted out. Such a mechanism is not

⁶¹Financial support from the Gesellschaft für experimentelle Wirtschaftsforschung in the form of the Heinz Sauermaun-Förderpreis 2015 is gratefully acknowledged.

only beneficial from the perspective of the meta-organization but also from the side of the individual party, who able to select the particular meta-organization that suits his characteristics best from the pool of potential meta-organizations (Yan and Luo, 2001, 19-20).

Of course, such a soft governance mechanism as group selection is more important in some environments than in others. In meta-organizations where the obligations and the benefits of the individual parties can be precisely specified, a contractual specification in combination with hard governance mechanisms such as third-party decision making may be more appropriate. An example could be franchises, in which both parties may be primarily interested in the financial costs and benefits involved, so that the common goal is relatively clear and the financial specifications can be agreed upon with relative ease at the start of the cooperation. Conversely, one could also think of various types of meta-organizations for which this is not the case. For instance, members of an industry alliance that sets common standards may have more difficulty specifying the exact goal and contributions at the outset. While all the members of the alliance might share the system-level goal that a common standards should be defined for the industry, there might be conflicting interests regarding its exact specification. The benefits of each individual party may therefore also differ depending on the solution that is ultimately chosen by the industry alliance. Although it would be possible to apply third-party decision making to balance these conflicting interests, it might not be the preferred governance mechanism for this situation. A more practical solution may be to foster cooperation between the members of the meta-organization. To achieve this, it might be more adequate to employ a governance mechanism that allows the parties to select a meta-organization of members with similar attributes.

Another example where the governance mechanism of group selection

is highly relevant is research and development joint ventures.⁶² In our contemporary, technology-driven economy, agents regularly need to cooperate in groups rather than by individual efforts in order to achieve virtuous outcomes. Research joint ventures are special legal vehicles, funded by multiple companies, with the purpose of conducting collaborative research and development. This cooperative effort fosters technological development because within the group, knowledge and talent from different parties are combined.

Despite their catalyzing effects on technological progress, research joint ventures are vulnerable to the public good problem. Collective research in joint ventures shares the two main characteristics of public good games, namely voluntary private contribution to and collective benefits from the group effort. Furthermore, it is not possible to formally enforce all necessary contributions to the Joint Venture because they cannot be perfectly defined in a contract. While formal payments to the Joint Venture can be contracted, the transfer of crucial knowledge or the assignment of skilled people (i.e. the level of efforts) is not contractible since these allocations are not externally observable. Consequently, the essential contributions to the Joint Venture can be considered as voluntary.

All cooperating companies profit from the developments of the joint venture. These technical enhancements typically result in patents, which can be utilized by all cooperation partners. Even if the Joint Venture is not able to obtain any patent, technological enhancements are indirectly absorbed by all participating companies. As a result of this mechanism, it is not possible to exclude any partner from the joint venture's outcomes and thus all benefit from its outcomes.

Given these two characteristics, an research joint ventures between different companies can be formally described as a public good game.

⁶²For an overview discussion see Vonortas (1997b, x-xi).

However, one should not consider a joint venture as a standard *one-shot* public good game. Firstly, repeated interaction between the cooperating companies is possible because the development process may encounter different stages with intermediate results or because the joint venture is intended to develop different technologies one after each other.

Secondly, the composition of the group operating the joint venture will not be fixed and exogenously given. Usually companies have a certain level of freedom to choose with whom they want to found a joint venture, although this choice is limited to those companies that have a similar development scope. Nevertheless, this introduces a choice stage to the public good game, in which reputation plays a key role.

Lastly, research cooperation seeking companies are able to participate in multiple joint ventures at the same time.⁶³ They are free to start a joint venture with company A and another with company B. This parallelism can serve different purposes; an important example for these seems to be the opportunity to *test* different partners because the right group composition is seen crucial to the success of the research joint ventures (Yan and Luo, 2001, 37-41; Tsakanikas and Caloghirou, 2004, 91). However, each company always has to manage its limited resources when engaging in the market for research and development cooperation and hence is only capable to undertake a limited number of research joint ventures in parallel.

Applying standard economic theory to analyze research joint ventures as a public good problem leads to the result that no rational agent contributes to its production because the individual benefits are lower than the individual cost. In contrast to this non-contribution prediction, there is robust evidence that people cooperate in public good

⁶³Vonortas (1997a) reports that in the time between 1985 and 1995 more than 30% of the companies, which were registered with the US Department of Justice as participating in research joint ventures, were engaged in more than one research joint venture.

experiments.⁶⁴ One important factor for cooperation in these experiments is that some subjects are conditionally cooperative. Conditional cooperators are willing to contribute to the public good if they believe the other subjects will contribute as well (Fischbacher et al., 2001). For the emergence of such a belief an environment is necessary that offers the possibility to build up a reputation for cooperation. Settings that allow for reputation building usually contain repeated interactions in which the subjects are able to identify their cooperation partners (Keser and van Winden, 2000). As a result, conditionally cooperative subjects contribute to the public good despite the theoretical prediction of free-riding.

Another environmental aspect that fosters the contribution of conditionally cooperative subjects is distinct boundary rules (Ostrom, 2009, 194-199). These rules allow the subjects to determine the group that is participating in the production of the public good, which increases the level of cooperation for two reasons. Firstly, an appropriate group formation mechanism improves the matching of conditional cooperators by excluding uncooperative agents *ex-ante* (Page et al., 2005; Charness and Yang, 2014). Secondly, the threat of expulsion from the group works as a non-monetary punishment mechanism that also incentivizes subjects with a lower willingness to cooperate *ex-post* (Cinyabuguma et al., 2005). In other words, a distinct set of entry- and exit-rules affects the average level of contribution in public good games positively (Ahn et al., 2008, 2009).

However, the boundary mechanisms that have been experimentally tested so far could be too artificial to reflect the market for research and development cooperation. This is because they employ rigid rules to manage the composition of the group. In contrast, a more market-like mechanism would on the one hand give freedom of partner choice but on the other hand would refrain from over emphasizing the possi-

⁶⁴For an overview see Ledyard (1995) and Chaudhuri (2011).

bility of re-formation. A mechanism that could solve this contrast is to offer each subject a choice between multiple, parallel public good games with different compositions of players. This choice allows the subject to select the group(s) he is willing to participate in. Hence, a conditional cooperator is able to choose the group partners which he believes are the most cooperative. This boundary mechanism reflects more adequately reality where agents usually face different options in which they can participate.⁶⁵

Moreover, to reflect reality more appropriately the subjects should not be completely unconstrained in their choice between the different games. On the contrary, the subject should be limited by fixed resources, as a company on the market for research and development cooperation is. This choice constraint can be established in an experiment by a common endowment over all games (Bernasconi et al., 2009; McCarter et al., 2014). With such a fixed budget, the subject's ability to contribute in different games is capped. As a result, two opposing effects of greater choice can be deduced. On the one hand, greater choice increases the ex-ante matching as well as the ex-post threat of expulsion (*sorting effect*). Therefore, the contribution level should rise. On the other hand, a greater choice of public goods amplifies the problem of coordination between cooperative subjects (*coordination effect*), which should negatively affect the contribution level (Corazzini et al., 2013).

An analysis of these opposing effects is interesting because it enhances

⁶⁵In the terminology of Hirschman (1970), who distinguishes the concepts *voice*, *loyalty* and *exit* as possible responses of a member to an organization demonstrating a decrease in quality or benefit to this member, the mechanism in this chapter focuses on the concept *exit*. Its intention is to study the impact on the cooperation of the latent threat of ultimately withdrawing from the relationship. To achieve a meaningful result for this question, the two other concepts by Hirschman are omitted. Nonetheless, these concepts are important to an holistic understanding of cooperation in meta-organizations. To judge which of these concepts is the most important, is a complicated and delicate task and therefore shall not be attempted here.

the understanding of the gradient of the cooperation level for the production of public goods as a function of choice. This understanding can help policy makers that seek to promote cooperation by the mean of partner choice. If, for instance, the gradient is continuously upwards sloping, then every increase in the amount of possible partners raises the overall level of cooperation and hence the policy should focus on increasing choice as much as possible. On the contrary, if the gradient of the function reaches a maximum at a certain point, then the policy maker should first attempt to estimate this maximal point and then implement a policy that concentrates on maintaining this optimal level of partner options. Therefore, it is important to understand the relative magnitudes of the underlying effects of greater choice if it should be used as a means to foster cooperation for the production of public goods.

This importance can be illustrated by the means of an example; when countries liberalize their foreign investment laws, this *inter alia* enlarges the pool for the selection of partners for research and development. A report by the Organisation for Economic Co-operation and Development (OECD) of 2008 finds evidence that trade liberalization has encouraged cooperation in research and development. In particular, this OECD report suggests that trade liberalization has played a significant role in the dramatic increase in research and development of the last decades.⁶⁶ However, it is debatable if a direct relation between the pool of possible cooperation partners and the overall level of cooperation perpetuates. Ghosh and Lim (2013) conclude that trade costs, or coordination costs, are essential for the link between trade liberalization and cooperation between firms, finding that firms cooperate more when these coordination costs are low. To provide another insight into further policy discussions this chapter tries to deepen the

⁶⁶See: Organisation for Economic Co-operation and Development, 'OECD Science, Technology and Industry Outlook 2008', OECD Publishing, Paris. Page 3. <http://www.oecd.org/berlin/41820706.pdf> - accessed on April 23, 2016.

understanding of the mechanism of increased choices for promoting cooperation in public good dilemmas.

5.2 Studying cooperation with laboratory experiments

Despite the theoretical prediction, cooperation between subjects is widely observed in public good experiments (Ledyard, 1995; Chaudhuri, 2011). The most prominent theory to explain cooperation in public good experiments is conditional cooperation (Fischbacher et al., 2001; Keser and van Winden, 2000). This theory states that a certain share of subjects in a public good experiment behaves conditionally cooperative. This means that these subjects are willing to cooperate by contributing to the production of the public good if the others do so as well.

Given the theory of conditional cooperation, a means to establish cooperation in a public good experiment is to sort subjects according to their attitude towards cooperation (Chaudhuri, 2011, 72-77). The principal idea behind this consideration is that if cooperative and non-cooperative subjects are sorted into separate groups, then the conditionally cooperative subjects only interact among their kind. In such a homogeneous-cooperative group, these subjects' condition to cooperate is met and hence cooperation will emerge between them.

The argumentation that cooperation levels are higher in sorted groups was confirmed by studies that applied an exogenous sorting mechanism (Gächter and Thöni, 2005; Gunnthorsdottir et al., 2007; de Oliveira et al., 2015; Burlando and Guala, 2005) as well as by studies that applied an endogenous sorting mechanism (Cinyabuguma et al., 2005; Page et al., 2005; Charness and Yang, 2014; Ahn et al., 2008, 2009; Gürerk et al., 2014). While the studies with an exogenous sorting

mechanism aimed to establish that sorted groups are more cooperative, the studies with endogenous sorting also tested whether subjects are able to form such sorted, cooperative groups by themselves. However, the sorting mechanism in these endogenous-sorting studies was mostly salient to the subjects and relatively formalized, in contrast to real-life group sorting interactions which are rarely governed by formal rules. Therefore, studying a less salient and rather informal sorting mechanism would improve our understanding of how sorting leads to voluntary cooperation in real-life transactions.

In real-life situations that require cooperation - such as in an organization - agents often encounter a limited set of potential group projects and face limited resources such as time. Therefore, these agents have to choose to which group project(s) to allocate their scarce resources. This situation-induced group-choice leads the agents to self-sort towards the most cooperative, hence promising, group project(s). This type of choice situation can be reflected in an experimental design which assigns subjects into multiple, parallel public good games that consist of different members (c.f. McCarter et al., 2014; Bernasconi et al., 2009; Corazzini et al., 2015). In this game setup, the subjects are able to choose among the parallel group projects. In order to induce a choice between these projects, the group projects are set up as substitutes which is implemented by a common budget constraint. This allows subjects with a cooperative attitude to self-sort into the group projects that are more cooperative. Therefore, presenting subjects with a group-choice positively affects the level of cooperation by means of sorting.

Besides this positive sorting effect, having to choose between multiple group projects also requires coordination between cooperative subjects. The reason is that these conditional cooperators not only have to signal their cooperative attitude and identify other conditional cooperators, but also have to collectively engage in the respective group project.

This coordination problem in a group-choice setting can impair the level of cooperation (Corazzini et al., 2015). Consequently, a choice between different groups also causes a *coordination effect* which negatively affects the level of cooperation.

The experiment reported in this paper analyzes the trade-off of group choice between improved sorting and the increased necessity of coordination. It aims to provide a deeper understanding of the sorting effect and the coordination effect of choosing among different groups for the production of a public good. Therefore, the first treatment variable of the experiment is the amount of group projects that each subject is participating in, which is either one (G1) as baseline or four (G4) as group-choice treatment. In order to disentangle the two effects the study applies as a second treatment variable two different contribution mechanisms to the public good: On the one hand a voluntary contribution mechanism (VCM), which serves as the baseline that triggers the sorting as well as the coordination effect. And on the other hand a weakest-link contribution mechanism (WL), which is a pure coordination game and hence mainly evokes the coordination effect.⁶⁷ This 2×2 design allows to test group choice as a mechanism to sustain cooperation and, moreover, to study the coordination effect separately from the sorting effect.

5.3 Cooperation in sorted groups

Ledyard (1995) surveys the existing experimental literature on public good games (PGG) until the mid-nineties. He identifies, as the main findings of the literature, a significant amount of voluntary cooperation is observed in one-shot as well as in repeated games. Average

⁶⁷In the literature, the name minimum-effort coordination game is used as a synonym for the weakest-link game.

contributions in the experiments range from 30% to 70% of endowment; however, the individual contributions are very heterogeneous and cover the whole strategy set from zero to full contribution. Factors that improve cooperation are communication between subjects, threshold or provision points, and higher marginal per capita return (MPCR). Finally, Ledyard concludes that there are three types of subjects: Nash players that are self-regarding as predicted by the theory (free-riders), players that are also self-regarding given sufficient high stakes but with the tendency towards mistaking due to decision costs and other-regarding preferences, and finally players with inexplicable (irrational) behavior.

Since the Ledyard survey, one major branch of the literature has been concerned with studying and identifying the different types of subjects, which vary in their other-regarding preferences and their beliefs regarding peers. The most prominent and most studied of these types is the conditional cooperator, who exhibits a behavior of willingness to cooperate provided that the other players cooperate as well (Keser and van Winden, 2000; Fischbacher et al., 2001; Gächter, 2007).

In their seminal paper Fischbacher et al. (2001) analyzed different contribution functions and defined four different behavioral types of subjects in public good experiments: Conditional cooperators, Free riders, 'Hump-shaped' (mixture between Conditional cooperators and Free riders), and Others. This categorization was later used for similar studies, which were conducted in different environments (Fischbacher and Gächter, 2010; Herrmann and Thöni, 2008; Kocher et al., 2008).

Given the theory of conditional cooperation, a homogeneous group of only conditional cooperators should reach higher contribution levels than heterogeneous groups or groups of only free-rider types. This means that a mechanism to create homogeneity within group social dilemmas could foster cooperation among cooperative agents. The most straightforward approach to test this hypothesis is to sort people

(according to their cooperation type) into different groups exogenously and then to compare the levels of cooperation in the different groups.

This was done first by Gächter and Thöni (2005). Their experimental design consists of two stages. The first was a classification stage (ranking experiment) to determine the subjects' cooperation types. This was done with a one-shot linear PGG in randomly formed groups of three without any feedback.⁶⁸ For the second stage subjects were sorted into groups to minimize the distance between their contributions in the first stage, i.e. the three most contributing subjects in the classification stage formed a group etc.

After this formation of groups, the subjects were informed about the grouping mechanism. This notification included information about their new group members as well as information about how much they contributed in the prior stage. Furthermore, the subjects were informed that they are playing the complete second stage with this group. Then the newly formed groups played ten-round repeated linear PGG with constant group membership.

The authors found a significantly higher contribution level than in the baseline treatment with random group forming. Additionally, the study applied a punishment protocol, in which the subjects had the opportunity to costly punish the other group members in the second stage. This modification had no positive influence on the contribution in the sorted treatment but improved cooperation in the random groups.

Another mechanism to establish homogeneous groups in a repeated public good game is used by Gunnthorsdottir et al. (2007).⁶⁹ In comparison to Gächter and Thöni (2005), the authors do not apply a sin-

⁶⁸MPCR = 0.6; Group size = 3; rounds = 10; contribution feedback after each round.

⁶⁹MPCR = 0.3, 0.5, 0.75; Group size = 4; rounds = 10; only own earnings feedback after each round.

gular classification stage but re-match the groups after each round is played. The re-matching procedure is done in two different ways, which represent the different treatments. In the sorted treatment, subjects are re-grouped depending on their contribution at the end of each round. As a baseline, a random treatment is used, where subjects are randomly re-matched into different groups after each round. To avoid strategic behavior, subjects are not informed about how the groups are formed. Both treatments were tested for three different MPCR (0.3, 0.5, 0.75).

The authors found a significantly higher contribution level and a slower decay in contributions among sorted groups than among random groups. Based on their data, the authors argue that the higher contribution level in the sorted treatment is due to the reduced number of interactions between (conditional) cooperators and free-riders. Additionally, the data shows that the more free-riders a cooperative subject meets on average per round, the higher the rate of decay in his contribution level is. Therefore, the authors conclude that the faster decay in the random treatment is driven by the higher number of interactions a cooperative type faces with free-riders.

De Oliveira et al. (2015) use a similar design as Gächter and Thöni (2005). However, for the classification they use the taxonomy by Fischbacher et al. (2001). Additionally, the type elicitation was performed over the Internet some days before the second stage of the experiment. In the second stage the subjects were matched in groups of three to play a repeated linear public good game with constant membership.⁷⁰ The matching creates either homogeneous (either only conditional cooperators or only selfish players) or heterogeneous groups (two players of one type and one of the other) according to their type in the classification stage. Whether the subjects know if they are in a homo- or

⁷⁰MPCR = 0.5; Group size = 3; rounds = 15; only own earnings feedback after each round.

heterogeneous group depends on the treatment. In the known distribution treatment, the subjects are informed about the composition of their group, whereas in the unknown distribution treatment they are not.

In line with the previous literature, contributions in homogeneous conditional cooperator groups are significantly higher than in the heterogeneous and homogeneous free-rider groups. Interestingly, for the homogeneous conditional cooperators the contributions are higher in the known distribution treatment than in the unknown distribution treatment. This suggests that information about the group members' attitude towards cooperation is an important factor in group social dilemmas.

Burlando and Guala (2005) also used a two-stage design to first categorize the subjects and then construct homogeneous groups. However, they applied a more complex mechanism for the classification stage consisting of four different methods: Strategy method (Fischbacher et al., 2001), Decomposed Game Technique (Offerman et al., 1996), measures of behavior in repeated PGG (Burlando and Webley, 1999), and a questionnaire. An important feature of this study is that the second stage was conducted in a later session, a week after the first. There the subjects played a repeated linear public good game in homogeneous groups.⁷¹ Burlando and Guala also found higher contribution levels in homogeneous groups. Additionally, the data suggests that there is a stable level of relatively high contribution (almost no decay) in homogeneous groups of cooperators and conditional cooperators.

However, as Chaudhuri (2011, 2009) argues, in most real-life situations we can choose the groups of people we are interacting with. If we are free to choose who we cooperate with, we also have the possibility to exclude someone from the group if we no longer want to cooperate

⁷¹MPCR = 0.5; Group size = 4; rounds = 20 (+3); feedback: own total earnings, own earnings last round, and average contribution level of the group.

with him. This can be seen as a form of non-monetary punishment that deters subjects from free-riding on the group's efforts. Cinyabuguma et al. (2005) evaluate cooperation levels under the threat of expulsion in a repeated public good game.⁷² Their design allows subjects to expel members from the groups after each round by majority vote. In their expulsion treatment contributions rose to almost 100% of the endowment and accordingly, contribution was significantly higher than in the baseline treatment without expulsion. This supports the intuitive conclusion that the threat of expulsion deters subjects from free-riding.

This finding raises the question of the influence of the endogenous formation mechanism in general on contribution levels in repeated public good games. In Page et al. (2005) the authors applied an experimental design with an endogenous formation mechanism to analyze cooperation in a repeated public good game.⁷³ The group (re)-formation was done at periodic intervals. After a certain number of rounds played, the subjects were informed about the contribution history of all other subjects in their session. Given this information, the subjects had to state a preference-ranking of all other individuals for the next interval. The re-formation was not done by satisfying the subjects' individual preferences as good as possible by grouping the 4 individuals with the highest overall ranking together etc. The subjects were informed about their new group members' contribution history and then continued to play the PGG in their newly formed group.

In comparison to the baseline treatment with random re-matching, the average contribution increased significantly. Additionally, the authors included a monetary punishment mechanism for both treatments, which allowed for costly punishment after each round played. The data reveals a similar contribution pattern for the re-grouping without pun-

⁷²MPCR = 0.2; Group size initially = 16; rounds = 15; contribution feedback after each round.

⁷³MPCR = 0.4; Group size = 4; rounds = 20; individual contribution feedback after each round.

ishment and the punishment without re-grouping treatment but with a stronger endgame effect in the only re-grouping treatment. The highest average contribution level was achieved in the sessions with a combined punishment and re-grouping treatment.

Charness and Yang (2014) use a more complex matching mechanism to study endogenous group formation. In a repeated public good game subjects are randomly matched into groups of three.⁷⁴ After an interval of 3 periods the re-matching mechanism starts. First, all subjects receive information about the individual contribution in their group and average contribution level in the other groups. After that, the subjects have the option to voluntarily leave their group. Then the remaining members can decide to expel someone from the group by majority vote. Finally, remaining groups and single subjects have the opportunity to merge. At this juncture, mutual agreement (at least 60% of both sides must approve the merger) is required to conduct the merger. After the re-matching the newly formed groups continue with the PGG for the next interval.

The design includes three different treatments: A baseline treatment with fixed groups of different sizes (3, 6, 9), a re-matching treatment with increasing returns to group size, and a re-matching treatment with increasing but capped returns to group size. In both treatments, increasing as well as capped, the average contribution level was significantly higher than in the baseline. Furthermore, the increasing treatment had slightly but significantly higher average contribution levels than the capped treatment. In addition, subjects in the increasing treatment formed larger groups than in the capped treatment.

In a set of two related papers Ahn et al. (2008, 2009) study the effects of endogenous group formation on normal (Ahn et al., 2008) and

⁷⁴MPCR depending on group size and treatment; Group size: initially = 3, minimum = 1, maximum = 9; rounds = 15+15; contribution feedback after each round.

congestible public goods (Ahn et al., 2009).⁷⁵ In the first experiment with a normal public good, the payoff function is chosen in a way to set incentives to form larger groups. On the contrary, with the modification of congestible public goods in the later paper, an optimal group size becomes crucial. In both studies, the authors tested the impact of three entry and exit rules: free entry and exit (baseline), restricted entry (i.e. entering subjects had to be approved by present group members by majority vote), and restricted exit (i.e. subjects could only leave a group if this was approved by the other group members by majority vote). The results of both papers show that under the restricted entry regime the average contribution level was higher than in the two others. Additionally, the second study reveals that for the congestible public good restricted entry rules lead to higher earnings for cooperative individuals and a higher likeliness of the formation of groups with optimal size.

Gürerk et al. (2014) use a public good game environment with endogenous group formation to analyze how subjects self-select into groups with different institutional settings. The design consists of two different groups ('communities') that play a repeated public good game.⁷⁶ In one group, the subjects have the possibility to costly punish monetarily other members after each round; in the other group they do not. Before each round, subjects can choose in which group they want to play this round (i.e. subjects are able to change the group every round). The data show that the group with the punishment institution has high contribution rates and grows over time. This allows for the following interpretation: in the beginning cooperative types use the punishment group as a device to signal their cooperative attitude. Later, other subjects learn that cooperation leads to high payoffs and join the punishment group as well. Free-riding does not occur because

⁷⁵Group size: minimum = 1, maximum = 12; rounds = 20; contribution feedback after each round.

⁷⁶MPCR depending on group size ($MPCR \approx 1.6 / n$); Group size: minimum = 1, maximum = 12; rounds = 30; contribution feedback after each round.

non-cooperator types are deterred by the potential punishment.

Conversely, Falk et al. (2013) do not apply a mechanism of endogenous group formation but they study the effect of social interaction by using a novel design where subjects play an economically identical game in two different groups at the same time.⁷⁷ With this design the authors are able to infer the effects of social interaction on behavior because this is the only variable that changes across the two games. The authors find that there is a substantial effect of social interaction on subjects' behavior in a social dilemma.

The design of Bernasconi et al. (2009, henceforward BCKM) has no mechanism to form groups but in the experiment the subjects have the choice between two different public goods.⁷⁸ This means that the subjects in the treatment group had to decide how to distribute their round endowment among the two games and their private account.⁷⁹ As a result, the subjects could decide to which degree they were willing to participate in each of the public good games. However, this choice was not a specific choice of group because the groups were randomly rematched after each round. The purpose of this design was it to test if *unpacking* a single public good game into two equal games promotes contributions and hence cooperation. The results suggest that there is a positive "unpacking effect" (Rottenstreich and Tversky, 1997 as cited in Bernasconi et al., 2009, 31) but the cooperative effort is still suffering from the decay in contributions over time.

McCarter et al. (2014, henceforward MSS) use a design that combines the approach of Falk et al. (2013), where subjects play identical public good games in two different groups, with the common budget

⁷⁷MPCR = 0.6; Group size = 3; rounds = 20; aggregated and individual outcome feedback each round.

⁷⁸MPCR = 0.5; Group size = 4; rounds = 12; aggregated contribution feedback after each round.

⁷⁹I.e. endowment = contribution game 1 + contribution game 2 + private account.

constraint for two games of BCKM to contrast the *divided loyalties* and the *conditional cooperation* perspective. This leads to a design, in which subjects play two economically equal repeated public good games in parallel but with a common endowment (single budget constraint) for both games.⁸⁰ In the baseline the composition of the two groups was equal for both games, whereas in the treatment the groups consist of different members. This group composition remains constant during the entire experiment.

The results show that the average contributions are significantly higher when the subjects are playing the two games with different groups. Moreover, the data suggests that subjects in the different-groups treatment shift their contribution towards the game with the larger average contribution. This result induces the interpretation that subjects with a cooperative attitude concentrate their resources in the more cooperative environment.

On the contrary, Corazzini et al. (2015) reach the conclusion that playing multiple public good games in parallel has a negative impact on contribution levels because it increases the difficulty of coordinating among subjects. In their study Corazzini et al. compare contributions to a single (baseline) threshold public good game with contributions to multiple threshold public good games.⁸¹ In the multiple games setting the subjects have to distribute their round endowment between four different games (in contrast to two in BCKM and MSS). The authors apply three different treatments in their design. In the *equally-efficient* treatment all four games have the same bonus for achieving the threshold (equal to the single game baseline bonus). In the *more-efficient* (*less-efficient*) treatment this bonus is higher (lower) for one of the four games. There is no re-matching of groups during the experiment.

⁸⁰MPCR = 0.4; Group size = 4; rounds = 20; aggregated contribution feedback after each round.

⁸¹MPCR = 0.5; Group size = 4; rounds = 12; earnings feedback after each round.

The authors find that contributions are higher in the single game baseline than in the two multiple games treatments *equally-efficient* and *more-efficient*.⁸² Moreover, the results suggest that subjects tend to concentrate their contributions to the more efficient game (if applicable). While this second result is in line with the findings of MSS and BCKM, the first that contributions are higher in the single game baseline is in conflict with them. An explanation for this difference in results could be the contribution mechanism to the public good. In contrast to a voluntary contribution mechanism, which was used in the previous studies, Corazzini et al. use a threshold contribution mechanism. This design with substitutive threshold public goods is intended to make coordination between the subjects more difficult and hence posed a coordination problem that affected contributions negatively.

Coordination problems are classically studied in the lab by the means of the weakest-link (or minimum effort) game. In a weakest-link game the outcome of a collaborative project is determined by the minimum contribution (the weakest-link) to this project. In contrast to a prisoner's dilemma, the players have no conflicting incentives and hence the problem of reaching the socially efficient outcome is only coordinative and not cooperative. Van Huyck et al. (1990) find that this coordination problem leads to inefficient coordination in an experimental weakest-link game. As important determinants of the coordination problem's magnitude, their study points to the group size for the collaborative project and the effort costs of contributing. The positive effect of smaller group sizes and lower effort costs was confirmed in later studies along with the efficiency enhancing influence of a fixed group-matching, full contribution feedback (as opposed to informing only about the minimum contribution) and pre-play communication (Devetag and Ortmann, 2007).

The effort costs of contributing to the collaborative project are the

⁸²There was no statistically significant difference between contributions in the baseline (single threshold public good game) and the treatment *less-efficient*.

marginal opportunity costs divided by the marginal benefit of contributing to the collaborative effort. Because they also include the potential benefit from contributing, the effort costs form a good measure of *how risky* it is to contribute above the minimum contribution is. In a weakest-link experiment with group sizes of two and three, Gøree and Holt (2005) study the effect of high and low effort costs on the efficiency of the coordination between the subjects. Their results show that for both two- and three-person groups, subjects in the high effort costs treatment did not reach an efficient coordination while subjects in the low effort costs treatment managed to coordinate efficiently on high effort levels. Moreover, the contributions in the low effort costs treatment followed an increasing path, which indicates that the dynamic coordination process is not driven by the minimum, but by the maximum contribution if the effort costs are sufficiently low.

The positive correlation between low effort costs and an increasing contribution path is confirmed by Brandts and Cooper (2006). In their design the subjects play for 30 rounds a weakest-link game, in which the effort costs change every ten rounds. In the first ten rounds the effort costs are high and, as observed in previous studies, no efficient coordination emerged. After ten rounds the effort costs were lowered in the treatment group, while they remained high in the control group. The results show an immediate increase in the contribution level for the treatment group with low effort costs, whereas in the control group the contribution stagnated. This positive effect of low effort costs was (partially) maintained after the effort costs were increased again after 20 rounds. To further study the sensitivity of the coordination-efficiency on the effort costs, Brandts and Cooper tested three different levels of low effort costs. However, their results suggests that there is no positive relationship between the magnitude of the effort costs and the increase in the contribution level. This implies that the positive effect of low effort costs on the cooperation efficiency is rather discrete than continuous.

Also for coordination games is the effect of group formation studied. Yang et al. (2013) employ the matching mechanism of Charness and Yang (2014) for a weakest-link experiment. Their results show that the subjects in the re-matching treatment formed large groups and that the level of coordination in this treatment approached perfect efficiency. This efficient coordination was not reached for large groups in the baseline treatment. The authors conclude that endogenous group formation promotes efficient coordination, especially for large group sizes.

Riedl et al. (2011) test the impact of endogenous group formation, in terms of neighborhood choice, on efficiency in coordination games. In a weakest-link game, the subjects can choose with whom they play. The data show an increase in efficiency between 40 and 60 percent in comparison to the baseline treatment with exogenous, random formation. The authors also attribute this result to the exclusion function of endogenous formation. They argue that in the early rounds high performers exclude low performers and hence the low performers ‘learn’ to perform high as well.

The effects of group formation are also studied in other environments than public good games. Herbst et al. (2015), for example, study how different groups cope with free-riding in a Tullock lottery contest.⁸³ They find that voluntary (endogenously) formed groups spend significantly more to win the lottery than involuntary (exogenously) formed.

To summarize briefly, we learn from this literature that homogeneous groups of cooperative-attitude subjects are reasonably well able to cope with social dilemmas, such as the public good game. This is predominantly driven by the fact that people cooperate when others do so as well (conditional cooperation). Therefore, to achieve high levels of cooperation it is beneficial when conditional cooperators interact with

⁸³See Buchanan et al. (1980).

other cooperators. Endogenous group formation has proven to be a fruitful mechanism for the matching of cooperators as well as the distribution of information about others' cooperation type. However, the endogenous formation mechanisms that have been tested so far in the laboratory might set up the formation process too saliently to reproduce formation processes in real life. On the other hand, group-choice, as an intermediate mechanism between fixed groups and fully endogenous formation, seems to be a good alternative because it reasonably well resembles daily life selection decisions. This especially applies if these selections are not exclusive but rather distributive as, for instance the allocation of a fixed endowment for instance. Additionally, the procedure of group-choice is fairly easy to understand for the subjects in an experiment and at the same time provides a mechanism that allows conditional cooperators to match in particular groups. There is reason to believe that sorting through group-choice has a positive effect on the level of cooperation. However, a greater pool of groups to choose from might induce a coordination problem that hampers cooperation and amplifies with the size of the pool. Consequently, the question arises how these two effects - sorting and coordination - affect the level of cooperation for a group-choice from a larger pool of groups.

5.4 Experimental Design and Hypotheses

The intention of the experimental design is it to separately identify the sorting and the coordination effect of group-choice. Therefore, the basic structure builds on the participation of the subjects in one or multiple group projects of the size of three ($m=3$). This basic structure is extended by the two treatment variables that specify whether the subjects have a group-choice (*first*) and what the contribution mechanism to the group project is (*second*).

The primary treatment variable is whether the subject have a group-

choice or not. This is implemented by varying the number of groups each subject simultaneously participates in (similar to the design of BCKM, MSS and Corazzini et al.). In the *No-Choice* treatment each subject participates in only one group, while in the *Group-Choice* treatment each subjects participates in four parallel groups.

The existence of four parallel groups in the Group-Choice treatment allows the subjects to sort themselves into one or multiple groups. The group-choice is not implemented by an explicit selection rule but by a common budget constraint for all parallel games. This common budget constraint is held constant among all treatments. This means that in the group-choice treatment each subject has to distribute his round endowment between the four group projects and his private account (see equation 5.1). The common budget constraint makes the group projects substitutes and hence induces self-sorting into the most preferred group(s). Therefore, group-choice in this context does not mean to select a single group but rather to engage in the contribution to the respective group project(s).

$$e = x_1 + \dots + x_4 + x_{private} \tag{5.1}$$

To allow the subjects in the group-choice treatments (G4) to sort themselves, the groups vary in terms of composition of members (see Figure 5.1). This means that each subject meets different (other) subjects in each group and hence has a real choice in terms of composition of the groups. This selection is intended to be based on reputation. For this reason no re-matching of the groups (*partner protocol*) takes place during the experiment. Additionally, the subjects are provided with individual feedback about the other subjects' contributions. However, this feedback is limited to subjects' contributions in the same groups. This means that if subject S plays with subject 1 in group A, then S is only informed about 1's contribution to A but not about 1's contri-

bution to his other projects or to his private account. In other words, subjects only learn the contributions of other subjects in the groups they are also member of. Thus it is uncertain to the subjects how much their co-players keep in their private account or contribute to other group projects they are participating in.

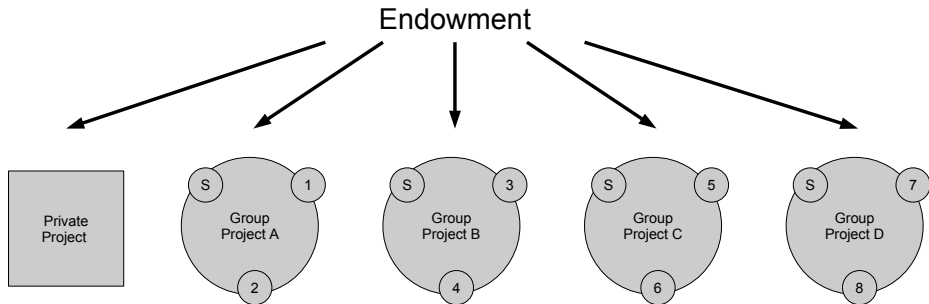


Figure 5.1: Example of different games and their group composition for a given subject (S)

To disentangle the sorting effect from the coordination effect of group-choice, the experimental design incorporates a second treatment variable which is the type of the game. In the *Cooperation* treatment the subject play a normal public good game in which a group-choice triggers both the sorting effect as well as the coordination effect. In contrast, in the *Coordination* treatment the subjects play a weakest-link game in which a group-choice only triggers the coordination effect. A comparison of the outcomes of both treatments, accordingly, allows to investigate the effects of sorting and coordination of group-choice for a cooperative game.

The type of game is altered by implementing different contribution mechanisms for the group project. In the cooperation treatment the contribution mechanism is a voluntary contribution mechanism (VCM). Hence, subjects in this treatment play a standard public good game, with the usual no-contribution incentive. This means that the round

payoff of each subject from a group project is the sum of contributions multiplied by β and divided by the number of group members m . Given that each group project consists of three members ($m = 3$), β is set to 1.8 to get a marginal per capital ratio (MPCR) of 0.6. Hence the round payoff are as follows in the no-choice (G1-VCM) treatment:

$$y_i = (e - x_i) + \frac{1}{m} \times \beta \times \sum_{j=1}^m x_j \quad (5.2)$$

And in the group-choice (G4-VCM) correspondingly:

$$y_i = (e - x_{i,1} - \dots - x_{i,4}) + \frac{1}{m} \times \beta \times \sum_{j=1}^m x_{j,1} + \dots + \frac{1}{m} \times \beta \times \sum_{j=1}^m x_{j,4} \quad (5.3)$$

For the coordination treatment the group projects' contribution mechanism is a weakest-link game (WL), which requires the subjects to coordinate on one of the Pareto-ranked Nash equilibria. This means that the round payoffs of each subject from a group project are equal to the lowest contribution times β . In order to be consistent with the cooperation treatment, β is as well set to 1.8. While the payoff multipliers in both the VCM and the WL treatments are equal for the group projects, they differ for the private account. In the VCM treatment the endowment, that is not contributed to any of the group projects, directly adds to the subjects' payoff. In the WL the private account is multiplied by α before it is added to the subjects' round payoff. This is done to adjust the effort costs (α/β) of the coordination game. In weakest-link experiments with relatively high effort costs, the coordination is usually not efficient (c.f. Table B.2 in Appendix B.2). Since the aim of the design is to identify a coordination effect between the no-choice and the group-choice treatments, it is necessary to have an efficient coordination in G1-WL. Therefore, α is set to 0.5, which

results in relatively moderate effort costs of 0.28. Based on this parameterization the round payoff are as follows in the no-choice (G1-WL) treatment:

$$y_i = \alpha \times (e - x_i) + \beta \times \min(x_i) \quad (5.4)$$

And in the group-choice (G4-WL) correspondingly:

$$y_i = \alpha \times (e - x_{i,1} - \dots - x_{i,4}) + \beta \times \min(x_{j,1}) + \dots + \beta \times \min(x_{j,4}) \quad (5.5)$$

These two treatment variables are combined in a 2×2 design. This results in four different treatments, which are illustrated in Table 5.1.

	Cooperation (Voluntary Contribution Mechanism)	Coordination (Weakest-Link Game)
No-Choice (one group)	G1-VCM (2)	G1-WL (2)
Group-Choice (four groups)	G4-VCM (4)	G4-WL (4)

Table 5.1: Overview 2×2 treatment design (number of sessions in parentheses)

This design is set up to test the following conjectures about the sorting effect and coordination effect of group-choice. In the cooperative treatments, G1-VCM is expected to reassemble the well-documented pattern of declining contribution to public good games (c.f. Chaudhuri, 2011; Ledyard, 1995). By giving the subjects the possibility to choose a group (G4-VCM), the contributions are expected to be higher than in the the no-choice treatment (c.f. McCarter et al., 2014; Bernasconi

et al., 2009). This sustained cooperation is expected to emerge because a group-choice allows to sort out uncooperative subjects and hence all conditionally cooperative subjects should interact with subjects with a similar attitude towards cooperation.

If the contribution-level in G4-VCM is higher than in G1-VCM, then this means that the coordination effect of group choice is either non-existent or that it is prevailed by the sorting effect. As the effort costs for the coordination treatments are set relatively low, the coordination in the no-choice treatment (G1-WL) is expected be efficient. If the coordination effect, as identified by Corazzini et al. (2015), exists then coordination in G4-WL should be less efficient than in G1-WL. Conversely, if no coordination effect exists then the coordination should be similarly efficient in G1-WL and G4-WL.

5.5 Experimental Procedures

The experiment was conducted in the ESE-Econlab at Erasmus University Rotterdam between April and June 2015. 12 sessions in total were performed: 2 for each of the treatments G1-VCM and G1-WL as well as 4 for each of the treatments G4-VCM and G4-WL. In each G1-session (G1-VCM and G1-WL) 12 subjects participated. In each G4-session (G4-VCM and G4-WL) 18 subjects participated. Each sessions lasted for 20 periods, which all were paid according to their outcome. In each period subjects received an endowment of twenty tokens ($e=20$) as common budget constraint for all group projects and the private account.

The experiment was computerized and subjects were sitting in separate cubicles. As experimental software z-tree was used (Fischbacher, 2007). Instructions (see Appendix B.7 and B.8) were read out loud to the subjects by the experimenter. After the instructions were read,

the subjects had to answer control questions to ensure to correct understanding of the instructions. The Experiment was performed fully in English.

In total 192 subjects participated in the experiment. These subjects were recruited from the ESE-Econlab subject pool by using ORSEE (Greiner, 2015). The average earning per subject was 11.74 Euro (min = 6.80 Euro, max = 14.90 Euro). Each sessions lasted for approximately 40 minutes (including reading the instructions, the control questions, and a short exit survey).

The largest group of subjects was enrolled in an economics program (40%), the second largest group was from a business administration program (33%), other programs included law, health and finance. The gender distribution of the subjects was relatively balanced (female: 41%, male: 59%). Almost two-thirds of the subjects were undergraduate students (63%), and the remainder was almost entirely composed of graduate students (for detailed demographic information see Table B.5 in Appendix B.6).

5.6 Experimental Results

The results of the experimental sessions confirm the theoretical hypotheses that were formulated in section 5.4. Introducing a group-choice improves the extent and stability of the cooperative behavior in a public good game. At the same time, it constitutes a coordination problem that countervails the positive sorting effect. In the present design with four parallel group projects, though, the sorting effect of group-choice prevails the coordination effect.

5.6.1 Global behavior

The results of the cooperative treatment are illustrated in Figure 5.2. Sub-figure (a) shows the average contributions over all periods of the experiment for the no-choice (G1-VCM) and the group-choice (G4-VCM) treatments, while (b) quotes the average round payoff per subject. The no-choice treatment (G1-VCM) replicates the pattern of declining cooperation that is observed in the literature.

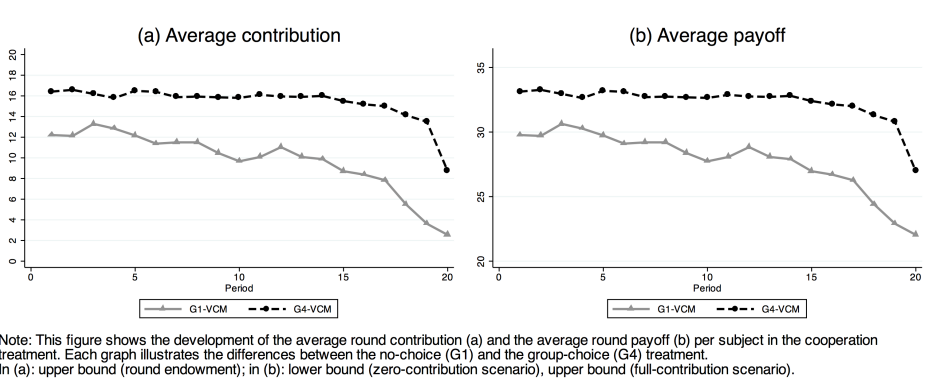


Figure 5.2: Results cooperation treatment

Figure 5.2 reveals that the level of cooperation is higher with group-choice (G4-VCM). A Wilcoxon-Mann-Whitney test shows that this difference in cooperation is significant at the 0.005 level (clustered: $p\text{-value} = 0.0046$, $n_{G1} = 8$, $n_{G4} = 8$; see Appendix B.1). Moreover, the contributions on G4-VCM are relatively stable until the last three rounds. At this point a substantial endgame effect exerts and the contributions drop visibly. The regression analysis in Table 5.2 confirms this visual impression. The group-choice treatment dummy (G4-VCM) has a positive coefficient that is statistically significant ($p\text{-value} = 0.000$, $n = 1920$). This means that contributions were on average 5.6 tokens higher in the group-choice treatment (more than 1/4 of the endowment).

The coefficient capturing the endgame effect is negative and also highly statistically significant (p-value = 0.000, $n = 1920$). Model (4) controls for the endgame effect and has a separate trend variable for each treatment. The trend in the no-choice treatment is highly statistically significant and has a negative coefficient (p-value = 0.000, $n = 1920$). This means that the contributions in G1-VCM dropped on average by 0.3 tokens per round. Conversely, the trend for G4-VCM is not significant and has a very small absolute coefficient (p-value = 0.202, $n = 1920$). Hence, the visual impression that in the group-choice treatment contributions were relatively stable in the pre-endgame stages is confirmed by the econometric analysis.

This finding differs from the findings of MSS and BCKM, who both observed also a declining pattern in the group-choice-like treatments. An explanation for these conflicting results can be found in the designs of the respective experiments. While the subjects in this experiment receive round feedback on individual contributions, the subjects in MSS and BCKM received only aggregated feedback. It, hence, appears important for the stability of the contributions in the group-choice treatment that subjects receive individual contribution feedback (on the effect of different types of feedback see e.g. Sell and Wilson, 1991).

Models (5)-(8) use the round payoff as dependent variable. Because the regression models do not contain any subject-specific variable and because there is no wasting of contributions in a public good game, the coefficients for the regressors on contribution and payoff correlate perfectly. Accordingly, confirm the models (5)-(8) the statistical results of the models (1)-(4) but do not facilitate any additional conclusion.

The outcomes of the coordination treatment are illustrated in Figure 5.3. Sub-figure (a) shows the average contributions over all periods of the experiment for the no-choice (G1-WL) and the group-choice (G4-WL) treatments, while (b) displays the average round payoff per subject. As intended by setting relatively low effort costs, contribu-

	Contribution				Payoff			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
G4-VCM	5.625*** (1.342)	5.625*** (1.342)	5.625*** (1.343)	3.014 (1.871)	4.500*** (1.073)	4.500*** (1.074)	4.500*** (1.074)	2.411 (1.497)
Trend		-0.259*** (0.0467)	-0.134** (0.0518)			-0.207*** (0.0374)	-0.107** (0.0414)	
Endgame			-3.252*** (0.594)	-3.252*** (0.595)			-2.602*** (0.476)	-2.602*** (0.476)
Trend (G1-VCM)				-0.320*** (0.0793)				-0.256*** (0.0634)
Trend (G4-VCM)				-0.0717 (0.0563)				-0.0574 (0.0450)
Constant	9.740*** (1.100)	12.46*** (1.308)	11.63*** (1.238)	13.59*** (1.660)	27.79*** (0.880)	29.96*** (1.046)	29.31*** (0.990)	30.87*** (1.328)
N	1920	1920	1920	1920	1920	1920	1920	1920

Note: This table reports the estimates and clustered standard errors (in parentheses) from a GLS regression with random effects. The dependent variable is in the models (1)-(4) the round contribution per subject and in the models (5)-(8) the round payoff per subject. G4-VCM is a dummy for the group-choice treatment, which is zero in the no-choice treatment (G1-VCM). Trend is a linear time trend, reflecting the round between 1 and 20. Trend (G1-VCM) and Trend (G4-VCM) are separate trends for the respective treatment. Endgame is a dummy variable, which assumes the value 1 in the rounds 18 to 20 and is 0 otherwise. The significance levels are stated accordingly: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5.2: Cooperation treatment regression results

tions in both coordination treatments were very high (see Figure 5.3-a). In the no-choice treatment (G1-WL) the contribution pattern matches the findings of previous low effort-cost experiments (e.g. Goeree and Holt, 2005, p. 358). Moreover, the coordination between the subjects was very efficient in the no-choice treatment. This can be read from the average round payoff, which is mainly driven by the group projects' minimum contributions. In the beginning the average round payoff increases substantially and then settles on a stable increasing trend. After approximately 60% of the experiment, the payoff reaches the maximum possible level at 36 per round. This means that the subjects accomplished to coordinate on contributing the whole endowment. This Pareto-optimal coordination level is maintained until the end of the game.

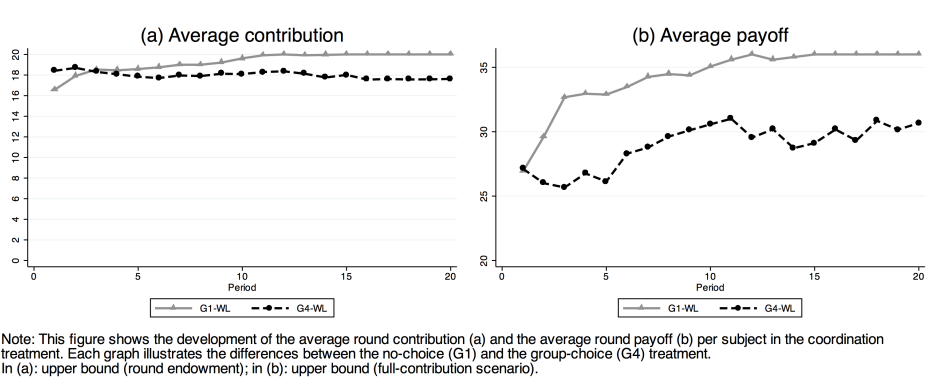


Figure 5.3: Results coordination treatment

Using the average round payoff as a proxy to measure the efficiency of the coordination, a Wilcoxon-Mann-Whitney test shows that the coordination efficiency is significantly different between the no-choice and the group-choice treatment at the 0.01 level (clustered: p -value = 0.0063, $n_{G1} = 8$, $n_{G4} = 8$; see Appendix B.1). In the group-choice treatment (G4-WL) coordination between the subjects also emerged but on a significantly lower level than in the no-choice treatment (see the G4-WL coefficients in Table 5.3).

Due to the low effort costs contributions were also high in G4-WL, starting from an even higher initial level than in G1-WL. While the contributions in the opening increased in G1-WL (p-value = 0.073, $n = 1920$), they followed a negative trend in G4-WL (p-value = 0.034, $n = 1920$). However, none of these trends is statistically significant. Towards the end the contributions in G4-WL settled around two tokens, or approximately 10% of the endowment, below the level in G1-WL.

In contrast to the trends in the contribution models, the trends in the payoff models are statistically significant. Both the G1-WL (p-value = 0.001, $n = 1920$) as well as the G4-WL trend (p-value = 0.001, $n = 1920$) have a positive coefficient. This means that in both treatments the round payoff and hence the efficiency of the coordination increased over the course of the experiment. The positive trend in G1-WL was, however, larger than in G4-WL, which can also be seen in Figure 5.3-b. While both treatments start from an equal initial payoff level, the round payoffs in G1-WL increased more rapidly than in G4-WL. Moreover, stagnated the round payoff from round 10 on around 30 in G4-WL, while they reached the maximal possible in G1-WL. This means that the coordination with four parallel group projects to choose from was less efficient and hence this result shows the coordination effect of group-choice.

5.6.2 In-group behavior

The analysis of the data on general behavior shows that the introduction of group-choice for a public good game with a voluntary contribution mechanism increases the overall cooperation level. It was argued that this is due to the fact that with a group-choice the subjects are able to sort out uncooperative peers. Table 5.4 provides further evidence for this sorting effect. It shows the change in group contribution

	Contribution				Payoff			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
G4-WL	-1.292* (0.618)	-1.292* (0.618)	-1.292* (0.619)	0.554 (1.349)	-5.343*** (1.576)	-5.343*** (1.576)	-5.343*** (1.576)	-4.176 (2.936)
Trend		0.00578 (0.0290)	-0.000184 (0.0366)			0.255*** (0.0733)	0.413*** (0.106)	
Endgame			0.0801 (0.265)				-2.131* (0.969)	-2.131* (0.970)
Trend (G1-WL)				0.138 (0.0767)				0.497*** (0.154)
Trend (G4-WL)				-0.0382* (0.0181)				0.386*** (0.120)
Constant	19.27*** (0.486)	19.21*** (0.724)	19.24*** (0.712)	17.83*** (1.291)	34.28*** (0.942)	31.61*** (1.481)	30.90*** (1.495)	30.03*** (2.440)
N	1920	1920	1920	1920	1920	1920	1920	1920

Note: This table reports the estimates and clustered standard errors (in parentheses) from a GLS regression with random effects. The dependent variable is in the models (1)-(4) the round contribution per subject and in the models (5)-(8) the round payoff per subject. G4-WL is a dummy for the group-choice treatment, which is zero in the no-choice treatment (G1-WL). Trend is a linear time trend, reflecting the round between 1 and 20. Trend (G1-WL) and Trend (G4-WL) are separate trends for the respective treatment. Endgame is a dummy variable, which assumes the value 1 in the rounds 12 to 20 and is 0 otherwise. The significance levels are stated accordingly: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5.3: Coordination treatment regression results

behavior for the two VCM treatments and selected other public good experiments. For each treatment the table states how many groups kept their contributions constant, decreased them, or increased them between the first round and a later stage of the experiment. The comparison is not made with the last round to exclude potential end-game effects in the analysis.

	0pct			5pct			10pct		
	C	D	I	C	D	I	C	D	I
G1-VCM	0	7	1	0	7	1	0	7	1
G4-VCM	0	72	24	2	72	22	11	67	18
Andreoni (1988) partners	0	6	0	0	6	0	0	6	0
Keser and van Winden (2000) partners	1	7	2	2	7	1	2	7	1
Nikiforakis (2008) punishment	0	1	2	0	1	2	0	1	2
punish & counter	0	4	2	0	4	2	1	4	1
VCM	0	9	0	0	9	0	0	9	0
McCarter et al. (2014) different	0	29	3	0	29	3	0	29	3
same	0	20	0	0	20	0	0	20	0

Table 5.4: Categorization of change in group contribution behavior in public good experiments between the first round and the average of 3 rounds between $0.8 \times T$ and $0.9 \times T$ (C: constant, D: decreasing, I: increasing; Xpct: margin for constant contribution +/- X% of endowment)

Table 5.4 shows that a majority of groups decrease their contributions in normal public good experiments. This is the same for the no-choice treatment (G1-VCM), in which 7 out of 8 groups lower their contributions to the public good. In contrast, in the group-choice treatment (G4-VCM) for 25% of the groups the contribution level increases in the course of the experiment. This means that when subjects are presented with a group-choice they pick the groups which are more cooperative and concentrate their contributions towards them.

Figure 5.4 states the development of the contribution spread for all four treatments. The contribution spread is the difference between the minimum and the maximum contribution to a group project. It, thus,

indicates the discordance within the group projects. This discord can be caused by two types of differences between the subjects: Firstly, by differences in the attitude towards cooperation and hence different preferences for the desired contribution level. Secondly, by differences in the beliefs of what the group contribution level will be. While in the cooperation treatment both play a role, only the differences in beliefs are relevant in the coordination treatment. This is because all subjects should prefer, given the payoff structure in the weakest-link game, the highest contribution level, regardless of their cooperation-attitude.

This can be observed in sub-figure (a), which compares the contribution spread for both the cooperation and the coordination treatment without group-choice. In the coordination treatment (G1-WL) the spread begins on a relatively high level and then decreases rapidly to zero as subjects form a common belief about the contribution level. Also the cooperation treatment (G1-VCM) starts with a high spread that decreases initially. Conversely to the coordination treatment, the spread levels between 7 and 8 and does not dissolve. The reason for this is that in the cooperation treatment differences in the cooperation-attitude contribute to the group discord and without group-choice the subjects have no possibility to self-sort.

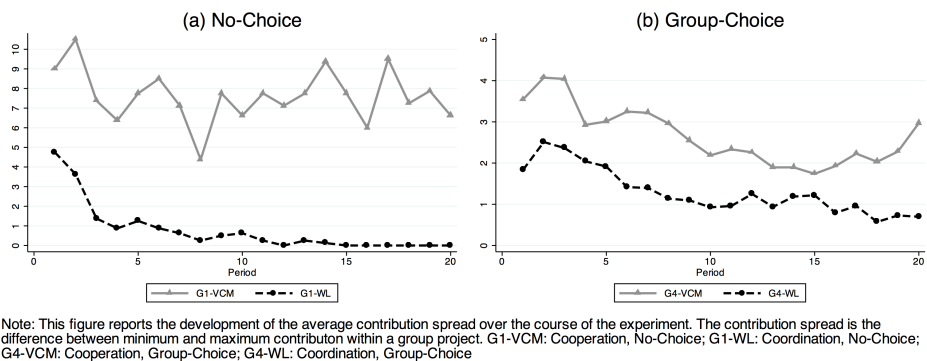


Figure 5.4: Min-Max contribution spread with group projects

The group-choice treatment allows for sorting but at the same time

increases the complexity of forming a common belief about the groups' contribution levels. In the coordination treatment with group-choice (G4-WL) the contribution spread started again on a moderately high level (see Figure 5.4-b) but in contrast to G1-WL, the spread increased in the beginning. Only after this initial rise, the spread began to drop, however not as rapidly as in the no-choice treatment. Also, the spread in G4-WL never reached zero but leveled slightly below 1. This coordination effect of group-choice occurs because finding a common belief is more difficult when each subject interacts in four parallel group projects, compared to only one in the no-choice treatment.

The coordination effect also causes disaccord in the G4-VCM group projects. However, in this cooperation treatment the disaccord can be elevated by differences in the subjects' attitudes towards cooperation. The consequences of this difference among subjects can be moderated by group-choice because it allows subjects to self-sort according to their cooperation attitude. The implications of this sorting effect can be observed in sub-figure (b). The spread in the G4-VCM treatment starts on an initially higher level than the spread in G4-WL (similar to G1-VCM and G1-WL), but as the experiment proceeds, the subjects in G4-VCM were able to sort. This sorting caused the difference in the contribution spreads between G4-VCM and G4-WL to fade away. In round 15, just before the endgame effect in G4-VCM exerted, the difference was down to less than 1. This convergence can be explained with the sorting between the G4-VCM group projects that remedied the cooperation-attitude disaccord, while the discoordination in beliefs persisted in the group projects both in the G4-WL and the G4-VCM treatment. Interestingly, both in the No-Choice (G1) and in the Group-Choice (G4) treatment the initial spreads of the cooperation (VCM) treatments were approximately 1.9 times higher than in the coordination (WL) treatments (G1-VCM/G1-WL=1.89; G4-VCM/G4-WL=1.93). This is almost equal to the factor that the private project was more profitable in VCM than in WL (factor 2),

which denotes the opportunity costs of contributing and hence could be seen as a proxy for the social risk of contributing.

The sorting effect can be further observed in Figure 5.5, which illustrates the development of the contribution distribution for all groups in the G4-VCM treatment. The groups are categorized into two classes according to their contribution level in the initial round. All groups with a contribution level above the median in the first period are labeled high, whereas all groups below the median are labeled low. For comparison both sub-figures show the contribution distribution of the G1-VCM treatment in the background in gray. In the groups with a high initial contribution level, the individual contributions developed towards the average group-maximum-contribution. This increasing and stable contribution path lies well above the path in the no-choice treatment (G1-VCM).

Conversely, in the groups with a low initial contribution level, the individual contributions dropped towards the average group-minimum contribution. This in-group contribution behavior matched very closely the path in the no-choice treatment. This means that subjects that are presented with a group-choice concentrate their contributions towards the more cooperative group(s), while contributions in the less cooperative groups follow the commonly observed path of declining contributions in public good experiments. Because of this sorting effect the general contribution level in a public good experiment is higher if there is a group-choice.

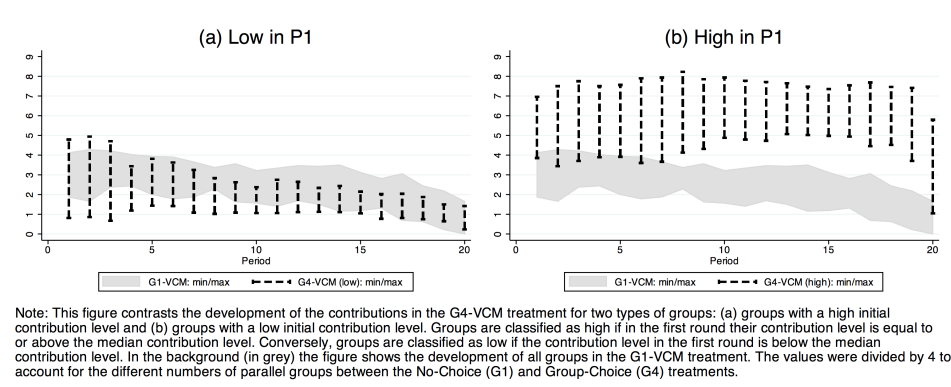


Figure 5.5: Contributions in G4-VCM for Low and High groups

Figure 5.6 visualizes the coordination effect in the coordination treatment. It states the development of the contribution distribution for all groups in the G4-WL treatment. The groups are categorized into two classes according to their contribution spread in the initial round. All groups with a contribution spread below the median in the first period are labeled low, whereas all groups above the median are labeled high. For comparison both sub-figures show the contribution distribution of the G1-WL treatment in the background in grey. The contributions to the groups with a low spread in the first round are clustered around the same constant level for the whole experiment. This anchor level basically reflects the contribution level towards the end of the no-choice treatment (G1-WL). While the average contribution level remained fairly constant, the coordination problem of group-choice still had an effect on the groups with a low initial spread. For these groups the contribution spread increased significantly in the first rounds and then only later recovered slowly.

Conversely, for the groups with an initially high spread, the spread reduced more quickly and finally its magnitude was even lower than for the groups with an initially low spread. However, this fast decrease came at the cost of a drop in the level of contributions. In the groups with a high initial contribution spread, the contribution level

fell substantially in the first rounds and then settled at a level approximately 25% lower than in the no-choice treatment (G1-WL). This means that if the subjects with a coordinative task are presented with group-choice, then their coordination will be less efficient than with no-choice. This coordination effect is twofold: groups with an initially, relatively efficient coordination (low contribution spread) suffer from the coordination problem by facing an increase in their min-max-contribution spread. On the other hand, groups with a less efficient coordination forfeit about 25% of the contribution level.

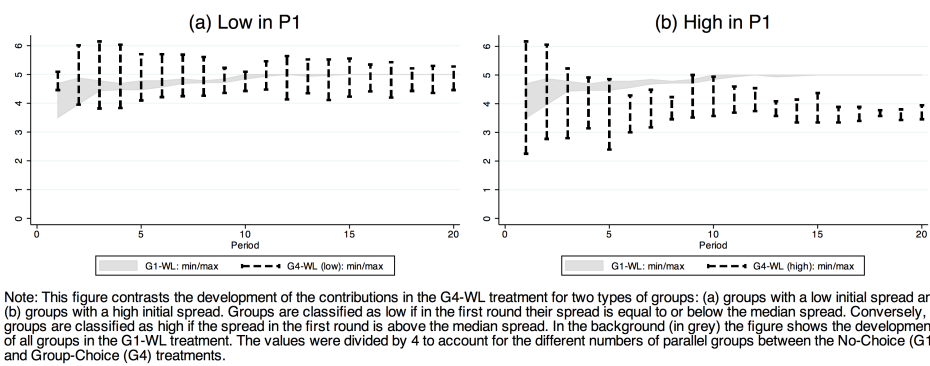


Figure 5.6: Contributions in G4-WL for Low and High groups

5.7 Partner-Selection: Sorting and Coordination

A cooperative climate is important within a meta-organization. It prevents conflicts between the partners and hence contributes to the achievement of the meta-organization's goals. A key factor in creating such a cooperative climate is the group composition of the meta-organization. If the parties composing the group of the meta-organization are homogeneous in their attitude towards cooperation and their goals, the cooperation within the meta-organization is easier. This is especially important for meta-organizations with goals that are difficult to formally specify in precise terms at the outset, such as research joint

ventures. These types of cooperations often have characteristics of a public good game and thus need specific governance mechanisms to maintain a cooperative meta-organization.

Group-choice can be seen as a governance mechanism to improve cooperation in situations with a public good game character. This is because a group-choice allows subjects to sort according to their cooperation attitude. This sorting effect allows conditionally cooperative agents to interact among themselves and hence drives the cooperation level up. However, having to choose between multiple groups also poses a coordination problem. This coordination effect impedes the identification of the counter parties' cooperation attitude and hence hampers the cooperation level.

This chapter's aim is to use a laboratory experiment to provide empirical evidence for these effects of group-choice and to study their influence on the cooperation level. The results of the experiment indicate that the option of group-choice has a positive impact on the cooperation level in a public good game. This is caused by the sorting effect of sorting out uncooperative subjects. However, group-choice also poses a coordination problem. Subjects in the G4-WL treatment were not able to efficiently coordinate on the Pareto-optimal contribution level. This means that despite the very low effort costs, coordination was approximately 10% less efficient in the group-choice treatment.

If with very moderate effort costs and only four parallel group projects the coordination effect is already 10%, then it can be expected to be substantially more severe with more group projects or higher effort costs. This would mean that the marginal coordination costs are increasing in the number of parallel projects. At the same time, it seems likely that the marginal sorting benefits are decreasing in the number of parallel projects. This means that there is an optimal amount of parallel projects that maximizes the level of cooperation. If the number of group-choices is increased beyond this optimal level, it will have

a negative impact on the cooperation level.

The results of this chapter's laboratory experiment indicate that group-choice can be a vital governance mechanism for cooperation. However, if it is used as a policy instrument, some important characteristics should be considered. Group-choice works best in environments with good information about the others' contributions. Moreover, effective sorting requires a repeated, long-term interaction. The coordination problem between the different choices is less grave if the effort costs of contributing are lower. Finally and most importantly, the cooperation level as a function of choices has an inverse u-shape. This means that an optimal number of choices exists and hence policy makers should not attempt to increase choices indefinitely.

Applying this finding to the example from the beginning of this chapter, it means that increasing the pool size by the means of trade liberalization or other policy initiatives does not necessarily, by itself, foster cooperation. The findings of the laboratory experiment confirm the conclusion of Ghosh and Lim (2013) that coordination costs play a role in this context. Therefore, if a policy maker wishes to use increasing the pool size as an instrument to foster cooperation in research and development and hence economic growth, it must at the same time ensure an environment with low coordination costs. For instance, such an environment with low coordination costs may be relevant in the context of the common European Research Area, which the European Commission aims to develop in order to create a larger pool for the selection of research partners for both academics and firms.⁸⁴

⁸⁴See the European Commission, "High Level Panel on the Socio-Economic Benefits of the ERA", A. Mitsos, A. Bonaccorsi, Y. Caloghirou, J. Allmendinger, L. Georghiou, M. Mancini, and F. Sachwald, June 2012. Pages 11-17. http://ec.europa.eu/research/era/pdf/high-level-panel-report_en.pdf - accessed December 16, 2014.

6 | Policy Implications

Today's technological development requires companies to become more and more specialized in order to maintain competitive. The consumer, at the same time, demands highly complex products, and moreover demands products to be inter-connectable with each other. To illustrate these trends, this thesis started out with the example of the development of telecommunication from Guglielmo Marconi's telegraphs to modern smart phones. The telecommunication sector is one of many markets where companies increasingly have to cooperate with each other in order to survive in the competitive environment. Such inter-firm cooperation is not only observed for research and development projects and the setting of common standards, but also to enter new geographical and product markets.

While these forms of cooperation can be very beneficial for the involved companies, they also pose certain risks. Not only might specific investments be held-up or knowledge and intellectual property be appropriated by the cooperation partner, the cooperation might also limit the company's decision space. Moreover, if the cooperation turns sour it may negatively affect the cooperating partners, for example in the form of reputational damage. Preventing this type of problems may become even more difficult when firms, as they often do, simultaneously cooperate with multiple parties from different fields.

The involvement of firms in multiple inter-firm cooperations precludes

vertical integration as a suitable way to overcome opportunism and to mitigate disputes. Vertical integration moreover involves considerable costs and loss of independence that would far outweigh the benefits of many types of inter-firm cooperations. Therefore, cooperating firms require a formalization of the cooperation, while allowing them to maintain their legal independence as much as possible. For that purpose, a specific organizational structure is required that encompasses the cooperating organizations, namely a meta-organization.

The overall goal of this thesis was to study the phenomenon of meta-organizations, and more precisely to examine the governance of meta-organizations. The thesis started out with a chapter discussing the distinction between meta-organizations and employment-based organizations, explaining why meta-organizations require different governance. Subsequently, chapter 3 empirically studied the growing importance of meta-organizations by the use of the example of joint ventures. On the basis of this discussion of meta-organizations, two examples of governance mechanisms were chosen that were discussed in detail in the subsequent chapters 4 and 5. The first was third party decision making as a means to resolve disputes, and the second was group choice as a way to create more cooperative groups and prevent disputes in the first place.

This final chapter summarizes the main findings of each chapter. It discusses possible implications of these findings for related streams of literature as well as for policy makers. Moreover, this chapter discusses some of the questions that the findings of the research raise, and provides an outlook for further research.

The subject of this thesis, meta-organizations, are organizations that themselves consist of organizations. In this thesis primarily the example of joint ventures is used, but also other types of meta-organizations such as strategic alliances, franchises and business networks are mentioned. Meta-organizations are distinct from employment based or-

ganizations because of the association relationship of the members towards the organizations. In an employment based organization, the individual member is an employee and hence she or he is associated with the organization by an employment relationship. In a meta-organization, in contrast, the individual members are companies, which cannot enter into an employment relationship with the meta-organization. Therefore, the member organizations - the companies - are associated with the meta-organization through ownership and contractual relations.

This difference in the association relationship has extensive implications for the obligations and rewards flowing from membership of the respective organization. An employee, as a member of an employment-based organization, has very generic obligations towards the organization. He or she is required to take directions of the management of the organization. The employee's rewards are precisely specified in the employment contract in the form of a wage and, in some cases, specific amenities such as a company car. Conversely, in a meta-organization the obligations of the members are specified in the association document and can vary from capital contributions to the performance of very specific activities. The membership rewards, however, are often not that formally specified and generally depend on the performance of the cooperation. The association documents may state certain rewards, such as the distribution of profits or the sharing of knowledge, but the value of these rewards can hardly be specified. In the best case, the benefits could be specified conditional upon the materialization of the aspired goals of the meta-organization.

These differences in benefits and obligations of membership impede the applicability to meta-organizations of governance mechanisms that are well established for employment-based organizations. Because of the specific obligations of members towards a meta-organization, the organization has no or only very limited formal authority over its members.

Therefore, it is not possible to use governance instruments that build on formal authority, such as board directives, in meta-organizations. The generic and various benefits parties expect from membership of a meta-organization also differ drastically from the mainly financial interests of shareholders, another stakeholder of employment-based organizations. While the instruments of corporate governance are suitable to protect the financial interests of shareholders, they might not be appropriate to safeguard the interest of members of meta-organizations that go beyond financial benefits. Therefore, meta-organizations require, and have developed, distinct governance mechanisms.

The use of distinct governance mechanisms in meta-organizations raises the question whether a specific meta-organization law would be necessary to govern meta-organizations. As mentioned, corporate governance mechanisms may not be suitable for members of meta-organizations, whose interests may concern the strategic direction of the meta-organization besides purely financial benefits. For example, members of meta-organizations concerning research and development projects, standard setting or market access may wish to have a say in the business decisions of the meta-organizations, even if they are relatively small members of the meta-organization. Corporate law rules on minority shareholder protection may not offer sufficient protection to such members of a meta-organization. Corporate law may thus not be sensitive enough towards flexible or hybrid arrangements such as meta-organizations (Amstutz and Teubner, 2009, ix).

Given that the interests of members of meta-organizations may concern benefits other than financial payments, governance mechanisms may rather be found in contract law. The members could specify their non-financial interests in the contract and stipulate the vote of each member in matters regarding the strategic direction of the meta-organization. However, in practice it may be difficult to specify all the activities and goals of the meta-organization in advance, as some of

these may only become clear as the meta-organization operates. Considering this uncertainty about the precise activities and goals, it is doubtful whether the various interests of the members of the meta-organization can be stipulated in a contract at the outset. To some extent, contract law may be able to accommodate this uncertainty, namely if contract law is viewed as being open to the "network expectations" of parties to a contract (Amstutz and Teubner, 2009, ix). These may arise when parties have concluded multiple contracts with one another. Network expectations can be defined as expectations that go beyond what is specified in each of the bilateral contracts between them. A traditional view of contract law may be blind to these expectations, as it considers that the legal consequences derive only from the performance obligations stemming from the various bilateral connected contracts. Viewing the contracts in a meta-organization according to the law of contractual associations, however, these contracts can be seen as "connected contracts" which form a legal constitution of the contractual network (Amstutz and Teubner, 2009, x).

Next to corporate law and contract law, which may play a role in the governance of meta-organizations, tort law may be relevant in the context of risks generated by meta-organizations towards parties outside the meta-organization. The activities of meta-organizations may cause harm to individuals and organizations performing activities for or on behalf of the meta-organization, or to external parties. However, as has been discussed in chapter 2, meta-organizations often cannot be clearly characterized under the traditional legal institutions contract and association. Meta-organizations may be established in different ways, resulting in various characterizations in terms of the law. Joint ventures, for example, can be set-up as a contractual arrangement, but alternatively in the form of a corporation. Because meta-organizations may have characteristics of both contracts and corporations, tort law may have difficulties in coping with the risks and opportunities posed by meta-organizations. Some of the implications of meta-organizations

for tort law are therefore further discussed below.

With the branches of corporate law, contract law and tort law potentially leaving gaps in the governance of meta-organizations, both internally and with respect to external parties, one may consider the possibility of introducing specific rules for meta-organizations. In studying the possible design of such a special law one might find inspiration in the German *Konzernrecht* that deals specifically with groups of companies. The *Konzernrecht* was introduced by the 1965 Stock Corporation Act and is meant to take account of the specific problems that arise in the context of groups of companies, particularly agency conflicts (Emmerich and Habersack, 2013, Rn 1-16; Roth, 2013, 256-259). The *Konzernrecht* aims to resolve agency problems by regulating conflicts between minority and large shareholders (Roth, 2013, 264) and specifies several duties of loyalty that controlling shareholders owe to minority shareholders (Baums and Scott, 2005, 40). The purpose of separate *Konzernrecht* rules is to provide the necessary organizational framework for deep changes in the structure of an enterprise. The *Konzernrecht* thus facilitates the concentration of control powers, while at the same time protecting minority shareholders and creditors (Prassl, 2015, 136). While creating a special branch of law has the advantage of addressing the specific problems of the concerned addressees, it may also involve problems. In the case of the *Konzernrecht*, for example, one such problem is its harmonization with related branches of law such as takeover law (Hopt, 2002, 36).

This begs the question whether a special law for meta-organizations is necessary and desirable. One relevant consideration is whether it is likely to succeed at designing a law that matches the needs of meta-organizations, when hybrid arrangements for doing business develop at a fast rate. One can compare Easterbrook's doubt regarding the possibility to design appropriate laws in the area of cyberspace, considering the fast rate at which technology develops (Easterbrook, 1996). East-

erbrook maintained that there was no more a "law of cyberspace" than there was a "Law of the Horse", meaning that specialized activities or issues - such as cyberspace or horses - can best be studied using general rules and principles of law. Easterbrook proposed to not "struggle to match an imperfect legal system to an evolving world that we understand poorly" (Easterbrook, 1996, 215), but to rather classify new activities that occurred with new technologies under current rules and laws.⁸⁵ Similarly, in the context of meta-organizations one could argue that the existing body of law has ample possibilities to accommodate the challenges of meta-organizations. Meta-organizations continuously develop, appearing in new forms and becoming increasingly transnational. Therefore, also in the context of meta-organizations a special branch of law might always lag behind in terms of accommodating the particular challenges of meta-organizations.

Nevertheless, even if a specific meta-organization law may not be necessary or desirable, the law could be further developed to accommodate the specific problems of these hybrid arrangements. In the context of cyberspace, Easterbrook has suggested that current law could incorporate new developments if we would clarify rules, create property rights where necessary and facilitate institutions to permit bargaining over property rights (Easterbrook, 1996). In a similar vein, one could ask what would be needed for current law to accommodate the particular problems involved in the governance of meta-organizations.

A possible way to accommodate the problems of meta-organizations may be to allow the law to be more flexible, or more customizable, to such modern forms of doing business. As discussed, various branches of law may be relevant in the context of meta-organizations, including corporate law, contract law and tort law. The boundaries between these various bodies of law may not always be clear. Besides the ex-

⁸⁵Some challenged this view, such as Lessig who argued that the development of cyberspace in fact did warrant new and evolving laws and legal values (Lessig, 1999).

ample of meta-organizations, this is also illustrated by debates about whether institutions like corporations, bankruptcy, and trusts should be conceived of as being a nexus of contracts or a specialized type of property regime (Merrill and Smith, 2001, 775). The various bodies of law tend to be structured in different ways, in line with their goals and depending on their particular subjects or addressees. With meta-organizations relying on aspects from several branches of law, ensuring the interoperability of these branches of law may be a fruitful way to accommodate the specific characteristics and problems of meta-organizations.

One could compare such an approach of making laws interoperable to the concept of interfaces that is very prominent in engineering. In software engineering, an interface is a precisely defined intersection between two or more software components (Sommerville, 2010, 39). It specifies the domain, procedure, and means of interaction of different components and hence enables the modularization of software. In other words, an interface can be seen as an agreement that stipulates how software developed by different programmers interacts.⁸⁶ This way, different programmers are able to write their source code independently from each other, while ensuring interoperability between the resulting software or system components. An interface thus represents an industry standard or a definition that allows users to cooperate without substantially affecting the way in which each user works. Another analogy for this concept are European Union Directives, which stipulate particular goals or minimum standards without dictating how each member state should implement them. Neither member state needs to know how other member states implemented the Directive for the aims of the Directive to be met. This way, goals such as ensuring the functioning of the European single market can be met without

⁸⁶For a further introduction of interfaces in software engineering see also the Java tutorial: <https://docs.oracle.com/javase/tutorial/java/IandI/createinterface.html> - accessed on June 23, 2016.

centralizing all law making. This is similar to software programmers not needing to know how another programmer implemented his software in order for the resulting system or product to work. An interface modularizes specific functions so that they can be combined as needed while keeping the system workable. As such, interfaces are a solution to the increasingly complex and interconnected design of systems and products.

The governance of meta-organizations, too, requires a complex and interconnected use of the law. Modularization of the law with distinct interfaces could allow for all the required elements to be put together, mitigating the complexity and interdependence involved in the governance of meta-organizations. A clear interface definition could allow for the use of corporate governance mechanisms in meta-organizations with a contractual basis. As an example, a corporation usually acts based on a hierarchical decision making process. On the highest level, a board of directors has a general power to take decisions that are binding for the entire organization. In contractual meta-organizations this is not so easily possible, because none of the parties has the full authority, and decisions are limited to the scope of the contractual arrangements.

Arbitration is a way to introduce a private party that has such an ultimate decision making power. However, in practice parties often spend valuable time and resources challenging the jurisdiction of the arbitrator (c.f. Barcelo, 2003), and hence the authority of the arbitrator may not be as straightforward as is the case for a board of directors in a corporation (Lew et al., 2003, 329). A clear interface definition that clarifies the scope of the applicability of arbitration in contractual agreements could mitigate this problem. Such an interface would specify the conditions in which arbitration can be used and under which circumstances.

Such an interface that clarifies the applicability of corporate governance

mechanisms in meta-organizations may not be highly necessary on a national level, because the interoperability of branches of law should be fairly clear in. In this context, an interface may look similar to a standardization of contracts, offering members to meta-organizations ways to include the most important governance mechanisms in their contract. However, on an international level such an internal coherence of the rules may be less evident. One could then think of an interface in terms of an international framework, comparable with, for example, European Directives or standards within the scope of the World Trade Organization (Kaufmann-Kohler, 2003).

Of course, the relevant governance mechanisms as well as their problems differ depending on the type of meta-organization that one considers. Chapter 3 portrays various types of meta-organizations, ranging from franchise systems to strategic alliances and business networks. Meta-organizations differ widely in structure, with some more closely resembling a market interaction and others being closer to fully integrated firms. Hence, while meta-organizations as a group differ from both market solutions and full integration, at the same time meta-organizations vary among one another in terms of the degree of control over decision rights, ownership of assets and centralized coordination.

Out of these types of meta-organizations, joint ventures are selected in chapter 3 as the working example to study the popularity of meta-organizations as well as their internal composition. This is done by the means of empirical data on the number of announced joint ventures over the last 50 years. The data indicates a strong increase in the popularity of joint ventures as a means of inter-firm cooperation from the mid 1980s onwards. This popularity dropped with the turn of the millennium and then settled on a somewhat lower level. This trend is very similar for all the major world regions, being the Americas, Europe Middle East Africa (EMEA) and Asia & Pacific. Analyzing the popularity of joint ventures in each of these regions further shows

that the majority of joint ventures in each world region is owned by parties from the respective region. This means, for example, that the majority of all joint ventures in China is held by owners from the Asia & Pacific region.

When considering the number of parties involved in joint ventures, it is found that a two-party joint venture is by far the most widely used set-up with a portion of almost 89% of all joint ventures. In terms of ownership structure, two distributions stand out for all possible numbers of parties. This is first an equal distribution of the ownership rights, meaning 50:50 in a two-party joint venture, 33:33:33 in a three-party joint venture, and so on for higher numbers of cooperation partners. This equal distribution ownership structure is the dominating mode for all party-sizes and represents almost 80% of the two-party joint ventures. The second most prominent distribution is one in which the largest party holds a share of 50% and the other parties share the remaining 50%.

These findings raise the question what could be the motivations for parties to choose these particular ownership structures. The equal distribution may be chosen in order to balance the power of the parties. In this case the joint venture may require specific governance mechanisms to take a decision in case the parties end up in a dispute with one another. The second form aims to solve this problem by installing a party that holds the majority of the shares and hence has the decisive vote in case of a dispute between the parties. However, as the Wahaha/Danone dispute, discussed in chapter 3, illustrates, having a majority share does not always prevent a dispute. In this case, Danone owned 51% of the shares in the joint venture, but nevertheless its legal control could not prevent that the employees carrying out the activities for the joint venture took orders from the head of Wahaha, with 49% the minority shareholder. In other words, having the majority share did not guarantee authority or formal power in terms of governance.

The parties ended up in a dispute that essentially revolved around the question which part of the profits were shared between the parties under the joint venture agreement. The parties ultimately turned to arbitration in order to reach a decision to resolve the dispute.

This indicates that arbitration can be an important governance mechanism for meta-organizations with all kinds of ownership structures. To investigate this further, an empirical study of the use of arbitration to resolve disputes in meta-organizations would be desirable. However, because of the private nature of arbitration, the vast majority of these cases is not published, limiting the possibilities to perform such an empirical study. Therefore, section 3.2.4 of chapter 3 presents a qualitative overview of published joint venture disputes that were resolved by arbitration. The analysis reveals some common characteristics of these arbitrated disputes. Similarly to the majority of the joint ventures, the majority of these disputes involved two parties. Moreover, these two parties in most disputes held an equal share in ownership, as is the case in the majority of two-party joint ventures. The disputes between the parties fall into two broad categories. The first concerns conflicts about the distribution of the profits or other benefits that the joint venture had produced, such as questions regarding the reinvestment of profits into the joint venture or alleged attempts to understate the profits of the joint venture by one party for personal gain. The second category concerns disagreement about the contributions a party made to the joint venture, such as a refusal by a party to continue to make contributions in accordance with the joint venture agreement.

To gain a better understanding of the role of third party decision making in meta-organizations, chapter 4 presents a formal model. This formal model was developed as an alternative to an empirical study which, as mentioned, is not feasible in the context of third party decision making instruments that are private, as is the case with arbitration. The formal model builds upon the qualitative analysis of disputes

and uses its results as parameters. This means that the stylized dispute of the model emerges between two parties that each hold a 50% share in a common joint venture, and that the dispute concerns the distribution of the profits in regards to the contributions of each party to the joint venture. The aim of the formal model is to identify attributes of third party decision making in meta-organizations that can be used as a basis for the theoretical, functional placement of third party decision making within or outside the boundaries of meta-organizations. The relevant attributes that the model identified are a good observability by and latitude of the decision maker, fast decision making and perfect enforcement. This means that a third party decision maker, in order to be an appropriate governance mechanism for meta-organizations, must be able to observe the individual contributions of the parties and have latitude to base the decision only on his conviction rather than on procedural rules. Moreover, the third party decision maker must be quick in reaching a decision in case of a dispute, and the decision must be enforceable. As chapter 4 discusses, arbitrators usually exhibit these attributes, which contributes to the understanding of the prominence of arbitration as a governance mechanism for meta-organizations such as joint ventures.

Having identified the attributes of an appropriate third party decision making mechanism for meta-organizations, chapter 4 further explores in section 4.4 whether such a mechanism should be considered an internal mechanism, within the boundaries of an organization, or rather as an external mechanism that operates outside of these boundaries. Moving away from the typical characterization of arbitration as a replacement for courts, a functional approach is taken towards the position of arbitration that considers the governance function of arbitration. To theoretically place third party decision making from this functional perspective, third party decision making is compared to other governance mechanisms in terms of their functions. These other governance mechanisms are the board of directors, as an internal mech-

anism, and an ordinary court, as an external one. Considering each of the identified attributes, third party decision making is found to be closer to a board of directors than to a court. First, the third party decision maker is usually granted ample leeway in making his decision, comparable to a board of directors. A court has considerably less latitude, being bound by rules of procedure and evidence. Secondly, the third party usually decides quickly, which again reminds of a board of directors rather than of a court. Moreover, similar to a board of directors a third party decision maker such as an arbitrator usually has good access to information on the parties and the joint venture, leading to a high observability. In terms of enforcement, a third party decision maker ultimately relies on a court, as does a board of directors, whereas a court already represents the final stage of enforcing a claim. Therefore, section 4.4 concludes that third party decision making is within the boundaries of a meta-organization and hence is an integral part of it. This also implies that forms of third party decision making, such as arbitration, are not a substitute but rather a complement to ordinary courts in the context of meta-organizations. In its functions, a third party decision maker is closer to being a substitute to the board of directors, a mechanism that many meta-organizations lack or have only with limited decision making power, particularly when ownership is equally distributed.

This view on third party decision making as an internal rather than external governance mechanism may have implications for the law governing third party decision making, and in particular arbitration. One of the main legal issues that arises concerns external parties that may be affected by an arbitrator's decision, even though these external parties were not involved in the proceedings (Brekoulakis, 2009, 1167). To exemplify this, imagine a multiparty commercial project that involves three parties (A, B and C). To fulfil the project, all the parties have concluded bilateral contracts with each other.⁸⁷ Suppose that a dis-

⁸⁷Multiparty commercial projects are usually executed through several bilateral

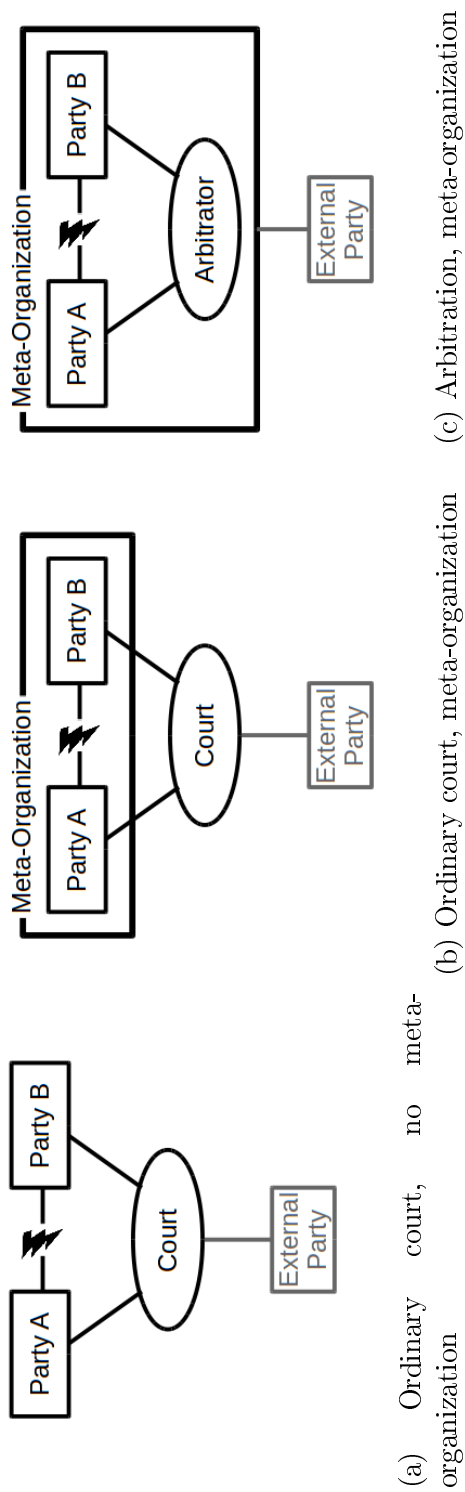


Figure 6.1: Interest relationships under different regimes

pute arises between parties A and B regarding the specific performance of the project. Because of the multiparty nature of the project, the dispute between A and B also concerns the legal and financial interests of C, who is an external party to the dispute. Figure 6.1 illustrates the interest relationships for this case under different regimes of dispute resolution and organizational structure. In the following, these three settings are discussed by the means of the example.

Suppose, first, that the dispute between parties A and B is adjudicated by a court, as depicted in sub-figure 6.1.a. In court proceedings, the problem of adverse effects on external parties is mitigated because the parties are determined on the basis of interests. The vast majority of national civil procedures provide for extensive mechanisms that allow external parties with a legitimate interest to participate in the bilateral proceedings and prevent possible adverse effects of the judgement (Brekoulakis, 2009, 1169). One such mechanism is that someone with an interest relating to the subject of the action and who may be affected by the outcome of the case, may request to be joined in the proceedings. The role of the court is to resolve the dispute between the parties with a legitimate interest, and the position of the court is in between these parties. In the example, party C can request to be joined in the proceedings in order to be heard. This way, the court takes the interests of C into account when ruling on the dispute between A and B.

Secondly, consider that parties A and B have formed a meta-organization in the form of a joint venture for the performance of their part of a project. Suppose that the joint venture agreement does not include a third party decision making clause - or dispute resolution clause - so that, again, the dispute is heard in court. Now, the court considers the dispute between the two members of the meta-organization (see sub-figure 6.1.b). Suppose that C, who has not concluded bilateral

contracts rather than one overarching contract (see Brekoulakis, 2009, 1168).

agreements with A and B but has contracted with the joint venture, is affected by the dispute between A and B. As before, C can make use of a procedural mechanism to participate in the proceedings, such as to be joined as a party, so that the court can take account of the interests of C when adjudicating the dispute between A and B.

Finally, imagine that the joint venture parties A and B have included a third party decision making clause in the joint venture agreement. Under this clause all disputes between the two parties that concern the joint venture are subject to arbitration. In line with the theoretical placement of arbitration in a meta-organization discussed in chapter 4, this third party decision making mechanism is part of the internal governance structure of the meta-organization. Because the arbitrator falls within the boundaries of the meta-organization, party C in the example is excluded from the internal governance mechanism, third party decision making, and hence is external to the dispute (see sub-figure 6.1.c). C only has an interest relationship with the meta organization as a whole, which is not taken into account by the internal governance mechanism, third party decision making. While this example has been discussed with an abstract, organizational lens, this view also corresponds with the legal reality.

In arbitration the parties to the proceedings are those who contractually agreed upon arbitration. Only those parties that explicitly consented to an arbitration agreement may participate in the arbitration proceedings (Lew et al., 2003, 141; Gaillard and Goldman, 1999, 298). While this contractual foundation of arbitration is one of the advantages that has contributed to the increasing popularity of this mechanism in the commercial community, it leaves external parties altogether excluded from the arbitration process. Any legal or financial interests they may have in the dispute between the parties bound by the arbitration agreement are in principle irrelevant (Brekoulakis, 2008, 5).

As a result, these external parties might be faced with unfavorable

consequences of such arbitral decisions. The lack of protection against adverse effects of arbitration proceedings to external parties has been listed as a major problem of arbitration (Brekoulakis, 2009, 1166-1167).⁸⁸ The difficulty in accommodating these aspects of a commercial dispute in which the interests or obligations of third parties are engaged has even been called "perhaps the greatest weakness of international commercial arbitration, as against proceedings before a municipal court" (Foxton, 2014, 1). Mechanisms to provide recourse to such external parties have therefore been widely discussed in the literature.

First, it has been discussed to what extent the mechanisms that prevent adverse effects to external parties in court proceedings apply, or should apply, in arbitration. For example, mechanisms to pierce the corporate veil or treat companies as groups of companies have been discussed as ways to include external parties in arbitration proceedings (Halla, 2015), as have third party joinder and intervention (Panfil, 2015). Others have discussed the role of courts in limiting the power of arbitration proceedings to bind third parties in future disputes involving the same issue (Cromwell, 2000; Lühmann, 2015, 127-129). Indeed, on various occasions civil courts have set aside arbitral awards or extended the scope of arbitration agreements and proceedings to include external parties based upon various constructions (Brekoulakis, 2009, 1170). Jurisdictions vary in the ways and extent to which external parties have recourse mechanisms against adverse effects of arbitral awards, and remedies are usually limited to domestic arbitration (Brekoulakis, 2009, 1169). The recognition of the interests of external parties in arbitration illustrates that these interests are in general worthy of protection.

A second way to provide recourse to negatively affected external parties would be to hold the arbitrator liable for such adverse effects. Some

⁸⁸The issue has also been debated in the context of investor-state arbitration (see for example Levine, 2011).

jurisdictions recognize liability of arbitrators, although liability is often limited and varies from country to country.⁸⁹ Generally the liability concerns breaches of obligations towards the parties during the course of the proceedings, for example failing to declare the existence of a fact or circumstance which affects his or her independence or impartiality or refusing substantial means of evidence (c.f. Franck, 2000; Guzman, 2000). Besides this limitation to damage resulting from culpable actions of the arbitrator, the civil liability of the arbitrator may extend to external parties, but is often limited to the parties involved in the arbitration process (Mullerat and Blanch, 2007). Nevertheless, this brief discussion does indicate that liability for arbitrators, as a concept, is not alien to many jurisdictions.

More importantly, the view that arbitrators should enjoy immunity from any civil suits for the exercise of their functions is usually justified on the ground that arbitrators should be treated akin to judges (Mullerat and Blanch, 2007, 105). However, chapter 4 has argued that arbitrators should be considered as a complement, rather than a substitute, to ordinary courts. Under this view, the argument to extend immunity to arbitrators does not hold.⁹⁰

Instead, the view of third party decision making within the organizational boundaries may warrant a different solution to the problem of affected external parties. A solution could rather be sought by considering remedies used for other internal governance mechanisms, such as a board of directors. Similarly to an arbitrator, a board of directors also takes decisions that are private and may affect external parties. External parties that suffered harm as a result of a board of

⁸⁹For an overview of the different approaches see Mullerat and Blanch (2007).

⁹⁰Moreover, even outside the context of meta-organizations Mullerat and Blanch (2007, 105-106) maintain that a number of differences between judges and arbitrators argue against immunity for arbitrators. For example, arbitrators are nominated and remunerated by the parties, derive their jurisdiction directly from the agreement of the parties, are accountable primarily to the parties and render decisions that cannot be appealed. None of these characteristics apply to judges.

directors' decision can turn to the organization, and use general civil liability mechanisms to get compensation for the adverse affects of the decision. Similarly, then, a meta-organization should be held liable towards external parties for any harm that the decision of an arbitrator caused them. In other words, the meta organization as a functional construct would be liable as a whole.

However, the theoretical definition of a meta-organization from an organizational perspective may not coincide with the legal definition of the meta-organization. This means that, from this theoretical view, there may not be a single legal entity that encompasses the entire meta-organization (c.f. Santos and Eisenhardt, 2005, 495). In contrast, an employment-based organization usually fully overlaps with the legal entity.⁹¹ Therefore, the liability concept applicable to normal organizations cannot be adopted without problems in the context of meta-organizations (c.f. Teubner and Aedtner, 2015; Becker, 2015). This is because it may not be clear which entity within the meta-organization is liable. Of course, for an external party that suffered harm, this internal question on the assignment of liability should not be relevant. In this regard, there might be a role for the policy maker in assigning the liability within meta-organizations, to provide external parties with a single access point for their civil claims. This would be similar to the way liability is structured in corporate law, which allows claimants to approach the organization and leaves the assignment of liability within the organization up to the internal decision-making structure.

In some contexts the answer to the question of assignment of liability may be straightforward, such as in case of a joint venture that has legal personality and capital. However, when considering a business network or alliance, it may be less clear which legal entity can be targeted by

⁹¹This is notwithstanding that employment-based organizations can have very complicated legal structures. Nevertheless, in contrast to meta-organizations, the ownership structure in employment-based organizations is generally clear.

injured external parties. Therefore, this finding poses a more general question for legal scholarship regarding the assignment of liability in meta-organizations.

While arbitration and other forms of third party decision making help to move beyond the particular issue of the dispute, the conflict might have damaged the cooperation in the long-term. For this and other reasons, it may be preferable to avoid disputes in the meta-organization in the first place. In order to facilitate a fruitful cooperation between the members of the meta-organization, chapter 5 illustrates the importance of carefully selecting the meta-organization, or group, with which to cooperate.

Chapter 5 studies the process of group selection for a meta-organization by the means of a laboratory experiment. The purpose of this study was to identify the parameters of the environment in which the selection process takes place that foster an efficient matching of cooperative partners. The study focuses on the consequences for cooperation of having a greater pool of groups to choose from. A detailed study of the experimental literature indicates the existence of two potential effects on the efficiency of cooperation. Building upon this literature, chapter 5 presents a hypothesis on how these opposing effects influence the level of cooperation. The first effect is a sorting effect, which means that through a large pool of potential groups, parties will be able to find a better match. Hence, a larger pool improves the sorting of parties into different groups according to their type and cooperative preferences, which in turn fosters cooperation. The second effect is a coordination effect, which might hamper the overall cooperation between the parties as the pool becomes larger. In a large pool of potential groups, parties have to interact and evaluate more potential cooperation partners and thereby expend valuable resources on search and information costs. The ultimate aim of the laboratory experiment was to contrast these two effects and to investigate which effect

prevails.

The experiment used a pool size of four, meaning that a given party had the choice to join four potential meta-organizations. The experiments made use of the public good game, which is the standard economic game to study cooperation. In the experiment, all groups played the public good game with the same parameters, meaning that the system-level goal of all the meta-organizations was harmonized. However, the meta-organizations consisted of different members, with potentially different individual goals and attributes towards cooperation. The results of the experiment indicate that for the tested pool size of four, the sorting effect prevailed over the coordination effect. This means that the sorting according to individual goals and cooperation attitudes was successful despite the effort that had to be expended to coordinate between the four different meta-organizations. Nevertheless, a specifically designed treatment of the experiment identified the presence of a non-negligible coordination effect. Given that the experiment was designed to have an environment with low coordination costs, it must be presumed that this coordination effect will be significantly larger in environments with less favorable conditions such as short, one-shot interactions or imperfect observability of contributions to the cooperative effort. Moreover, the findings indicate that too large pool sizes, such as in an international context, can hamper the sorting of partners according to their attitude towards cooperation (c.f. DiMatteo, 2010, 734).

A cooperative environment is important for the functioning of a meta-organization. As the experiment illustrates, group choice can serve as a governance mechanism to foster cooperative behavior. The underlying reason is that each party faces the risk that when he behaves opportunistically, the other parties will leave the meta-organization to find a new, more cooperative meta-organization. This threat of losing the possibility to cooperate thus serves as a way to deter opportunist-

tic behavior. This finding may have implications for a related stream of literature that concerns the role of trust in cooperation. This literature finds trust between cooperating partners to be valuable, as it facilitates closer relationships by reducing the tendency of firms to take advantage of each other (Zaheer et al., 1998). The level of closeness and trust towards the cooperation partner is considered to be one aspect of preventing opportunistic behavior of the cooperation partner, next to the level of detail of the contractual agreement (Wuyts and Geyskens, 2005). Cooperating partners may wish to draft detailed contracts in order to align interests, coordinate future activities and guide courts in case of a dispute. Parties may thus mutually design the contract as to prevent opportunistic behavior and enhance the collaborative effort (DiMatteo, 2010, 728). However, when high levels of trust exist in inter-firm relationships, there may be less need for safeguard mechanisms against a partner's opportunistic behavior (Gulati and Nickerson, 2008; Lew and Sinkovics, 2013, 16). In short, according to this literature trust may prevent opportunistic behavior and allow cooperating parties to rely more on self-governance and less on detailed contracts.

Nevertheless, an organization itself cannot trust another organization. Only individuals can trust other individuals, which makes trust less relevant in the context of meta-organizations. Considering the aggregate, an organization can show a cooperative attitude towards another organization. Mutual trust between the individuals within these organizations may be one of the factors that fuel such a cooperative attitude. At least as important, however, are governance mechanisms that foster the cooperative attitude such as group choice. The implication for the literature on trust and cooperation is, that although a long-lasting relationship is valuable for cooperation, it may be not so much the closeness of this relationship as it is the threat of leaving that fosters cooperation.

Such a threat of leaving only exists when parties can choose with which meta-organization they want to cooperate. When parties are free to join the meta-organization of their choice, the cooperation within that meta-organization is voluntary. This voluntariness is the essential element because it ensures that the self-governance of the cooperation is equitable and hence beneficial to all parties. The reason is that if a member disagrees with the way the meta-organization governs itself, this member can leave the meta-organization to find another one that better suits his preferences. For example, parties in a research joint venture that find the cooperation no longer beneficial to them can choose to end the cooperation and search for another research joint venture.

The situation is different if parties have no choice between different meta-organizations. As the laboratory experiment showed, cooperation levels were significantly lower when the participants had to cooperate in only one group and hence were not able to choose. For example, membership of the meta-organization may be required to obtain access to certain markets or technology platforms (Ellickson, 2016, 24). In these situations where participation in the meta-organization is not voluntary, the conditions of self-governance might not be mutually beneficial but might be set-up to mainly serve the strongest parties in the meta-organization. These stronger parties may execute a certain *monopoly power*, using the governance mechanism of the meta-organization to take decisions or set standards that serve as a barrier of entry. For example, a meta-organization for standard setting could be used by incumbent members to force new entrants to comply with standards that hamper innovations or require very high investments (Schaefer, 2000, 67-68). Therefore, group choice can be a prerequisite for fruitful self-governance of meta-organizations.

When such group choice, for some reason, is not available for a meta-organization, a form of regulatory oversight may be desirable. In prac-

tice, such regulatory oversight is also observed in this type of situations (c.f. Schultes, 2015; Glader, 2000). For example, competitors' collaboration to create technical standards may be subject to competition law, as well as to intellectual property law when patents are involved (Lundqvist, 2014, 3-7). Institutions such as antitrust authorities may intervene to prevent detrimental effects to the market of such meta-organizations. Antitrust authorities could limit the conduct of such meta-organizations by the use of competition law instruments, or, alternatively, governments could introduce market-specific regulations (c.f. Glader, 2000, 285-292).

7 | Conclusion

In conclusion, over the second part of the twentieth century inter-firm cooperations have become an increasingly popular phenomenon. These inter-firm cooperations often play out in the form of meta-organizations, which are organizations that are composed of the cooperating organizations. For this reason, meta-organizations can be characterized as a hybrid between market and hierarchy. Because of their hybrid form, meta-organizations are different from employment based organizations. Member organizations are associated with the meta-organization through ownership and contractual relations, which is in contrast with the hierarchical employment relationships that an employment-based organization is composed of. This difference in the association relationship has extensive implications for the obligations and rewards of the members of these two types of organizations. The obligations of employees in employment based organizations are generic, and their rewards are usually only of a financial nature. In contrast, members of meta-organizations generally have specific obligations to the meta-organization, and their rewards can be manifold, including access to new markets or technologies. The distinct nature of the obligations and rewards in meta-organizations impedes the applicability of governance mechanisms that are well established for employment-based organizations, such as the instruments building on formal authority or corporate governance. This thesis illustrated that, therefore, different governance mechanisms are needed for the

proper functioning of meta-organizations.

This thesis presented two examples of such governance mechanisms for meta-organizations. First, the thesis discussed the role of third party decision making as an internal rather than external governance mechanism for meta-organizations. The view of third party decision making as an integral part of the meta-organization implies that forms of third party decision making, such as arbitration, are not a substitute but rather a complement to ordinary courts in the context of meta-organizations. Secondly, the thesis considered the relevance of group selection for cooperation within meta-organizations. Choice from a larger pool of groups for cooperation can serve as a governance mechanism to foster cooperative behavior, as it allows parties to sort themselves according to their willingness to cooperate. At the same time, however, the existence of coordination costs in finding a suitable group poses a limit to the optimal number of groups to choose from.

The findings in this thesis illustrate the importance of the interaction between Law and Economics and other disciplines (c.f. Posner, 2010a,b). This thesis has attempted to open up this already interdisciplinary field towards another discipline, namely Organization Science. Taking the example of third party decision making, this thesis took legal knowledge to understand the role of arbitrators and brought this knowledge into Organization Science. Organizational theories were applied to the legal concept, providing new conclusions that were taken back into the legal understanding of arbitration. Combining the legal and organizational understanding of third party decision making thus revealed the view of the role of arbitration as an internal decision maker, and as a complement rather than a substitute to a court. These findings based on an integrated use of multiple disciplines show the relevance of broadening the paradigm within Law and Economics beyond neoclassical economics.

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Appendix

A | Appendix Joint Ventures

A.1 SDC Query

Database provider	SDC Platinum
Database name	Joint Ventures (JV)
Database sources	SEC filings and their international counterparts, trade publications, wires, and news sources
Database update rate	Daily
Database inclusion criteria	Agreements where two or more entities have combined resources to form a new, mutually advantageous business arrangement to achieve predetermined objectives
Selected date range	05/01/1960 to 05/06/2016
Selected fields	Alliance Date Announced, Participant Ultimate Parent Name, Participant Ultimate Parent Nation, Alliance Deal Name, Nation of Alliance, Activity Description, Cross Border Alliance, Percent Ownership by Participant

Note: Database information from Harvard Business School, Baker Library. <http://asklib.library.hbs.edu/faq/47760> - accessed on August 13, 2016.

Table A.1: Overview of the SDC database and query

A.2 Announced joint ventures: Omitted data

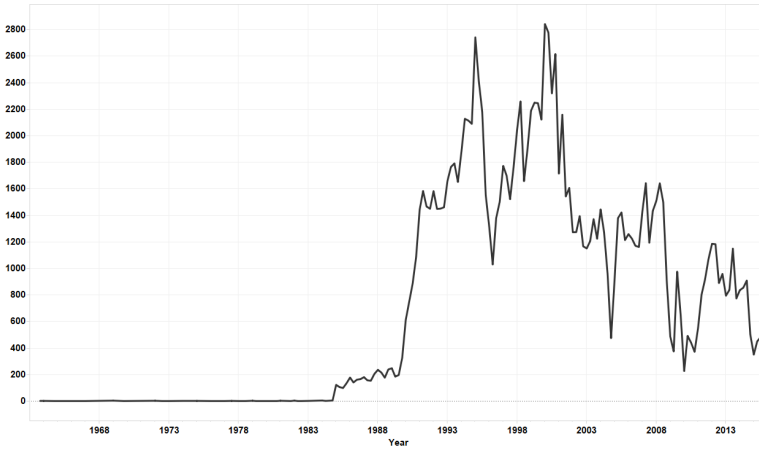


Figure A.1: Number of quarterly announced joint ventures (full dataset)

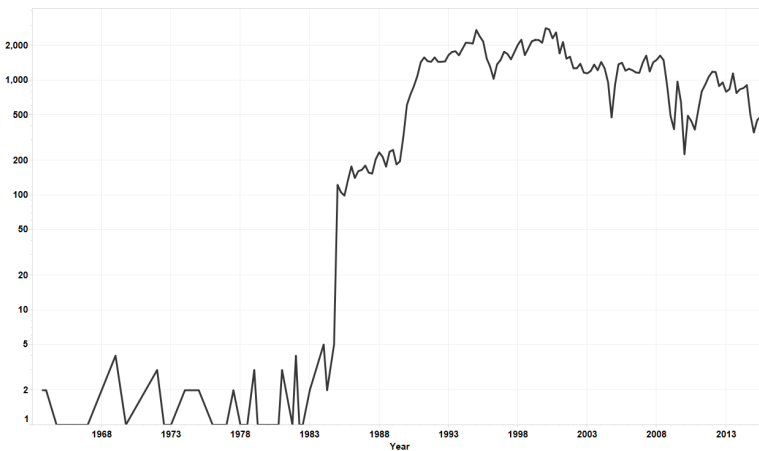


Figure A.2: Number of quarterly announced joint ventures (full dataset and logarithmic y-axis)

A.3 Ownership in Chinese joint ventures

Country	Ownership share
China	46.2%
United States	12.9%
Hong Kong	7.7%
Japan	7.6%
Singapore	3.1%
United Kingdom	2.5%
Germany	2.4%
Canada	2.1%
Other	15.5%

Table A.2: Country of origin of owners of Chinese joint ventures

B | Appendix Group-Choice

B.1 Nonparametric Tests: Wilcoxon-Mann-Whitney

Game	Tested variable	Aggregation unit	Sub sample	z	p
VCM	contribution	subject average		-4.453	0.0000
		cluster average		-2.836	0.0046
WL	contribution	subject average		2.561	0.0104
			opening	1.556	0.1197
			endgame	4.166	0.0000
		cluster average		2.205	0.0274
			opening	1.680	0.0929
			endgame	3.508	0.0005
	payoff	subject average		5.238	0.0000
		cluster average		2.731	0.0063

Table B.1: Results of Wilcoxon-Mann-Whitney tests: rank-sum between no-choice (G1) and group-choice (G4)

B.2 Parametrization of weakest-link experiments

	Coordination	Group size	Original format	Contribution information	$\alpha(e - x) + \beta \min(x)$	Effort costs
This design	-	3	-	all contributions	$\alpha = 0.5$ $\beta = 1.8$	0.28
van Huyck et al. (1990)	inefficient	2	$a = 20$ $b = 10$ $c = 60$	minimum effort	$\alpha = 10$ $\beta = 20$	0.5
	efficient	2	$a = 20$ $b = 0$ $c = 60$	minimum effort	$\alpha = 0$ $\beta = 20$	0
Goeree and Holt (2005)	inefficient	3	$c = 0.5$	all contributions	$\alpha = 0.5$ $\beta = 1$	0.5
	efficient	3	$c = 0.1$	all contributions	$\alpha = 0.1$ $\beta = 1$	0.1
Brandts and Cooper (2006)	inefficient	4	$B = 6$ $\dots = 5$	all contributions	$\alpha = 5$ $\beta = 6$	0.83
	efficient	4	$B = 8$ $\dots = 5$	all contributions	$\alpha = 5$ $\beta = 8$	0.63
	efficient	4	$B = 10$ $\dots = 5$	all contributions	$\alpha = 5$ $\beta = 10$	0.5
	efficient	4	$B = 14$ $\dots = 5$	all contributions	$\alpha = 5$ $\beta = 14$	0.36
Knez and Camerer (1994)	inefficient	3	$a = 20$ $b = 10$ $c = 60$	minimum effort	$\alpha = 10$ $\beta = 20$	0.5

Table B.2: Comparison of parametrization of weakest-link experiments

B.3 Regressions robustness check: Bootstrapping

	Contribution				Payoff			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
G4-VCM	5.625*** (1.045)	5.625*** (0.921)	5.625*** (0.969)	3.014* (1.237)	4.500*** (0.790)	4.500*** (1.015)	4.500*** (0.834)	2.411* (1.119)
Trend		-0.259*** (0.0389)	-0.134** (0.0442)			-0.207*** (0.0360)	-0.107* (0.0456)	
Endgame			-3.252*** (0.462)	-3.252*** (0.402)			-2.602*** (0.449)	-2.602*** (0.567)
Trend (G1-VCM)				-0.320*** (0.0472)				-0.256*** (0.0559)
Trend (G4-VCM)				-0.0717 (0.0433)				-0.0574 (0.0615)
Constant	9.740*** (0.776)	12.46*** (0.915)	11.63*** (0.797)	13.59*** (1.021)	27.79*** (0.671)	29.96*** (0.712)	29.31*** (0.848)	30.87*** (0.733)
N	1920	1920	1920	1920	1920	1920	1920	1920

Note: This table reports the estimates and bootstrapped standard errors (in parentheses) from a GLS regression with random effects. The dependent variable is in the models (1)-(4) the round contribution per subject and in the models (5)-(8) the round payoff per subject. G4-VCM is a dummy for the group-choice treatment, which is zero in the no-choice treatment (G1-VCM). Trend is a linear time trend, reflecting the round between 1 and 20. Trend (G1-VCM) and Trend (G4-VCM) are separate trends for the respective treatment. Endgame is a dummy variable, which assumes the value 1 in the rounds 18 to 20 and is 0 otherwise. The significance levels are stated accordingly: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table B.3: Cooperation treatment regression results (bootstrapping)

	Contribution			Payoff				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
G4-WL	-1.292** (0.427)	-1.292*** (0.358)	-1.292*** (0.383)	0.554 (0.884)	-5.343*** (0.761)	-5.343*** (0.972)	-5.343*** (0.878)	-4.176** (1.555)
Trend		0.00578 (0.0268)	-0.000184 (0.0284)			0.255*** (0.0417)	0.413*** (0.0488)	
Endgame			0.0801 (0.191)				-2.131*** (0.456)	-2.131*** (0.413)
Trend (G1-WL)				0.138** (0.0514)				0.497*** (0.0907)
Trend (G4-WL)				-0.0382 (0.0233)				0.386*** (0.0574)
Constant	19.27*** (0.234)	19.21*** (0.457)	19.24*** (0.404)	17.83*** (0.852)	34.28*** (0.445)	31.61*** (0.793)	30.90*** (0.772)	30.03*** (1.426)
N	1920	1920	1920	1920	1920	1920	1920	1920

Note: This table reports the estimates and bootstrapped standard errors (in parentheses) from a GLS regression with random effects. The dependent variable is in the models (1)-(4) the round contribution per subject and in the models (5)-(8) the round payoff per subject. G4-WL is a dummy for the group-choice treatment, which is zero in the no-choice treatment(G1-WL). Trend is a linear time trend, reflecting the round between 1 and 20. Trend (G1-WL) and Trend (G4-WL) are separate trends for the respective treatment. Endgame is a dummy variable, which assumes the value 1 in the rounds 12 to 20 and is 0 otherwise. The significance levels are stated accordingly: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table B.4: Coordination treatment regression results (bootstrapping)

B.4 Categorization in-group behavior

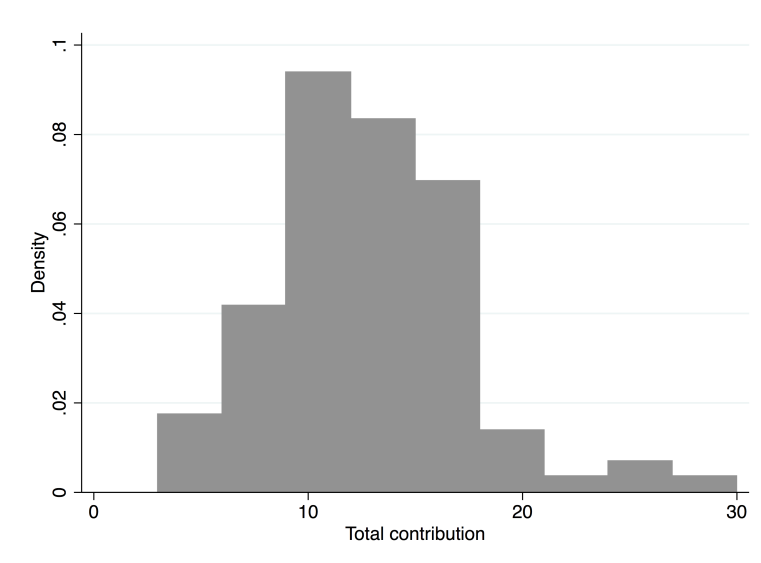


Figure B.1: Histogram total contributions to group projects in G4-VCM in first round

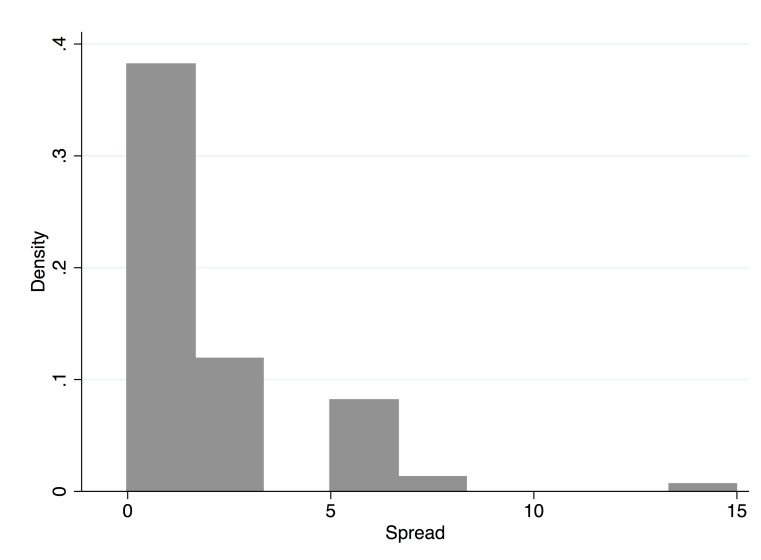


Figure B.2: Histogram contribution spread for group projects in G4-WL in first round

B.5 Contributions distribution

Figure B.3 illustrated the distribution of contributions over time for all four treatments. It confirms the findings of the previous analysis, which reports a decreasing trend in G1-VCM; a relatively stable trend with a substantial endgame effect in G4-VCM; an initial increasing and then very high level in G1-WL; and a first decreasing but then relatively stable level in G4-WL.

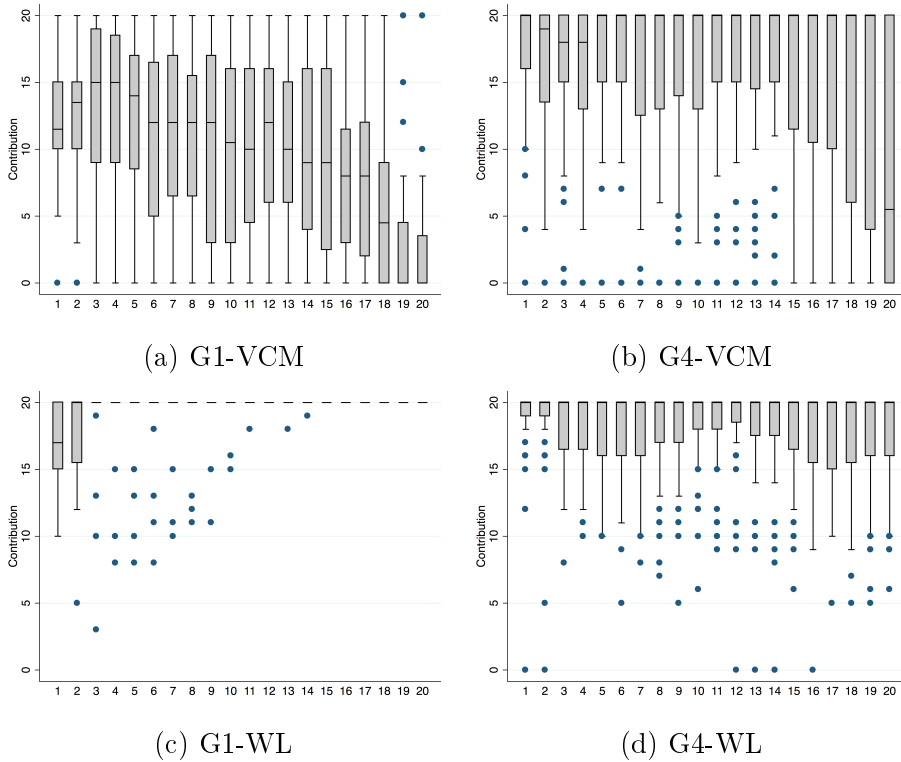


Figure B.3: Contribution distribution over time

B.6 Subjects Demographics

	Freq.	Percent
female	78	40.62
male	114	59.38
Total	192	100.00

(a) Gender

	Freq.	Percent
Bachelor	120	62.50
Master	66	34.38
PhD	1	0.52
other	5	2.60
Total	192	100.00

(b) Level

	Freq.	Percent
Business Economics	43	22.40
Econometrics	21	10.94
Economics	56	29.17
Economics and Law	19	9.90
Finance	12	6.25
Health	2	1.04
Law	3	1.56
Management	20	10.42
other	16	8.33
Total	192	100.00

(c) Field of Studies

	Freq.	Percent
..-18	6	3.12
19	33	17.19
20	31	16.15
21	26	13.54
22	32	16.67
23	22	11.46
24	14	7.29
25	8	4.17
26-..	20	10.42
Total	192	100.00

(d) Age

Table B.5: Summery of demographics of subjects

B.7 Instructions Treatment G4-VCM

Welcome!

Thank you for taking part in this study. Through your participation you can earn a considerable amount of money. Therefore, read the following instructions carefully.

Communicating with other participants during the session is not allowed. Should you have any questions, raise your hand and we will answer in private. Every participant will receive the same information and will read the same instructions.

Your Earnings

Your earnings will be calculated in **points**. At the end of the session these earning points will be converted into Euros at the following exchange rate:

$$80 \text{ points} = 1 \text{ Euro}$$

In addition, you will receive a show-up fee of 4 Euros for your participation. You will be paid in cash at the end of the session. No other participant will be able to know the payment you receive.

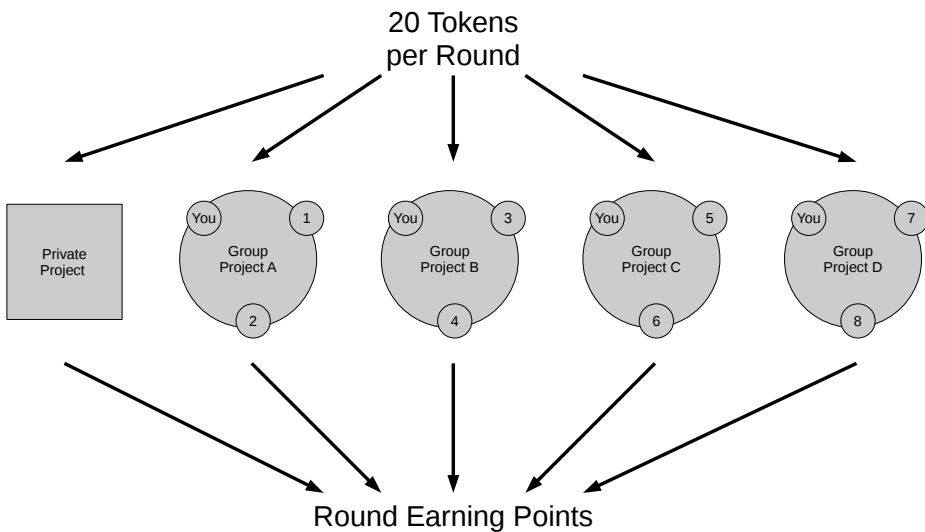
Your Assignment

Your assignment will last for 20 rounds. Each round you will receive **20 tokens**. Your task is it to divide these 20 tokens between five

different projects: **one private project** and **four group projects**. The group projects are called A, B, C, and D. The purpose of all five projects is to add points to your earnings each round.

Each of the four group projects has **3 members** (including you). This means you will interact with 8 other participants in total (2 other participants \times 4 different groups). These 8 participants are **different persons**. Therefore, you will not meet anyone in more than one group. The groups will remain the same for the whole assignment. This means you will interact with the same 8 other participants for all 20 rounds. You can identify them by a number between 1 and 8. However, this numbering is random and does not relate to the numbers on the desks.

The figure below illustrates your decision between the private project and the four group projects:



To divide the 20 tokens, you can allocate any whole number between 0 and 20 to each of the group projects. You cannot allocate more than 20 tokens in total. The tokens that you do not allocate to any of the group projects will automatically be allocated to your private project.

The group projects add differently to your round earnings than your private project. Each token that you keep for your private project is transferred 1:1 into earning points. The amount that each group project adds to your earnings depends on how many tokens you and the two other group members allocate to this specific project. This is because each group project produces earnings according to the total number of tokens that were allocated by the members. This sum is multiplied by 1.8 and equally divided among the 3 group members as earning points for this round:

$$\text{Group project earnings of each member} = 1.8 \times [\text{Sum of allocated tokens}] / 3$$

This means your earnings will increase by 0.6 points for every token you or a group member allocates to the group project. These rules hold for all the four groups you are participating in.

After everybody has made their decision, the outcomes of the group projects will be calculated and you will be informed about the results for the current round. Your earnings from each round are composed in the following way:

$$\begin{array}{ccccccc} \text{Your} & & \text{Your} & & \text{Your} & & \text{Your} \\ \text{round} & & \text{private} & & \text{group} & & \text{group} \\ \text{earnings} & = & \text{project} & + & \text{project A} & + & \text{project B} \\ & & \text{earnings} & & \text{earnings} & & \text{earnings} \\ & & & & \text{Your} & & \text{Your} \\ & & & & \text{group} & & \text{group} \\ & & & + & \text{project C} & + & \text{project D} \\ & & & & \text{earnings} & & \text{earnings} \end{array}$$

After you have seen the results, click on [OK] and a new round will start. In the last round, clicking [OK] will take you to a screen that shows your total earnings.

Lastly, you will be asked to fill out a short survey while we are preparing your payment. This payment will be given to you in an envelope at your seat. You can collect your payment in private and then the session will be finished. While leaving the room, please return the envelope and these instructions at the exit.

Before we start with your assignment you will now be asked a few questions to ensure that you understood these instructions correctly.

B.8 Instructions Treatment G4-WL

Welcome!

Thank you for taking part in this study. Through your participation you can earn a considerable amount of money. Therefore, read the following instructions carefully.

Communicating with other participants during the session is not allowed. Should you have any questions, raise your hand and we will answer in private. Every participant will receive the same information and will read the same instructions.

Your Earnings

Your earnings will be calculated in **points**. At the end of the session these earning points will be converted into Euros at the following exchange rate:

$$80 \text{ points} = 1 \text{ Euro}$$

In addition, you will receive a show-up fee of 4 Euros for your participation. You will be paid in cash at the end of the session. No other participant will be able to know the payment you receive.

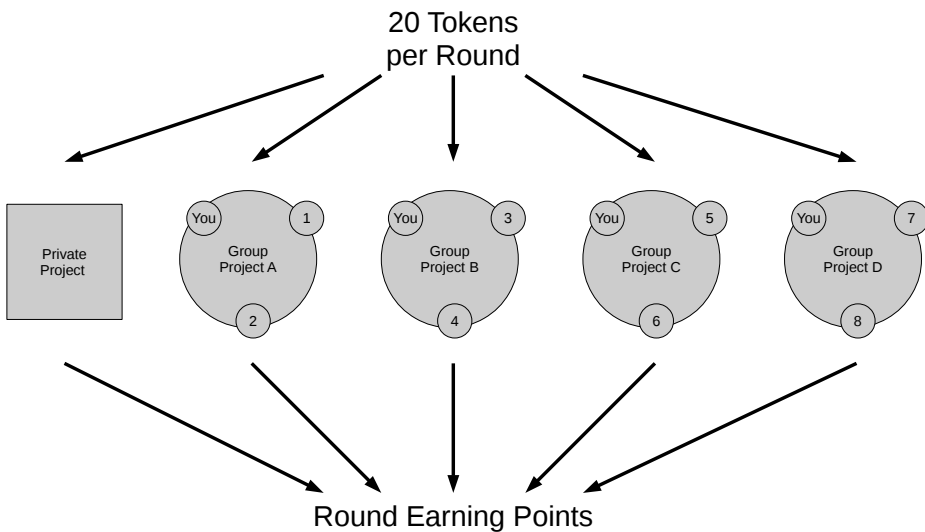
Your Assignment

Your assignment will last for 20 rounds. Each round you will receive **20 tokens**. Your task is it to divide these 20 tokens between five

different projects: **one private project** and **four group projects**. The group projects are called A, B, C, and D. The purpose of all five projects is to add points to your earnings each round.

Each of the four group projects has **3 members** (including you). This means you will interact with 8 other participants in total (2 other participants \times 4 different groups). These 8 participants are **different persons**. Therefore, you will not meet anyone in more than one group. The groups will remain the same for the whole assignment. This means you will interact with the same 8 other participants for all 20 rounds. You can identify them by a number between 1 and 8. However, this numbering is random and does not relate to the numbers on the desks.

The figure below illustrates your decision between the private project and the four group projects:



To divide the 20 tokens, you can allocate any whole number between 0 and 20 to each of the group projects. You cannot allocate more than 20 tokens in total. The tokens that you do not allocate to any of the group projects will automatically be allocated to your private project.

The group projects add differently to your round earnings than your private project. Each token that you keep for your private project is transferred into 0.5 earning points. The amount that each group project adds to your earnings depends on how many tokens you and the two other group members allocate to this specific project. This is because each group project produces earnings according to the smallest number of tokens that were allocated by a member. This number is multiplied by 1.8 to determine the earning points that each group member receives for this round:

$$\text{Group project earnings of each member} = 1.8 \times [\text{smallest number of tokens allocated}]$$

These rules hold for all the four groups you are participating in.

After everybody has made their decision, the outcomes of the group projects will be calculated and you will be informed about the results for the current round. Your earnings from each round are composed in the following way:

$$\begin{array}{rcccc} \text{Your} & & \text{Your} & & \text{Your} & & \text{Your} \\ \text{round} & = & \text{private} & + & \text{group} & + & \text{group} \\ \text{earnings} & & \text{project} & & \text{project A} & & \text{project B} \\ & & \text{earnings} & & \text{earnings} & & \text{earnings} \\ & & & & \text{Your} & & \text{Your} \\ & & & & \text{group} & & \text{group} \\ & & & + & \text{project C} & + & \text{project D} \\ & & & & \text{earnings} & & \text{earnings} \end{array}$$

After you have seen the results, click on [OK] and a new round will start. In the last round, clicking [OK] will take you to a screen that shows your total earnings.

Lastly, you will be asked to fill out a short survey while we are preparing your payment. This payment will be given to you in an envelope at your seat. You can collect your payment in private and then the session will be finished. While leaving the room, please return the envelope and these instructions at the exit.

Before we start with your assignment you will now be asked a few questions to ensure that you understood these instructions correctly.

C | Appendix Conflict Resolution

C.1 Nash bargaining under unanimous sharing

Given the veto power of each party, it follows that the disagreement point is $\{d_a = 0, d_B = 0\}$ (outside options are zero). Let:

$$x_A \equiv z(a, b|US)F(a, b) \tag{C.1}$$

and

$$x_B \equiv (1 - z(a, b|US))F(a, b) \tag{C.2}$$

The Nash bargaining solution must satisfy

$$\max(x_A - d_A)(x_B - d_B) = \max x_A x_B \tag{C.3}$$

such that $F(a, b) = x_A + x_B$. It follows that $x_A = x_B = F(a, b)/2$ and hence:

$$z(a, b|US) = 0.5 \tag{C.4}$$

C.2 Individual maximization under unanimous sharing

Taking the two parties' individual payoff functions (4.4)+(4.5) and plugging in the unanimous sharing rule $z(a, b|N) = 0.5$ leads to:

$$\pi_A(a) = 0.5 \times F(a, b) - a \quad (\text{C.5})$$

$$\pi_B(b) = 0.5 \times F(a, b) - b \quad (\text{C.6})$$

Maximizing by taking partial derivatives with respect to a , b and let the derivatives be zero:

$$\frac{\partial \pi_A}{\partial a^{\text{US}}} = 0.5 \frac{\partial F}{\partial a^{\text{US}}} - 1 = 0 \quad (\text{C.7})$$

$$\frac{\partial \pi_B}{\partial b^{\text{US}}} = 0.5 \frac{\partial F}{\partial b^{\text{US}}} - 1 = 0 \quad (\text{C.8})$$

Solving for the marginal costs of investing:

$$0.5 \frac{\partial F}{\partial a^{\text{US}}} = 0.5 \frac{\partial F}{\partial b^{\text{US}}} = 1 \quad (\text{C.9})$$

C.3 Decision elasticity

Third party's decision function:

$$z(a, b|g = \text{TP}) = \frac{a^m}{a^m + b^m} \quad (\text{C.10})$$

Taking first partial derivative with respect to A's investment level:

$$\frac{\partial z}{\partial a} = \frac{ma^{m-1}b^m}{(a^m + b^m)^2} \quad (\text{C.11})$$

Elasticity of decision in point (a, z) :

$$\varepsilon_z = \frac{\partial z}{\partial a} \frac{a}{z} = \frac{ma^{m-1}b^m}{(a^m + b^m)^2} \frac{a}{z} \quad (\text{C.12})$$

Assuming equal investment $b = a$, which implies because of (4.13) $z = 0.5$:

$$\varepsilon_z = \frac{ma^{m-1}a^m}{(2a^m)^2} \frac{a}{0.5} = \frac{m}{2} \quad (\text{C.13})$$

C.4 Individual maximization under third party decision making

Taking the two parties' individual payoff functions (4.4)+(4.5) and plugging in the third party decision maker's sharing rule (4.14):

$$\pi_A(a) = \frac{a^m}{a^m + b^m} F(a, b) - a \quad (\text{C.14})$$

$$\pi_B(b) = \frac{b^m}{a^m + b^m} F(a, b) - b \quad (\text{C.15})$$

Maximizing by taking partial derivatives with respect to a , b and let the derivatives be zero:

$$\frac{\partial \pi_A}{\partial a} = \frac{(a^m + b^m)ma^{m-1} - a^m ma^{m-1}}{(a^m + b^m)^2} F(a, b) + \frac{a^m}{a^m + b^m} \frac{\partial F}{\partial a} - 1 = 0 \quad (\text{C.16})$$

$$\frac{\partial \pi_B}{\partial b} = \frac{(a^m + b^m)mb^{m-1} - b^m mb^{m-1}}{(a^m + b^m)^2} F(a, b) + \frac{b^m}{a^m + b^m} \frac{\partial F}{\partial b} - 1 = 0 \quad (\text{C.17})$$

Solving for the marginal costs of investing and simplifying:

$$\frac{ma^{m-1}b^m}{(a^m + b^m)^2}F(a, b) + \frac{a^m}{a^m + b^m} \frac{\partial F}{\partial a} = 1 \quad (\text{C.18})$$

$$\frac{ma^mb^{m-1}}{(a^m + b^m)^2}F(a, b) + \frac{b^m}{a^m + b^m} \frac{\partial F}{\partial b} = 1 \quad (\text{C.19})$$

C.5 Noise in third party's decision function

Taking third party's decision function with noise:

$$z(a, b) = \frac{a^m + \alpha}{a^m + b^m + 2\alpha} \quad (\text{C.20})$$

Plugging the noisy sharing rule into the two parties' individual payoff functions (4.4)+(4.5):

$$\pi_A(a) = \frac{a^m + \alpha}{a^m + b^m + 2\alpha}F(a, b) - a \quad (\text{C.21})$$

$$\pi_B(b) = \frac{b^m + \alpha}{a^m + b^m + 2\alpha}F(a, b) - b \quad (\text{C.22})$$

Taking partial derivatives with respect to a, b :

$$\frac{\partial \pi_A}{\partial a} = \frac{(a^m + b^m + 2\alpha)ma^{m-1} - (a^m + \alpha)ma^{m-1}}{(a^m + b^m + 2\alpha)^2}F(a, b) + \frac{a^m + \alpha}{a^m + b^m + 2\alpha} \frac{\partial F}{\partial a} - 1 \quad (\text{C.23})$$

$$\frac{\partial \pi_B}{\partial b} = \frac{(a^m + b^m + 2\alpha)mb^{m-1} - (b^m + \alpha)mb^{m-1}}{(a^m + b^m + 2\alpha)^2}F(a, b) + \frac{b^m + \alpha}{a^m + b^m + 2\alpha} \frac{\partial F}{\partial b} - 1 \quad (\text{C.24})$$

Simplifying:

$$\frac{\partial \pi_A}{\partial a} = \frac{(b^m + \alpha)ma^{m-1}}{(a^m + b^m + 2\alpha)^2}F(a, b) + \frac{a^m + \alpha}{a^m + b^m + 2\alpha} \frac{\partial F}{\partial a} - 1 \quad (\text{C.25})$$

$$\frac{\partial \pi_B}{\partial b} = \frac{(a^m + \alpha)mb^{m-1}}{(a^m + b^m + 2\alpha)^2}F(a, b) + \frac{b^m + \alpha}{a^m + b^m + 2\alpha} \frac{\partial F}{\partial b} - 1 \quad (\text{C.26})$$

Assuming party symmetry $b = a$ and finding maximum by $\frac{\partial \pi_A}{\partial a} = 0$:

$$\frac{(a^m + \alpha)ma^{m-1}}{(2a^m + 2\alpha)^2}F(a, b) + \frac{a^m + \alpha}{2a^m + 2\alpha} \frac{\partial F}{\partial a} - 1 = 0 \quad (\text{C.27})$$

Simplifying:

$$\frac{(a^m + \alpha)ma^{m-1}}{4(a^m + \alpha)^2}F(a, b) + \frac{a^m + \alpha}{2(a^m + \alpha)} \frac{\partial F}{\partial a} - 1 = 0 \quad (\text{C.28})$$

$$\frac{ma^{m-1}}{4(a^m + \alpha)}F(a, b) + \frac{1}{2} \frac{\partial F}{\partial a} - 1 = 0 \quad (\text{C.29})$$

Solving for marginal investment $\frac{\partial F}{\partial a}$:

$$\frac{\partial F}{\partial a} = 2 - \frac{m}{2} \frac{a^{m-1}}{a^m + \alpha} F(a, b) \quad (\text{C.30})$$

Plugging in marginal investment under unanimous sharing $2 = \frac{\partial F}{\partial a^{US}}$:

$$\frac{\partial F}{\partial a} = \frac{\partial F}{\partial a^{US}} - \frac{m}{2} \frac{a^{m-1}}{a^m + \alpha} F(a) \quad (\text{C.31})$$

C.6 Imperfect enforcement of third party's awards

Assuming that the share β of the surplus cannot be distributed by the third party because it cannot be enforced, implies that the factual third party awards $d_A \equiv (1 - \beta) \frac{a^m}{a^m + b^m} F(a, b)$ and $d_B \equiv (1 - \beta) \frac{b^m}{a^m + b^m} F(a, b)$. The Nash bargaining solution must satisfy $\max(x_A - d_A)(x_B - d_B)$ such that $F(a, b) = x_A + x_B$. It follows that $x_A = [\beta \frac{1}{2} + (1 - \beta) \frac{a^m}{a^m + b^m}] F(a, b)$ and $x_B = [\beta \frac{1}{2} + (1 - \beta) \frac{b^m}{a^m + b^m}] F(a, b)$ hence the sharing rule becomes:

$$z(a, b) = \beta \times 0.5 + (1 - \beta) \frac{a^m}{a^m + b^m} \quad (\text{C.32})$$

Plugging the imperfect sharing rule into the two parties' individual payoff functions (4.4)+(4.5):

$$\pi_A(a) = [\beta \times 0.5 + (1 - \beta) \frac{a^m}{a^m + b^m}] F(a, b) - a \quad (\text{C.33})$$

$$\pi_B(b) = [\beta \times 0.5 + (1 - \beta) \frac{a^m}{b^m + b^m}] F(a, b) - b \quad (\text{C.34})$$

Taking partial derivatives with respect to a, b :

$$\frac{\partial \pi_A}{\partial a} = \beta \frac{1}{2} \frac{\partial F}{\partial a} + (1 - \beta) \frac{(a^m + b^m) m a^{m-1} - a^m m a^{m-1}}{(a^m + b^m)^2} F(a, b) + (1 - \beta) \frac{a^m}{a^m + b^m} \frac{\partial F}{\partial a} - 1 \quad (\text{C.35})$$

$$\frac{\partial \pi_B}{\partial b} = \beta \frac{1}{2} \frac{\partial F}{\partial b} + (1 - \beta) \frac{(a^m + b^m) m b^{m-1} - b^m m b^{m-1}}{(a^m + b^m)^2} F(a, b) + (1 - \beta) \frac{b^m}{a^m + b^m} \frac{\partial F}{\partial b} - 1 \quad (\text{C.36})$$

Simplifying:

$$\frac{\partial \pi_A}{\partial a} = \beta \frac{1}{2} \frac{\partial F}{\partial a} + (1 - \beta) \frac{b^m m a^{m-1}}{(a^m + b^m)^2} F(a, b) + (1 - \beta) \frac{a^m}{a^m + b^m} \frac{\partial F}{\partial a} - 1 \quad (\text{C.37})$$

$$\frac{\partial \pi_B}{\partial b} = \beta \frac{1}{2} \frac{\partial F}{\partial b} + (1 - \beta) \frac{a^m m b^{m-1}}{(a^m + b^m)^2} F(a, b) + (1 - \beta) \frac{b^m}{a^m + b^m} \frac{\partial F}{\partial b} - 1 \quad (\text{C.38})$$

Assuming party symmetry $b = a$ and finding maximum by $\frac{\partial \pi_A}{\partial a} = 0$:

$$\beta \frac{1}{2} \frac{\partial F}{\partial a} + (1 - \beta) \frac{m}{4a} F(a, b) + (1 - \beta) \frac{1}{2} \frac{\partial F}{\partial a} = 1 \quad (\text{C.39})$$

Solving for marginal investment $\frac{\partial F}{\partial a}$ and plugging in marginal investment under unanimous sharing $2 = \frac{\partial F}{\partial a^N}$:

$$\frac{\partial F}{\partial a} = \frac{\partial F}{\partial a^{\text{US}}} - (1 - \beta) \frac{m}{2a} F(a) \quad (\text{C.40})$$

C.7 Lengthy third party proceedings

Taking the parties' profit functions that discount the future repayments.

$$\pi_A(a) = \delta^l \frac{a^m}{a^m + b^m} F(a, b) - a \quad (\text{C.41})$$

$$\pi_B(b) = \delta^l \frac{b^m}{a^m + b^m} F(a, b) - b \quad (\text{C.42})$$

Taking partial derivatives with respect to a , b :

$$\frac{\partial \pi_A}{\partial a} = \delta^l \frac{(a^m + b^m)ma^{m-1} - a^m ma^{m-1}}{(a^m + b^m)^2} F(a, b) + \delta^l \frac{a^m}{a^m + b^m} \frac{\partial F}{\partial a} - 1 \quad (\text{C.43})$$

$$\frac{\partial \pi_B}{\partial b} = \delta^l \frac{(a^m + b^m)mb^{m-1} - b^m mb^{m-1}}{(a^m + b^m)^2} F(a, b) + \delta^l \frac{b^m}{a^m + b^m} \frac{\partial F}{\partial b} - 1 \quad (\text{C.44})$$

Simplifying:

$$\frac{\partial \pi_A}{\partial a} = \delta^l \frac{ma^{m-1}b^m}{(a^m + b^m)^2} F(a, b) + \delta^l \frac{a^m}{a^m + b^m} \frac{\partial F}{\partial a} - 1 \quad (\text{C.45})$$

$$\frac{\partial \pi_B}{\partial b} = \delta^l \frac{ma^m b^{m-1}}{(a^m + b^m)^2} F(a, b) + \delta^l \frac{b^m}{a^m + b^m} \frac{\partial F}{\partial b} - 1 \quad (\text{C.46})$$

Assuming party symmetry $b = a$ and finding maximum by $\frac{\partial \pi_A}{\partial a} = 0$:

$$\delta^l \frac{ma^{m-1}a^m}{(2a^m)^2} F(a, b) + \delta^l \frac{a^m}{2a^m} \frac{\partial F}{\partial a} - 1 = 0 \quad (\text{C.47})$$

Simplifying:

$$\delta^l \frac{m}{4} F(a, b) + \delta^l \frac{1}{2} \frac{\partial F}{\partial a} = 1 \quad (\text{C.48})$$

Solving for marginal investment $\frac{\partial F}{\partial a}$:

$$\frac{\partial F}{\partial a} = \frac{1}{\delta^l} 2 - \frac{m}{2} F(a, b) \quad (\text{C.49})$$

Plugging in marginal investment under unanimous sharing $2 = \frac{\partial F}{\partial a^{US}}$:

$$\frac{\partial F}{\partial a} = \frac{1}{\delta^l} \frac{\partial F}{\partial a^{US}} - \frac{m}{2} F(a, b) \quad (\text{C.50})$$

Samenvatting

Samenwerking en conflict: Een rechtseconomische analyse van meta-organisaties

Gedurende de tweede helft van de twintigste eeuw heeft samenwerking tussen bedrijven als fenomeen aan populariteit gewonnen. Deze interbedrijfs-samenwerking neemt vaak de vorm aan van meta-organisaties: organisaties bestaande uit de samenwerkende organisaties. In dit proefschrift wordt een nieuwe rechtseconomische kijk op meta-organisaties geboden, waarbij meta-organisaties in termen van voordelen en verplichtingen worden afgezet tegen organisaties met werknemers. Doordat aspecten op het gebied van Rechtseconomie en Organisiëwetenschap worden geïntegreerd draagt het proefschrift bij aan het begrip van meta-organisaties en de wijze waarop ze worden bestuurd.

Meta-organisaties kunnen worden getypeerd als een hybride van markt en hiërarchie. Vanwege dit hybride karakter wijken meta-organisaties af van organisaties met werknemers. Dit verschil komt voort uit de onderscheidende ledensamenstelling en de hieraan gerelateerde beloningen en verplichtingen. De specifieke aard van de verplichtingen en beloningen in meta-organisaties bemoeilijkt de toepasbaarheid van gevestigde bestuursmechanismen voor organisaties met werknemers, zoals instrumenten die berusten op formele bevoegdheid en corporate governance. Als gevolg hiervan vragen meta-organisaties om specifieke bestuursmechanismen.

In dit proefschrift worden twee voorbeelden van dergelijke bestuursmechanismen gepresenteerd. Om te beginnen biedt het proefschrift een visie op besluitvorming door derden als een integraal onderdeel van de meta-organisatie, waaruit naar voren komt dat vormen van besluitvorming door derden, zoals arbitrage, in de context van meta-organisaties geen vervanging zijn van gewone rechtbanken maar eerder een aanvulling erop. Ten tweede wordt in het proefschrift stilgestaan bij de relevantie van groepsselectie bij samenwerking binnen meta-organisaties. Keuze uit een grotere pool van groepen met het oog op samenwerking kan dienen als een bestuursmechanisme waarmee coöperatief gedrag kan worden gestimuleerd, aangezien partijen hierdoor in staat worden gesteld zichzelf te ordenen op basis van hun bereidheid tot samenwerking. Een dergelijke keuze vormt echter tevens een belemmering voor samenwerking wanneer het zoeken naar een geschikte groep gepaard gaat met hoge coördinatiekosten.

In dit proefschrift wordt voortgebouwd op inzichten afkomstig uit de Rechtseconomie en de Organisiëwetenschap met als doel nieuw licht te werpen op het bestuur van meta-organisaties. De bevindingen in dit proefschrift op basis van een geïntegreerd gebruik van meerdere disciplines wijzen op de relevantie van een verbreding van het paradigma binnen de Rechtseconomie tot buiten de kaders van de neoklassieke economie.

Curriculum vitae

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Short bio	
<p>Maximilian holds a Master's degree in Economics and Finance from Pompeu Fabra University in Barcelona and a German Diplom in Computer Science from the Baden-Wuerttemberg Cooperative State University. He has previously worked as a data analyst for Commerzbank and as a technical consultant for Hewlett-Packard.</p> <p>In his research Maximilian studies the governance of meta-organizations, such as joint ventures and business networks. His methodological focus lies in the application of microeconomic theory, statistical data analysis and experimental economics. In 2015 Maximilian was awarded the Heinz Sauer mann young-researchers prize. Besides teaching and the supervision of Master's theses, he is also involved in drafting external expert reports.</p>	
Education	
Masters in Economics and Finance - Pompeu Fabra University (Barcelona Graduate School of Economics), Barcelona	2011 - 2012
Bachelor of Science in Economics - Philipps University, Marburg	2008 - 2011
Exchange term - University of Alberta, Canada	2010
Diplom in Applied Computer Science - Baden-Wuerttemberg Cooperative State University, Stuttgart	2005 - 2008
Work experience	
Lecturer – Erasmus University Rotterdam, School of Law	2015 - 2016
Teaching Assistant – Rotterdam School of Management	2013 – 2014
Data Analyst - Commerzbank AG	2010 – 2011
Student Apprentice (Consulting and Integration) - Hewlett-Packard	2005 – 2009
Prizes and awards	
Heinz Sauer mann young-researchers prize	2015
Best Student Feedback EDLE seminars	2014

EDLE PhD Portfolio

Name PhD student : Maximilian Kerk
 PhD-period : 2012
 Promoters : Prof.dr. K. Heine
 Prof.dr. M. Casari

PhD training

<i>Bologna courses</i>		<i>year</i>
Introduction to the Italian legal system		2012
European securities and company law		2012
European competition law and intellectual property rights		2012
Game theory and the law		2012
Economic analysis of law		2012
Experimental and behavioural law and economics		2012
<i>Specific courses</i>		<i>year</i>
Seminar 'How to write a PhD'		2012
Hamburg summer school in law and economics		2013
Academic Writing Skills for PhD students (Rotterdam)		2013
Seminar Series 'Empirical Legal Studies'		2014
<i>Seminars and workshops</i>		<i>year</i>
Bologna November seminar (attendance)		2012
Workshop on Normative Multi- Agent Systems		2013
BACT seminar series (attendance)		2013-2016
EGSL lunch seminars (attendance)		2013-2015
Joint Seminar 'The Future of Law and Economics' (attendance)		2014
Rotterdam Fall seminar series (peer feedback)		2013
Rotterdam Winter seminar series (peer feedback)		2014
EMLE MTM (co-presenter and peer discussant)		2015
Experiments at the Crossroads of Law and Economics		2014-2016
<i>Presentations</i>		<i>year</i>
Bologna March seminar		2013
Hamburg June seminar		2013
Rotterdam Fall seminar series		2013
Rotterdam Winter seminar series		2014
University of Siegen		2014
Bologna November seminar		2014
Joint Seminar 'The Future of Law and Economics'		2015

Max Planck Institute Bonn	2015
Birmingham PhD Decision Making Workshop	2015
Experiments at the Crossroads of Law and Economics	2015
<i>Attendance (international) conferences</i>	<i>year</i>
Spanish Association of Law and Economics	2014
German Association of Law and Economics	2014
European Association of Law and Economics	2015
<i>Teaching</i>	<i>year</i>
Microeconomics and Markets (B.Sc. course)	2013 – 2014
Research & Writing Skills - Law and Economics (LL.M. course)	2015
<i>Others</i>	<i>year</i>
Supervision of Master's theses	2016
Co-author of an expert report	2016
Conducting laboratory experiments	2015 - 2016