

Cranfield University

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A dynamic view of network structure and governance mechanisms:

The case of a coffee sector sustainable sourcing network

School of Management

DBA Thesis

Supervisor: Prof. Richard Wilding
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TABLE OF CONTENTS

1	Linking document	10
1.1	Abstract	10
1.2	Introduction	11
1.2.1	Why this research?	11
1.2.2	Research setting	12
1.3	Networks and Inter-Organizational Relationships	13
1.3.1	What is a network?.....	13
1.3.2	Network as a perspective and Social Network Analysis	15
1.3.3	Network approaches used in this thesis.....	16
1.4	Research approach and research questions	18
1.5	Research evolution and relationship across projects.....	18
1.6	Methodology overview	24
1.6.1	Research objective and philosophical stance	24
1.6.2	Methodology approach overview.....	25
1.6.3	Case Selection overview	26
1.6.4	Data collection overview	27
1.6.5	Data analysis overview	27
1.7	Literature overview	29
1.8	Research findings overview.....	38
1.8.1	Research context	38
1.8.2	Network context, initial structure and conditions.....	42
1.8.3	Network evolution.....	44
1.8.4	Network governance and power opportunities	46
1.8.5	Summary findings overview	47
1.9	Discussion.....	49
1.9.1	Introduction.....	49
1.9.2	Implications for theory	49
1.9.3	Implications for practice.....	55
1.10	Limitations of the Study	59
1.11	Conclusion	60
1.12	Epilogue – Nespresso’s Programme after 2007	65
1.13	Future research directions	66
2	Project 1: Systematic Literature Review – Network and governance dynamics.....	68
2.1	Abstract	68
2.2	Introduction	69
2.3	Definitions and common typologies	70
2.3.1	What is a network?.....	71
2.3.2	What are governance mechanisms?	72
2.4	An initial research model	72

2.5	Systematic Review: Rationale, Search Strategy and Data Extraction.....	74
2.5.1	Why a Systematic Review?.....	74
2.5.2	The Review Process.....	75
2.6	Descriptive Analysis.....	85
2.6.1	Types of studies included.....	85
2.6.2	Types of journals.....	86
2.6.3	Studies over time.....	87
2.6.4	Studies by country.....	88
2.6.5	Studies by topic.....	89
2.7	Thematic Analysis.....	89
2.7.1	Introduction.....	89
2.7.2	Network creation.....	89
2.7.3	Motivations to form networks.....	90
2.7.4	Context factors.....	93
2.7.5	Network creation process.....	97
2.7.6	Initial network conditions.....	100
2.7.7	Initial Governance mechanisms.....	102
2.7.8	Network evolution.....	109
2.7.9	Evolution of governance mechanisms.....	114
2.8	Synthesis.....	122
2.8.1	How and why are networks created?.....	122
2.8.2	How are initial governance mechanisms defined?.....	124
2.8.3	How and why do governance mechanisms evolve over time?.....	125
2.8.4	Revised research model.....	126
2.8.5	Summary of research questions and findings.....	128
2.8.6	Limitations.....	132
2.8.7	Future research opportunities.....	133
2.9	Conclusion.....	134
2.9.1	Contribution to research.....	135
2.9.2	Contribution to practice.....	135
3	Project 2: Network governance dynamics.....	137
3.1	Abstract.....	137
3.2	Introduction.....	138
3.3	Theoretical background.....	139
3.3.1	Identifying a gap: Uncertainty and governance dynamics.....	146
3.4	Methodology.....	147
3.4.1	Research methodology.....	147
3.4.2	Unit of analysis.....	149
3.4.3	Data Collection.....	150
3.4.4	Data Analysis.....	153
3.5	Research Setting:.....	160
3.5.1	Nestlé Nespresso.....	160
3.5.2	The Coffee industry.....	161
3.5.3	Nespresso’s AAA Sustainable Quality™ Programme.....	161

3.6	Research findings	165
3.6.1	Initial context.....	165
3.6.2	Initial negotiation and conditions.....	169
3.6.3	Initial governance mechanisms	171
3.6.4	Context evolution	172
3.6.5	Evolution of conditions.....	175
3.6.6	Evolution of Governance Mechanisms	177
3.7	Conclusions	180
3.8	Managerial implications.....	182
3.9	Summary of research questions, findings and propositions	183
3.10	Limitations and future avenues of research.....	184
4	Project 3 – Network structure dynamics and multiplex relationships.....	185
4.1	Abstract.....	185
4.2	Introduction	186
4.3	Theoretical background	187
4.3.1	The networks as a unit of analysis.....	187
4.3.2	Network dynamics – Nature of change	188
4.3.3	Network dynamics - Drivers of change.....	193
4.4	Methodology.....	198
4.4.1	Research methodology.....	198
4.4.2	Case selection.....	198
4.4.3	Data sources	199
4.4.4	Data collection.....	199
4.4.5	Data analysis.....	201
4.4.6	Preparation of the network data.....	202
4.4.7	Data analysis.....	206
4.5	Research setting – Nespresso’s AAA Sustainable Quality Programme	208
4.5.1	Nestlé Nespresso.....	208
4.5.2	The Coffee industry	209
4.5.3	Nespresso’s AAA Sustainable Quality™ Programme.....	209
4.6	Research findings	211
4.6.1	Nespresso AAA Sustainability Network	211
4.6.2	Structural holes: Brokerage opportunities and constraints.....	217
4.6.3	Multiplex relations – Commercial and Personal Networks	219
4.6.4	Commercial Network.....	219
4.6.5	Personal Relationships Network.....	223
4.6.6	Multiplex relations.....	227
4.6.7	Affiliation networks	231
4.7	Discussion - Propositions emerging from the research.....	234
4.7.1	Network creation: The role of embeddedness.....	234
4.7.2	Network expansion and complexity	236
4.7.3	Managerial action.....	237
4.7.4	Positional power and multiplex networks	238
4.8	Managerial implications.....	240

4.9	Conclusion	240
4.10	Summary of research questions, findings and propositions	242
4.11	Limitations.....	243
4.12	Opportunities for further research	244
5	References	246
6	Appendices: Additional research data	268
6.1	Definitions used in this research	268
6.2	Appendix: Network typologies	270
6.3	Literature overview (from author’s Scoping Study, December 2007).....	273
6.4	Systematic Literature review: Articles included in the review	274
6.4.1	Articles included in the review from keyword search (N=104)	274
6.4.2	Additional references used: Background research or specific topics	278
6.5	Systematic Literature Review: Data extraction form sample	285
6.6	Appendix: Project 2 – Interview informants	290
6.7	Appendix: Project 2 - Interview Protocol	291
6.7.1	Interview guideline	291
6.7.2	Interview chart - Timeline.....	292
6.7.3	Interview chart – Enhancers and Inhibitors.....	292
6.7.4	Farm questionnaire	294
6.8	Appendix: Project 2 - Coding.....	296
6.8.1	Additional information on coding process	296
6.8.2	Coding by coder	298
6.8.3	Sources coded.....	299
6.8.4	Appendix: Nodes by sources – Example	301
6.8.5	Appendix: NVivo coded summary sheet in excel - Example	303
6.9	Appendix: Project 3 - Additional data sources	311
6.9.1	Project 3: Industry websites accessed	311
6.10	Project 3 - Network matrices	312
6.10.1	Sustainability, Commercial and Personal Networks	312
6.10.2	Actor attributes and affiliation matrices:	318
6.10.3	Sustainability Network Centralization measures.....	319
6.10.4	Cliques found in the networks.....	320
6.10.5	Ego-nets and brokerage opportunities.....	327
7	Scoping Study.....	329
8	Appendix: Publications accepted or published by January 1 st , 2010	330

LIST OF FIGURES

Figure 1-1: Relationship among research questions.....	19
Figure 1-2: Research overview.....	21
Figure 1-3: Model used to study network evolution	30
Figure 1-4: The three As in the Nespresso Programme	39
Figure 1-5: Compared network structure forms	43
Figure 1-6: Co-evolution of networks	54
Figure 1-7: Sustainability and strategy choices.....	56
Figure 2-1: Initial conceptual framework to study network evolution	73
Figure 2-2: Systematic Review Screening Process Overview	81
Figure 2-3: Articles by type of paper.....	86
Figure 2-4: Articles reviewed by publication date	88
Figure 2-5: Articles reviewed by geographic coverage	88
Figure 2-6: Nassimbeni's interdependencies and co-ordination mechanisms	106
Figure 2-7: Smith Ring and Van de Ven Process Framework	111
Figure 2-8: Lambert, Emmelhainz and Gardner Model.....	112
Figure 2-9: Doz's model of network evolution.....	113
Figure 2-10: Ariño and de la Torre's model of collaborative venture evolution	114
Figure 2-11: Proposed framework to study the creation and evolution of networks ..	127
Figure 3-1: Model of evolution of network relationships	146
Figure 3-2: Research questions and interview protocol	152
Figure 3-3: Coding by source - Interviews and documents.....	157
Figure 3-4: Tree-node coding - References coded	159
Figure 3-5: Nespresso's AAA Programme – Sustainability Network 2003-04	163
Figure 3-6: Nespresso's AAA Programme – Sustainability Network 2005	164
Figure 3-7: Nespresso's AAA Programme – Sustainability Network end of 2007	164
Figure 3-8: TASQ - Tool for Assessment of Sustainable Quality.....	176
Figure 3-9: Evolution of context and relational conditions.....	180
Figure 4-1: Koka, Madhavan and Prescott's model of network change	189
Figure 4-2: Choi and Krause (2006) - Impact of supply base complexity	192
Figure 4-3: Field research sources and references in Project 3	203
Figure 4-4: Nespresso AAA Sustainability Network evolution 2003-07	212
Figure 4-5: Commercial ties among participants in the AAA Sustainability Network ..	220
Figure 4-6: Personal ties among participants in the AAA Sustainability Network	224
Figure 4-7: Multiplex relationships in 2003	228
Figure 4-8: Multiplex relationships in 2007	229
Figure 4-9: Pearson correlations and P-Values for multiplex relationships over time.	231
Figure 4-10: Cross affiliations to sustainability programmes.....	232
Figure 4-11: Affiliation to major sustainability initiatives 2003-07	233
Figure 4-12: Co-evolution of networks	242
Figure 6-1: Types of network relationships.....	271
Figure 6-2: AAA Sustainability Network (R)	312
Figure 6-3: Commercial Network (C)	314
Figure 6-4: Personal Network (P).....	316

LIST OF TABLES

Table 1-1: Research linkages.....	22
Table 1-2: Literature summary	37
Table 1-3: Organizations involved in Nespresso's AAA Programme (Sustainability Network) between 2003 and 2007	41
Table 1-4: Summary of findings - Evolution of network variables	48
Table 1-5: Summary of research questions, findings and resulting propositions	61
Table 1-6: Summary of contributions to theory and practice.....	64
Table 2-1: Panel members consulted in the Systematic Review Process	75
Table 2-2: Related journals and influential authors research.....	77
Table 2-3: Search terms	78
Table 2-4: Search strings.....	79
Table 2-5: Database hits per search string.....	80
Table 2-6: Inclusion and exclusion criteria for document titles and abstracts	82
Table 2-7: Documents excluded after title and abstract review.....	83
Table 2-8: Selection criteria for full text papers	84
Table 2-9: Data extraction form.....	84
Table 2-10: Articles reviewed by source	86
Table 2-11: Articles reviewed by topic.....	89
Table 2-12: Overview of motivations to enter networks.....	93
Table 2-13: Harland et al.'s summary on networking activity	101
Table 2-14: Influencing factors on governance mechanisms.....	109
Table 2-15: Factors impacting the evolution in governance mechanisms.....	121
Table 2-16: Project questions and findings summary	128
Table 3-1: Factors impacting the evolution of governance mechanisms	144
Table 3-2: Semi-structured interviews by organization and geography	151
Table 3-3: Documents reviewed	153
Table 3-4: Coding variables - Category	154
Table 3-5: Coding variables - Chronological.....	156
Table 3-6: Emerging themes - Sample extract from spreadsheet.....	160
Table 3-7: Organizations involved in Nespresso's AAA Programme 2003-07	162
Table 3-8: Clusters participating in Nespresso's AAA Programme.....	163
Table 3-9: Summary: Initial context.....	168
Table 3-10: Summary - Negotiation and initial conditions	170
Table 3-11: Summary - Initial governance mechanisms	172
Table 3-12: Summary - Context evolution	173
Table 3-13: Summary - Negotiation and conditions evolution	177
Table 3-14: Summary - Governance mechanisms evolution	179
Table 3-15: Summary of research questions, findings and propositions.....	183
Table 4-1: Semi-structured interviews by organization and location	200
Table 4-2: Documents analyzed as part of the research.....	201
Table 4-3: Organizations participating in Nespresso's AAA Programme 2003-07	210
Table 4-4: Clusters participating in Nespresso's AAA Programme.....	211

Table 4-5: Whole network structure analysis 2002-07 – AAA Sustainability Network	215
Table 4-6: Cliques of 3 or more nodes in the AAA Sustainability Network.....	216
Table 4-7: Centralization of the AAA Sustainability Network	217
Table 4-8 - AAA Sustainability Network Ego Nets	218
Table 4-9 - Structure characteristics of the Commercial Network.....	221
Table 4-10 - Cliques of 3 or more nodes present in the Commercial Network.....	222
Table 4-11: Centrality of the Commercial Network	222
Table 4-12 - Structure characteristics of the Personal Network.....	226
Table 4-13 - Cliques of 3 or more nodes present in the Personal Network.....	226
Table 4-14: Centrality in the Personal Network.....	227
Table 4-15: Summary of research questions, findings and propositions.....	242

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1 Linking document

1.1 Abstract

In the context of sustainable supply networks, this research analyzes the evolution of governance mechanisms and network structure, including the interplay between network conditions, context factors, positional power and managerial actions. The study reports on a longitudinal empirical research on a multi-stakeholder sustainable sourcing network established by Nespresso, Nestlé's specialty coffee subsidiary.

The research analyzes both dyadic and multi-actor network dynamics and proposes a framework to study network evolution. Social network analysis techniques are also used to measure evolution of the network's structure and complexity as well as positional power opportunities.

The research shows that in the initial start-up phase, in a context marked by uncertainty, pre-existing commercial and personal relationships were favoured in the choice of partners. These pre-existing relationships were also influential in defining the initial network structure and supporting an initial phase of exploration. Governance mechanisms initially relied mostly on informal mechanisms, while formal mechanisms were incorporated over time to enable the supply chain network to grow and to provide clarity to all actors. As the sustainability programme network expanded in size and complexity, Nespresso, the lead organization, also acted on the network's structure by introducing regional offices, thus increasing network centralization and reducing complexity. Power derived by actors occupying central or brokerage positions in multiplex networks also influenced power relationships in the sustainability network by moderating or expanding the power opportunities available to central actors.

The research has implications for both the Inter-organizational Relationship and the Social Network Theory literatures. In contrast with prior literature, the research proposes that in conditions of uncertainty, the use of informal governance mechanisms can facilitate a search and experimentation process. Formalization of governance mechanisms can be used, not as a repair mechanism, but rather as an enabler for further growth and efficiency. The research also extends the concept of network complexity and proposes that network managers can reduce this complexity by introducing or managing nodes that in turn contribute to the re-centralization of relationships towards specific nodes. Lastly, the research has implications for managers and proposes mapping of existing commercial and personal relationships as a potentially valuable tool in the creation and management of networks, adapting coordination mechanisms to the objectives of the relationship and actively managing the network's structure as a mechanism to enable network growth and efficiency.

Keywords: Supply chain, Collaboration, Sustainability, Network Evolution, Network Structure, Governance Mechanisms, Inter-organizational Relations

The art of progress is to preserve order amid change and to preserve change amid order.

Alfred North Whitehead

1.2 Introduction

1.2.1 Why this research?

Sustainable supply chains, that is, the ‘management of raw materials and services from suppliers to manufacturer/service provider to customer and back with improvement of the social and environmental impacts explicitly considered’ (New Zealand Business Council for Sustainable Development, 2003) have received increased attention over the last decade as an opportunity to make a significant positive impact on supply chain practice (Auroi, 2003). Establishing alliances and networks in the Fair Trade market, one of the most widespread sustainable sourcing schemes, has been linked to bringing competitive and development benefits to the partners (Davies, 2009).

Collaborating with other organizations can, in any circumstance, be a difficult undertaking, with partners facing difficulties in areas such as differing meaning (Kumar and Anderson, 2000), fragility of trust (McEvily et al., 2003; Zaheer et al., 1998), lack of staff or leadership support (Waddock, 1988) and managing conflict (Gray, 1996). As expressed by Huxham and Vangen (2005):

Seeking collaborative advantage is a seriously resource-consuming activity so [it] is only to be considered when the stakes are really worth pursuing. Our message to practitioners and policy makers alike is don't do it unless you have to (Huxham and Vangen, 2005).

In sustainable supply chains, schemes such as Fair Trade require producer groups ‘to create and maintain strong external ties with corporate buyers, development NGOs and other organizations’ within their supply chain (Raynolds et al., 2004). But in a relatively new field such as this, corporations are considering a wide spectrum of options, from proactive postures involving future regulations and social trends to altering operations processes and products to prevent negative impacts (Aragon-Correa and Sharma, 2003).

Despite numerous references to their importance and a rise in the number of such networks (Arya and Salk, 2006; Overdevest, 2004), critics point to the limited attention that networks have received in the fair trade and sustainability literature to date (Davies, 2009). A large degree of uncertainty surrounds the creation and operation of these networks as scarce coverage exists of issues relating to the structure and governance of sustainable supply networks in ‘mainstream’ sectors (Davies, 2007; Raynolds, 2009; Dolan and Humphrey, 2000).

Even though there is still limited research on networks that incorporate sustainability considerations, the field can benefit from the significant academic interest in other types of inter-organizational networks that has resulted in a vast body of literature, with hundreds of articles in academic journals (Barringer and Harrison, 2000). Review articles like Oliver's (1990), Grandori and Soda's (1995) and Borgatti and Forster's (2003) integrate and summarize perspectives on the formation, operation and impact of inter-organizational networks.

Despite progress in the field, however, the literature has often been criticized for presenting mostly a static view of the relationship, offering little insight on the dynamics of collaboration (Barringer and Harrison, 2000; Doz, 1996; Parkhe et al., 2006; Salk, 2005; Reuer and Ariño, 2002; Ahuja et al., 2007) and for doing so from a dyadic rather than triadic or whole network perspective (Provan et al., 2007; Human and Provan, 2000).

An additional area of enquiry has been embeddedness of these collaborative agreements in a certain social, economic and institutional context and how this context influences (and is influenced by) their behaviour (Granovetter, 1985; Granovetter, 1992; Gulati, 1995a; Gulati, 1995b). Granovetter also points to the need of extending the embeddedness concept into empirical research and to study what happens in a dynamic process where 'you have to look at how people make use of their location in social networks to mobilize resources in order to achieve their economic goals' (Granovetter, 1990, p.14).

Consistent with the observations that 'managing the relationship over time is usually more important than crafting the initial formal design' (Doz and Hamel, 1998, p. XV), this research thus addresses these different but interconnected concepts from a dynamic perspective, in the context of a multi-stakeholder sustainable sourcing network.

1.2.2 Research setting

The study is centred on a single case longitudinal analysis of Nestlé Nespresso's 'Nespresso AAA Sustainable Quality™ Programme', which offers a unique opportunity to understand the creation and evolution of network structure and how it was governed over time. As one of the first such supply chains in the coffee world, it was developed under conditions of high environmental uncertainty. As the Programme was started about five years before the analysis was conducted, it also provides enough opportunities to review evolution of structure and governance conditions, offering an opportunity to enable in-depth examination of the dynamics present in a single and unique setting (Eisenhardt, 1989a; Yin, 1994). Because of the multiplex (commercial, personal and sustainability related) relationships, it also offers an opportunity to increase our understanding of embeddedness and its impact on network dynamics.

Nestlé Nespresso is an operating unit of Nestlé Group, one of the world's leading food, beverage, nutrition and wellness companies. The business is headquartered in Paudex, Switzerland, and focuses on premium single-portion coffee at the high-end of

the market, with a patented coffee-capsule technology, associated machinery and coffee capsules. In 2003 Nespresso launched the 'Nespresso AAA Sustainable Quality™ Programme'. According to the firm, the programme represented an 'effort to secure the highest quality coffee while promoting environmental, social and economic sustainability along the entire value chain, from the farmer to the consumer' (Nestlé Nespresso, 2008). For further information on the Programme, please refer to Section 1.8.1.

The case offered a good opportunity to analyze creation and evolution of a multi-stakeholder network over time. Personally, the choice of research topic also responds to the challenges I face in my daily work as a practicing consultant in two different 'worlds': that of supporting producers in developing countries as they enter global markets and that of working with large multinational corporations in their corporate strategies. Being part of emerging corporate and cross-sector programmes I am frequently challenged by the significant difficulties that still exist to establish successful cooperation among multiple actors with different motivations, expectations and operating models. Identifying possible elements and processes that enhance the possibilities of success and sharing this with the stakeholders involved was a strong motivation to pursue the research.

1.3 Networks and Inter-organizational Relationships

The concept of network has been used extensively in different fields and disciplines. As Nohria has pointed out, the 'indiscriminate proliferation of the network concept threatens to relegate it to the status of an evocative concept, applied so loosely that it ceases to mean anything' (1992, p.3).

To provide clarity in the review of this thesis, this Section introduces the definition of networks as used in this document, summarizes alternative approaches to the study of networks and then presents an overview of how these approaches were used in the research.

1.3.1 What is a network?

In a broad sense of the term, network is used to denote a set of units or nodes and a set of ties or relationships between these nodes (Mitchell, 1969). In management, terms such as collaboration, co-operation, alliances, inter-organizational relations and networks are used by different streams of literature to denote the sharing of certain resources and capabilities to achieve a joint outcome across organizations. Inter-organizational networks are a common area of research in management but networks can refer to intra-organization networks as well as to broader and less easily identifiable social networks. Networks can also refer to relationships between two units or dyads or to triads, groups or an entire population or 'network-as-a-whole'. Further, networks can be seen as an object of study or as a perspective in itself.

For purposes of this research, I refer to inter-organizational networks as relatively enduring relationships established between an organization and one or more organizations in its environment, involving the sharing of information, resources,

activities or capabilities (Ebers and Jarillo, 1997; Brass et al. 2004; Kilduff and Tsai, 2003). Besides studying networks as an object of study, the research incorporates networks as a perspective by using social network analysis tools to study network structure evolution in Project 3.

To clarify the multiple perspectives that inform the research, a distinction of different units of analysis and related terminology found in the literature is presented below, though for consistency purposes this thesis uses the term 'network' across the different projects.

Inter-organizational Relations (IOR)

Though the expression can be used to refer to dyadic relationships as well as to those involving a large number of organizations (Cropper et al., 2008), the term is generally used to analyze relationships between two organizations.

Transaction Cost Economics, Resource Based View and Institutional Theory (among others presented in Section 2.7.3, Table 2-12) have contributed significantly to the understanding of working relationships between organizations in business markets by addressing the motivations to enter these relationships, ownership structures and governance mechanisms. Inter-organizational Process Theory, or Inter-organizational Relationship Dynamics, also addresses the processes whereby these relationships are established, evolve and are dissolved. In addition to the pure exchange relationships, the interaction model known as Industrial Marketing and Purchasing (IMP) developed in the 1980s by a group of researchers includes relationship variables beyond isolated commercial transactions and refers to continuous exchange relationships that institutionalize and adapt and are immersed in an atmosphere described in terms of power-dependence, level of conflict/cooperation and mutual expectations (Håkansson 1982).

Inter-organizational relationships constitute a building block of larger types of relationships such as the chains and multi-actor network explored below. As the building block of broader structures, analysis at the dyadic level can inform analysis of multi-actor networks but has been criticized for failing to generate 'a more complete understanding of wider network changes' (Johnsen et al., 2008).

Inter-organizational Chains

Emerging mainly in the study of supply chains in the logistics literature (Christopher 1992; Cavinato, 1992) and value chains in the management (Porter, 1985) and economic development literature (Gereffi, 1994; Gereffi, Humphrey and Sturgeon, 2005), the concept is generally associated with the understanding and management of the set of vertical linkages or connected string of organizations.

Power and the ability to 'manage' the chain are generally associated with the end-customer position, though supply-driven chains have also been identified in the literature (Gereffi, 1994; Gereffi et al., 2005).

As noted by Johnsen et al. (2008): 'Supply Chain Management is based on the principle that supply relationships are but a part of a long chain of suppliers to end-

customers; total supply chain visibility supposedly reveals potential for cost reduction and value creation across several supplier tiers'. The authors, however, go on to limit the opportunities available for chain analysis due to its simplistic view of inter-organizational relationships and its focus on control management rather than a broader understanding of inter-organizational relationships.

Supply networks evolve from the supply chain view to refer to a set of supply chains involved in the production and supply of a particular product or product family (Harland, 1996; Johnsen et al. 2000) and incorporate links between, or across, individual supply chains, providing a more holistic picture of the system and process of supply (Harland, 1996). The study of complexity of supply networks also incorporates the concept of direct linkages between a customer and the first tier of suppliers (supply base), and distinguishes it from indirect relations with the entire supply network and other forces that determine its evolution (Choi et al., 2001, Choi and Krause, 2006).

Inter-organizational Networks

Inter-organizational networks analyze the web of interconnected relationships among multiple organizations. A differentiation from the previous two levels of analysis is that the term is generally employed to include a larger number of actors connected with each other.

Inter-organizational networks can be viewed from two approaches: 1) 'Networks as markets', where the concept is used to present organizations and markets interwoven through a set of relationships; and 2) 'Networks as organizations', which views the network as a whole entity, referring generally to an explicitly defined coalition of firms or organizations sharing a common objective. As Johnsen, Lamming and Harland (2008) put forward, this distinction is relevant as it implies a difference between the management *in* networks and the management *of* networks.

On the first view of networks, that of networks as markets, the IMP network model presents actors, activities and resources (ARA) as the core elements of a network where actors are defined by the activities they perform and resources they control and are connected to other actors via resources and activities (Håkansson and Snehota, 1995). In this perspective the focus lies on the implications that changes in one relationship has on other relationships elsewhere in the network and on the management *in* a network. The second view, networks as organisations, is frequently present in organization studies and public management literature and focus on the management *of* the network, in areas such as governance mechanisms of networks as a whole (e.g. Provan et al., 2007) as well as the management of the composition and structure of the network (Davis, 2008).

1.3.2 Network as a perspective and Social Network Analysis

Social network approach differs from other views in that it focuses on the study of relationships among organizations, rather than the examination of attributes of individual actors. Social network perspective sees actors as embedded within

networks of interconnected relationships that provide opportunities for, as well as constraints on behaviour (Kenis and Oerlemans, 2008; Borgatti and Foster, 2003).

The perspective is closely associated with social network analysis, an approach involving a precise set of terms, tools and methodologies to analyze relationships. As Wassermann and Faust present the term: 'Social network analysis provides a precise way to define important social concepts, a theoretical alternative to the assumption of independent social actors, and a framework for testing theories about structured social relationships. The methods of network analysis provide explicit formal statements and measures of social structure properties that might otherwise be defined only in metaphorical terms' (1994, p.17). Key components of social network analysis are: actors, ties, structural properties, and positional properties of actors.

Actors can be persons or teams or organization related to other actors through ties, also called linkages or relations and can be further categorized by its nature, strength, direction and mutuality. Networks can also be analyzed for dyads, triads, cliques and subgroups or for the network as a whole and can be viewed from a particular actor's perspective (egocentric networks) or from as an entire network. In analyzing the ties present in the network, the social network perspective provides metrics for demographics, system connectedness, level of centralization and other measures that describe the structural properties of a network. These metrics can then provide insights on possible behaviours of the network. For example, a highly centralized network can facilitate integration and coordination (Provan and Milward, 1995), while dense networks (a high proportion of all possible ties are actually present) can give an indication of the degree of cohesion of the network and provide insights on phenomena such as the speed at which information can travel across the network (Wasserman and Faust, 1994).

Positional properties of actors have received significant attention in the literature, as actors who are most important tend to be located in strategic locations within the network (Wasserman and Faust, 1994). Prominent positions can stem from centrality whereby a central actor is involved in many ties (Freeman, 1979). Actors can also derive control benefits from being situated between two other actors that would be otherwise not linked, thus spanning a 'structure hole' (Burt, 1992).

Embeddedness, where economic exchanges are embedded in social networks (Granovetter, 1985), is a central idea in the social network perspective. In this view, the characteristics of a network are influenced by the extended social network that actors belong to (Gulati, 1995a; Gulati and Gargulio, 1999; Hite and Hesterly, 2001) and the more experience that an organization has with another network partner, the more likely that a new relationship will develop among these organizations (Gulati, 1995a).

1.3.3 Network approaches used in this thesis

As stated at the beginning of this Section, this research uses the term inter-organizational network to refer to relationships between one organization and one *or more* organization(s), including in its definition both dyadic and multi-actor networks.

However, it relies on relatively separate, albeit complementary, areas of literature in Project 1 and 2 (Systematic Literature Review and Governance Dynamics) on one side and Project 3 (Structure Dynamics) on the other. This last project also incorporates Social Network Analysis as a methodology, complementing the predominantly qualitative analysis of data used in Project 2.

Inter-organizational Relationship Literature and Governance Dynamics

Project 2 focuses on network governance mechanisms, building on the extensive supply chain and management literature addressing governance mechanisms and relationship dynamics from a dyadic perspective.

Nespresso's AAA Programme was created and formally led by Nespresso. As the initiator and leader of the programme, Nespresso initiated all the formal and most of the informal mechanisms of coordination. Regarding the formal mechanisms, contracts, memoranda of understanding and agreements were established between the central actor Nespresso and each organization individually. Section 3.6.3 analyzes the differences between the Memorandum of Understanding signed between Nespresso and the NGO Rainforest Alliance and the initial agreements established with suppliers that participated in the initial stages of the programme. An exception to this is a four-way agreement signed by the development agency, the supplier, Nespresso and Nestle to implement specific areas of the programme in Central America. Nespresso also initiated Informal governance mechanisms, such as conference calls and Stakeholder and Expert meetings (see Section 3.6.3), though they involved a high level of direct informal interaction between all actors in the network.

Inter-organizational relationship literature, where a vast amount of research on governance mechanisms resides, and inter-organizational dynamics literature were explored in the literature search and became a basis for the analysis of field research data in Project 2, complemented by an overview of the Social Network approach included in the literature review (Section X) and Provan et al.'s (2007) view of governance of networks as a whole.

Inter-organizational Network literature and Structure Dynamics:

While Project 2 focuses implicitly, by the methods, used mostly on the network as the sum of dyads, Project 3 expands the literature review from Project 1 and 2 to incorporate a 'network as a whole approach'. The literature review addresses additional topics that refer to the network as a whole, including network change models (Koka et al., 2006), network complexity (Choi and Krause, 2006), positional power (Brass and Burkhardt, 1992; Burt, 1992; Freeman, 1979;) and implications of social embeddedness (Granovetter, 1990; Gulati 1996a).

As the focus of the project was to analyze the evolution of the structure of the network, it relied on social network analysis methodology to measure the evolution of this structure, its complexity and the positional power opportunities derived from the core network and from multiplex ties among the actors.

Overall, the literature reviews and the methodologies used in the two projects complement one another and, as a whole, allow to see the network from the dyad as well as from the network as a whole perspectives.

1.4 Research approach and research questions

Integrating a review of existing research, network structure analysis techniques and qualitative analysis of interactional dimensions, the research analyzes the evolution of network structure and governance mechanisms over time as a combination of purposeful strategy choices and the evolution of context conditions, including the effects of multiple associations among actors belonging to the network studied.

The questions driving the research are:

RQ1: How do context conditions influence the creation and evolution of networks?

RQ2: How and why do governance mechanisms evolve over time?

RQ3: How and why does network structure evolve over time?

1.5 Research evolution and relationship across projects

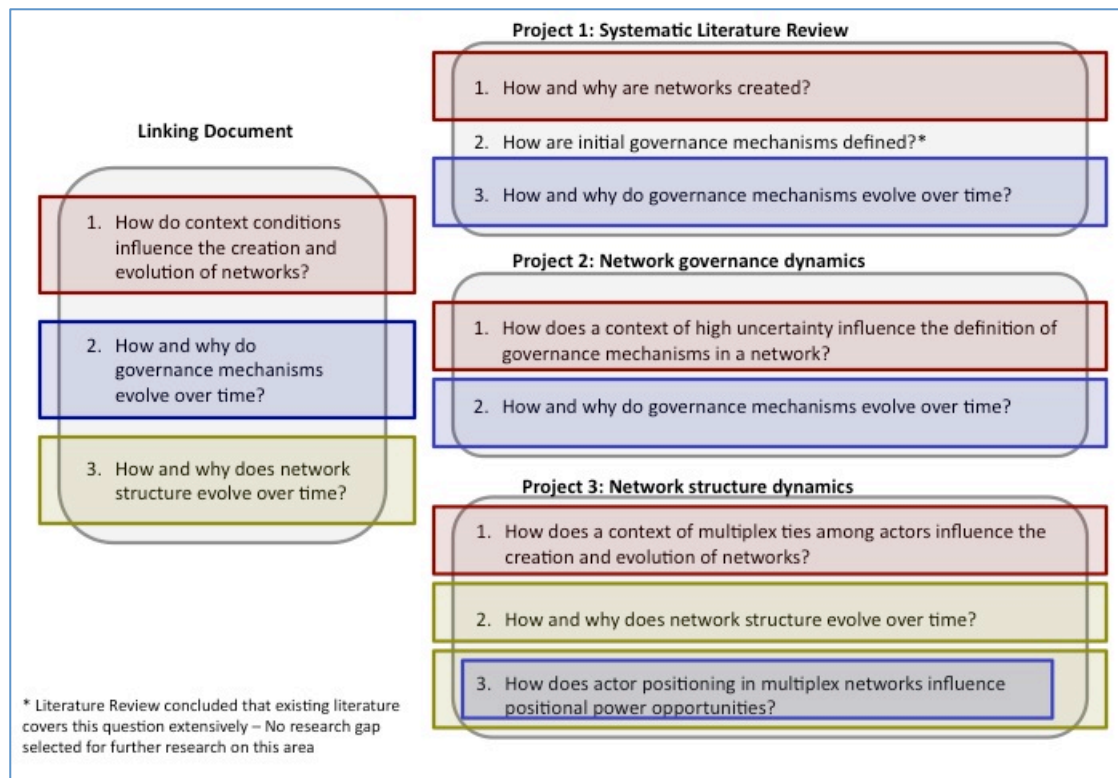
Unlike the traditional PhD programme, Cranfield's DBA programme follows, a modular structure with candidates completing three separate projects over the period of their doctorate, complemented later with a 'linking document' which integrates the findings of the various projects and framing the research more generally. As stated in the programme guidelines, 'as each project has been written up and presented to an academic panel at intervals of up to a year, there may be some repetition of the research issue, research question or literature in the projects, given that these were originally presented to a supervisory panel in a full written format at each project completion' (Cranfield University, 2008).

This thesis follows Cranfield's modular structure, with the three projects presented in the same format and with the same content as when they were individually finalized. This structure includes different and complementary perspectives in Project 2 and Project 3, but might also cause certain confusion due to the separate research questions, findings and conclusions presented in each project.

Also, a review of the literature is contained in all three projects. Project 1, the Systematic Literature Review, was carried out relatively early in the doctoral studies and is focused mainly on the research questions that served as a base for the field research and for Project 2. As Project 3 was designed afterwards, centring on multi-actor networks and social network theory, an additional literature review was carried out that complemented the one in Project 1.

To clarify the evolution of the research, Figure 1-1 provides an overview of the linkages among the research questions in the three projects and the linking document.

Figure 1-1: Relationship among research questions



Project 1 (Section 2 of this document) was designed as a systematic review of the literature, following up from previous literature research and refining the scope of the research. The review follows the methodology of ‘Systematic Literature Review’ proposed by Tranfield, Denyer and Smart (2003) and complements this highly structured process with additional background literature as well as specific literature that was later uncovered in the preparation of the field research. The research was undertaken using a descriptive framework on network evolution derived from the literature, which served as a guide on the topics to be explored by this initial research and which is presented in Section 1.7 of this document. This initial project resulted in a refinement of the descriptive framework as well as in identification of gaps or inconsistencies in the literature. Of the seven specific areas identified in the literature review as gaps in the theory, two broad topics, the role of context and embeddedness and the evolution of governance mechanisms, were undertaken as the focus for the ensuing two projects.

Project 2, presented in Section 3 of this document, used once again the descriptive framework to analyze the initial governance mechanisms present in a network and the evolution of these mechanisms over time. It then built on the findings of Project 1 and the data collected as part of the field project on Nespresso’s sustainable sourcing network. The data collected from the field project were analyzed with the use of a software tool, NVivo Version 8 (QSR International Pty Ltd, 2008), and the data were reviewed in search of an increased understanding of how and why governance mechanisms evolve over time. As a result of the analysis, a series of propositions were formulated regarding the influence of uncertainty, relationship embeddedness and relationship quality in the choice of initial governance mechanisms and their

evolution over time. A framework is proposed at the end of the chapter dedicated to this project (Section 3.7) integrating the findings of the research and proposing a relationship between the evolution of context and of relational conditions in a network.

Project 3, Section 4 of this document, also uses the descriptive framework developed as part of Project 1 and the data collected as part of the field research project on a sustainable sourcing network that were coded using the NVivo software. This project, however, looks at the structure of the network and its evolution over time. It applies a social network perspective and methodologies and tools that have been developed for the analysis of networks, the main ones being the software program Ucinet (Version 6.207) (Borgatti et al. 2002) and the accompanying graphical software Netdraw (Borgatti 2002). A series of propositions and a framework integrating strategic action, structure elements and multiplex embeddedness as drivers of network dynamics are presented at the end of the chapter.

The three projects are presented in the same format and with the same content as when they were individually finalized. They have not been modified to produce an integrated whole and might sometimes reflect somewhat different but complementary perspectives on different subjects. Also, as Projects 2 and 3 studied network dynamics from two different angles (governance dynamics and network structure, respectively) they were based at least partially on different bodies of literature and different methodologies were utilized, leading at times to somewhat different uses of terminology that have been properly noted when necessary and summarized in Appendix 6.1.

Figure 1-2 presents a graphic overview of the relationship among the questions driving each individual project, as well as the methodologies used and the major findings. The numbered annotations also refer to the linkages among the different projects over time and the evolution of the research questions, and are explored below, in Table 1-1.

Figure 1-2: Research overview

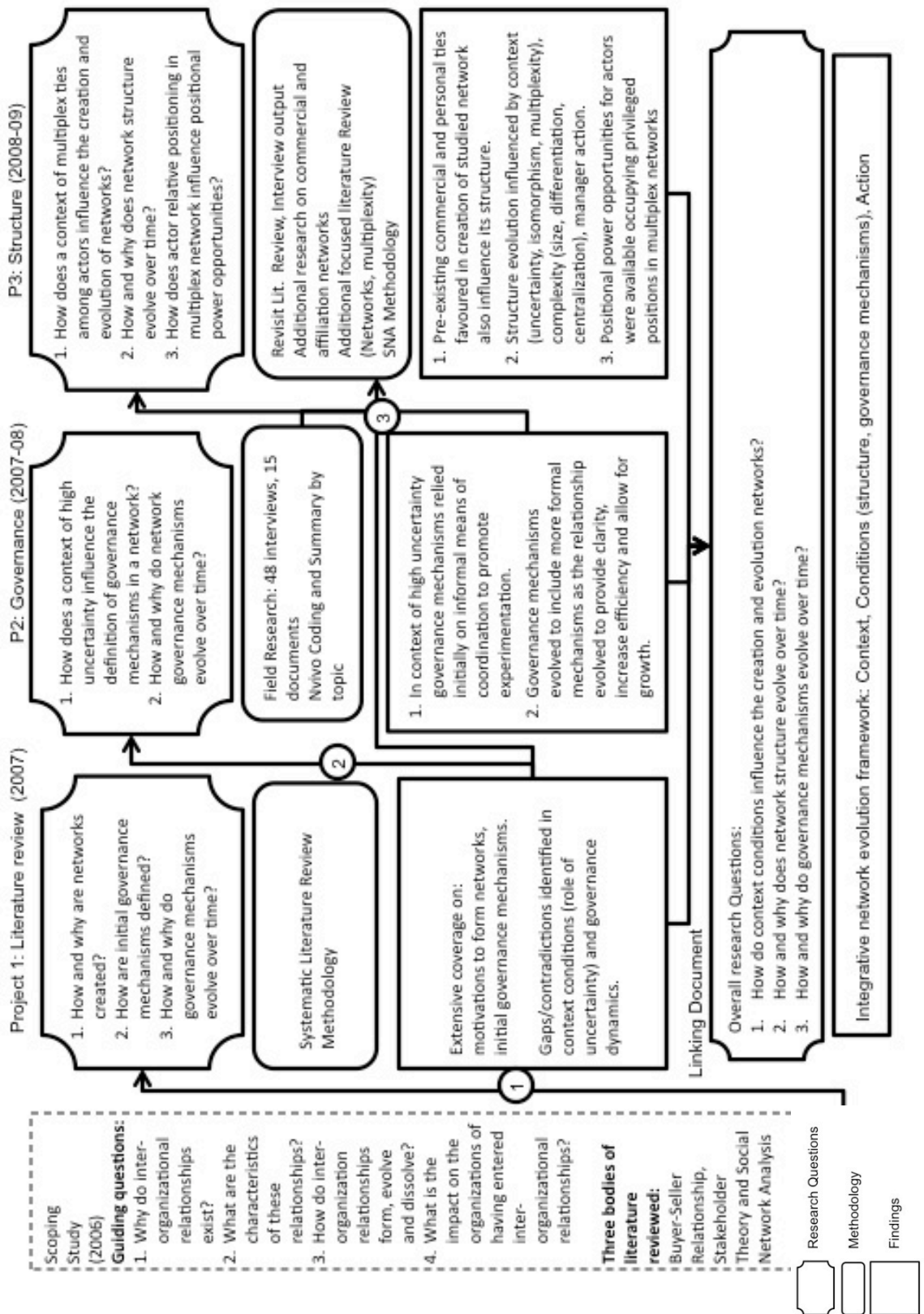


Table 1-1: Research linkages

	Linkage	Analysis of the outcome of the project	How it impacted future research
①	Initial scoping of DBA research	A Scoping Study (2006) (See Appendix 7) preceded the main research and took a very broad view of inter-organizational relationships and networks, with Research Questions spanning from creation to evolution to dissolution and impact of relationships. Multiple areas of literature were identified and three were reviewed at a high level.	Narrowed down significantly the scope of the research to focus mainly on creation and evolution of networks and governance mechanisms.
		Initial focus on social and environmental sustainability networks was considered too narrow to identify relevant literature that could inform the creation and evolution of sustainability networks.	Sustainability is considered as a particular context for network creation and evolution and the focus of the research was broadened to include all inter-organizational networks.
②	From Systematic Literature Review to Field Research and Project 2	The literature reviewed focused mostly on the study of dyadic relationships, with limited coverage of multi-actor networks.	Project 2's literature review relies heavily on the analysis of dyadic relationships and the possible extensions of this approach to multi-actor networks as the integration of dyads.
		Extensive coverage of motivations to form relationships found in the literature.	Project 2's focus on external context conditions (uncertainty) instead of the broader question about antecedents to network formation covered in Project 1. Embeddedness is identified as an additional context element but not explored further in this Project.
		Dynamic view of relationships and governance mechanisms identified as an area meriting further longitudinal research.	Field research and Project 2 based on longitudinal qualitative type research.
③	a) From Project 2 to Project 3	In addition to external context conditions, respondents cited the embedded relationships among actors (at personal and commercial level) as influencing the creation and evolution of the network's governance mechanisms, allowing for an increased use of informal mechanisms of coordination. The topic was not the focus of Project 3 but references to the issue had been coded and summarized as part of the qualitative analysis of the research.	As part of Project 3 analysis, a review of the coding sections that referred to other pre-existing types of ties among organizations was carried out (see Section 4.4.5). This was complemented by re-accessing two interviewees and retrieving publicly available information on commercial relationships and affiliations to other sustainability programmes.

	Linkage	Analysis of the outcome of the project	How it impacted future research
		References to the role played by multiple associations to sustainability programmes during the period analyzed were also made in the interviews.	
		A simple network diagram presenting linkages between network organizations was created to present the context of the relationship to Nespresso Stakeholder Forum in November 2007 (which included most of the interviewees). Interest arose from Nespresso managers and stakeholders represented in the meeting to better understand the structure of the network and its complexity. This was also brought up in two academic presentations that took place at the time.	Project 3 used Social Network Analysis to represent and analyze the structure of the network.
			Even though only two questions were used to define the interview protocol questions, additional information became available as these questions were broadly defined (ex. How did the programme evolve?). It also captured information beyond the role of the environment and governance mechanisms.
③	b) From Systematic Literature Review to Field Research and Project 2	The literature reviewed focused mostly on the study of dyadic relationships, with limited coverage of multi-actor networks.	Additional literature focused on network analysis and supply networks incorporated in Project 3.
		Embeddness identified as a context factor in the creation and evolution of relationships.	Project 3 focused on multiplexity as a specific form of embeddness.
④	From individual projects to Linking Document	Context conditions addressed in all 3 projects. In Project 1 as part of a broader precedent to network creation. Project 2 and 3 address specific factors: uncertainty and multiplex ties.	General question on context conditions.
		Project 2 and Project 3 focus on two different network conditions (structure and governance mechanisms)	Each of these conditions is addressed in one question.
		Project 2 addresses managerial action on governance mechanisms and Project 3 does the same for network structure.	Integrative network evolution framework addresses context, conditions and managerial action.

This Linking Document aims to synthesize the findings of the three projects against the general research issue of the dynamics of network structure and governance mechanisms and also represents an effort to integrate the overall contribution of the doctorate to both theory and management practice.

After this introduction, Section 1.6 describes the philosophic stance and the methodology approach. Section 1.7 then provides an overview of the academic literature. After that, Section 1.8 summarizes the integrated findings of Projects 2 and 3. Based on these findings and the literature review, Section 1.9 identifies implications for theory and for practice and presents an integrative model of the network. After identifying the major limitations and caution that needs to be applied to the conclusions in Section 1.10, the conclusions are summarized in Section 1.11, integrating the contributions to theory and practice and the broader implications that emerge from this research. The chapter ends with additional reflections on the implications of the case study and an additional commentary on the evolution of the network after the end of the study in Section 1.12. Together with the conclusions of the research, this leads to the proposition of further additional research avenues on this important topic in Section 1.13.

1.6 Methodology overview

1.6.1 Research objective and philosophical stance

An important step in helping the reader understand the researcher's position is to state the philosophical stance the research takes as explicitly as possible. Burrell and Morgan state that philosophical perspective is relevant because 'all social scientists approach their subject via explicit or implicit assumptions about the nature of the social world and the way in which it may be investigated' (Burrell and Morgan, 1979, p.1). Blaikie further cautions that social researchers 'can only collect data from some point of view, by making observations through spectacles with lenses that are shaped and coloured by the researcher's language, culture, discipline-based knowledge, past experiences and the expectations that follow from these' (Blaikie, 2000).

From an ontological perspective, this research adopts a critical realist position (Archer et al., 1998). Realism takes the view that there are different 'levels' of reality that can be systematically revealed through the rigorous application of the methods of science. Reality comprises things, structures, events and underlying 'generative mechanisms' which, regardless of whether they are observable or not, are nonetheless 'real' (Bhaskar, 1978). Theory therefore becomes the means for 'describing the relations between the unobservable causal mechanisms (or structures) and their (observable) effects' (Layder, 1990, p.13).

Related to this ontological position, the research follows a retroductive research strategy. Realist epistemology is based on the building of models of mechanisms such that, if they were to exist and act in the postulated way, they would account for the

phenomena being examined (Blaikie, 2000, p. 108). As Blaikie suggests, this is a strategy to discover appropriate structures and mechanisms to explain observable phenomena. Since structures and mechanisms will typically be unavailable to observation, it is necessary to first construct a model. The model is then tested as a hypothetical description of actually existing entities and their relationship. If these tests are successful, this gives good reason to believe in the existence of these structures and mechanisms, and the whole process of model building may then be repeated to explain structures and mechanisms later discovered (Blaikie, 2000, p.110).

1.6.2 Methodology approach overview

In line with the objective of the research and the research strategy, the selected methodology involved a Systematic Literature Review followed by an in-depth longitudinal Case Study using both quantitative and qualitative methods.

In Project 1, Systematic Review was chosen as a method to review the existing literature across the various literature areas that address topics related to networks. Indeed, research on networks has been characterized as extensive, fragmented and heterogeneous (Barringer and Harrison, 2000; Oliver, 1990), a situation that favours integration of literature in a structured process (Denyer and Tranfield, 2006).

The review of literature was based on the Systematic Literature Review methodology, as proposed by Denyer and Tranfield (Tranfield et al., 2003; Denyer and Tranfield, 2006). The method distinguishes itself from other types of literature review by adopting a 'replicable, scientific and transparent process that aims to minimize bias through exhaustive literature search of published and unpublished studies and by providing an audit trail of the reviewer's decisions, procedures and conclusions' (Cook et al., 1997 cited by Tranfield et al. 2003).

Originally based in the medical field and as a methodology to integrate findings from quantitative studies, this methodology offers the potential of comprehensiveness and comparability. It can, however, be challenging to apply it in the management field and especially in network literature, where a large number of qualitative studies represent a substantial component of existing research. When necessary, in order to accommodate for the heterogeneity in the methodologies of reviewed articles, integration of findings in the literature review includes elements of narrative analysis where 'narratives from individual studies are built into a mosaic or map' (Hammersley, 2001) and realist synthesis where the theories underpinning a study are identified and the findings of different studies are translated into terms that can allow comparison across them, but where underlying causation is reckoned to be contingent on specific circumstances (Pawson, 2001). It also incorporates, when appropriate, additional information on historic literature or information on a specific topic reviewed, introduced and appropriately noted to frame the issues identified by the search process.

Full details on the methodology adopted, the sources of data and the screening criteria can be found in Section 2.5, 'Systematic Review: Rationale, Search Strategy and Data Extraction'.

Projects 2 and 3 were based on an in-depth longitudinal case study focused on the multi-stakeholder network created by Nespresso as part of the Nespresso AAA Sustainable Quality Programme.

Because the number of multi-stakeholder sustainable sourcing schemes already in the execution stage is still very limited, each represents an 'extreme or unique' case rather than being representative of a broader phenomenon, in accordance with Yin (1994) who views this situation as a validation for the use of in-depth single case analysis. Single cases have also been found useful for 'illuminating and extending relationships and logic among constructs' (Eisenhardt and Graebner, 2007, p.25). Further, single cases are chosen because they are unusually revelatory, extreme exemplars, or opportunities for unusual research access (Yin, 1994).

Case study research was deemed appropriate to understand the issues underlying collaboration (Parkhe, 1993a), to 'help explain causal links in real-life interventions that are too complex for the survey or experimental strategies' (Yin, 1994) and to enable in-depth examination of the dynamics present in a single and unique setting (Eisenhardt, 1989a; Yin, 1994). The research adopts a longitudinal approach, proposed as appropriate to study and explore subjective meaning systems and social processes and to capture the complexities and dynamics of cooperation (Smith et al., 1995).

Data analysis included both qualitative and quantitative methods, following the 'bifocal' approach proposed by Coviello (2005) as a technique to capture change in both a network's structure and its interactions over time.

1.6.3 Case Selection overview

Nespresso AAA Programme was selected based on three considerations: 1) as sustainable sourcing initiatives in the coffee sector are a relatively recent phenomena, it provided an opportunity to observe creation and evolution patterns under conditions of context and process uncertainty, 2) as the programme was started about five years before the analysis was conducted, it provided sufficient opportunities to review evolution of conditions and governance conditions while at the same time affording the possibility to identify and interview relevant participants, thus offering an increased probability that records were kept and memory of key events was fresh enough; 3) access to key decision makers in all intervening organizations was facilitated, thus allowing a relatively rare opportunity in case research to interview all relevant stakeholders, from farmers on site, to partners, to Nespresso's past and present executives.

1.6.4 Data collection overview

Data were collected from multiple sources and multiple viewpoints within the network. In addition to contributing to the richness and variety of the data, this approach is also believed to help mitigate potential biases from informants in the unlikely event that varied informants would engage in convergent retrospective sense-making or impression management (Eisenhardt and Graebner, 2007).

Three major sources of evidence were used for this research: documents, archival records and interviews. These sources are among the six outlined by Yin (1994) as primary sources of evidence in qualitative research¹. A total of 48 semi-structured interviews were carried out with Nespresso executives and representatives of stakeholder organizations directly involved in the programme at any point between 2003 and 2007. After identifying the relevant stakeholder organizations involved, the principal criterion for determining the respondents within these organizations was their experience or knowledge of the programme at any time between 2003 and 2007, even if they were no longer part of the organization. An initial list of respondents was drawn up with the help of a consultant who had been involved in the programme since its inception. Snowball sampling was used to identify the most suitable respondents within each organization. Respondents were selected to represent different organizations, hierarchical levels, geographies and tenure. In addition to providing richer data, the approach has also been proposed as a way to mitigate the risk of convergent retrospective sense-making or impression management (Eisenhardt and Graebner, 2007).

Semi-structured interviews were conducted between June and September 2007. Each meeting lasted between 45 minutes and three hours, with the majority being 60 minutes long. Of the total number of interviews, 41 were face-to-face meetings in Switzerland, Costa Rica and Colombia, while 7 were done via telephone. An additional research data source consisted of relationship documents and archival information in the form of contracts, agreements, reports and press releases. In total, 15 documents were analyzed.

Additional information on the data collection process can be found in Section 3.4.3. The appendix in Section 6.6 contains a copy of the interview guideline.

1.6.5 Data analysis overview

As part of the analysis of the data used in Project 2 and Project 3, all interviews were taped, transcribed and analyzed. The interviews were originally done in Spanish, English and Portuguese and were transcribed in their original language.

The NVivo software tool was then used to analyze all transcripts and documents. The software has built-in tools for uploading documents, classifying, sorting and arranging

¹ The six data sources proposed by Yin (1994) as primary sources of evidence are: documents, archival records, interviews, direct observations, participant observations and physical artefacts.

information using, among other functionalities, tree nodes and sub-nodes (QSR International Pty Ltd, 2008). A first set of categories was then identified based on the interview guidelines and emerging themes. Two researchers (one of whom had not been involved in the interview phase) independently coded three representative interviews and two documents. This process sought to identify discrepancies in interpretation of the categories and to limit the extent of subjectivity that may exist in interpreting semi-structured interview data, as suggested by Johnsen et al. (2000). After a discussion, a final set of coding variables was agreed upon and the remaining interviews and documents were divided between the two researchers. The detailed methodology section in Project 2 provides additional background on the coding process and includes the final themes and chronological coding utilized (Section 3.4.4).

At the end of this phase, the entire database was again reviewed to identify any overlaps and to ensure the relevance of the references to the topic. It was then analyzed looking for patterns and indications to help build explanations for the unique situation and experiences (Yin, 1994). An additional matrix combining the chronological dimension and the themes emerging from the research was built using an excel spreadsheet transferring the data from the NVivo database, translating when necessary any Spanish or Portuguese quotes into English and disguising the names of organizations and individuals to preserve privacy and confidentiality. Appendix 6.8.5 presents one of the summary sheets built using an electronic spreadsheet.

For Project 3, in addition to the qualitative data analysis, social network analysis techniques were utilized to assess network structure characteristics. The software program Ucinet 6.207 (Borgatti et al. 2002) was used to construct matrices representing multiple relationships in the Nespresso-centric network, and the associated software program Netdraw (Borgatti 2002) was used to graphically represent these relationships. Sociomatrices were constructed to represent linkages among actors that participated in the Nespresso AAA Sustainable Quality Programme. In addition to the sustainable sourcing programme, socio-matrices were built to capture commercial and personal linkages among actors participating in Nespresso's AAA Programme. Dyadic interactions were thus represented in three groups of dichotomous matrices: R (AAA Programme Sustainability Network), C (Commercial Network) and P (Personal Network), each representing the existence or absence of relationships among the 37 organizations at six points in time, one for each period between 2002 and 2007. The relationships were all coded as non-directional and binary, representing the existence or not of a relationship but not the direction of the relationship or its magnitude. The resulting matrices are included in Appendix 6.10. Actor attributes and affiliation matrices (to the major sustainability initiatives in the industry at the time) were also recorded and are displayed in Appendix 6.10.2.

These matrices were then analyzed for a series of network constructs such as centrality, density or existence of cliques (Wasserman and Faust, 1994). Though the software package has been traditionally used for analysis of static networks, its functionality can easily be adapted to the study of network structure over time. Two

examples of such analysis are provided by a study of the evolution in knowledge-diffusion networks (Spencer, 2003) and research on the dynamics of entrepreneurial firms from start-up through growth (Coviello, 2005).

After each of the three networks had been examined independently, they were also analyzed together, seeking to identify overlaps or multiplexity relations (Minor, 1983) across the different networks. The Pearson correlation procedure (Hanneman and Riddle, 2005) was used to identify possible correlations between membership to one network and future membership to this or any of the other two networks.

Section 3.4.4 details the data analysis that was carried out as part of Project 3.

1.7 Literature overview

In an initial phase, existing research literature on sustainable supply chains and network relationships in this area was reviewed. However, as stated in the introduction to this chapter, despite the increasing number of cross-sector relationships established, this literature is still limited and 'networks have received only scant consideration in the fair trade literature to date' (Davies, 2009). Thus, the literature review was extended to also include the more extensive network and dyadic relationship literature found mainly in management and supply chain publications.

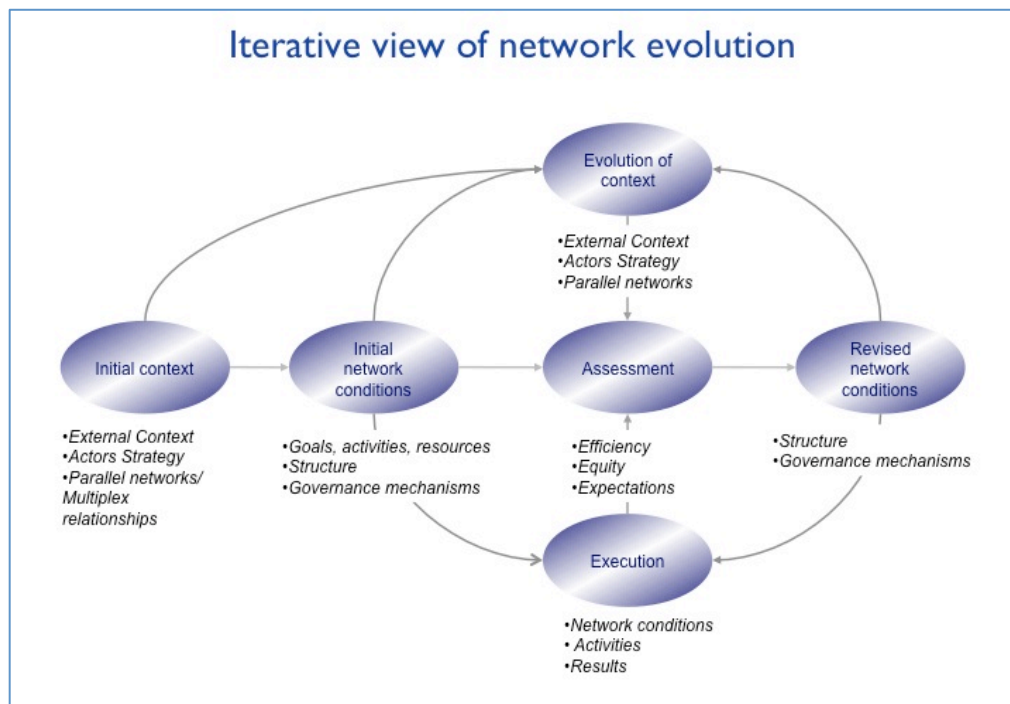
Initial conceptual framework

As part of the initial phase of the Study, a conceptual framework integrating elements involved in the creation and evolution of networks was developed on the basis of existing literature. The purpose of this descriptive model, reproduced in Figure 1-3, was to help identify variables that facilitate understanding of the external and internal dynamics impacting the structure and operation of such networks.

The framework incorporates concepts from various models present in the literature focusing on the dynamics of network relationship, mainly the evolutionary model of collaborative ventures of Ariño and de la Torre (1998), Doz's model of alliance evolution (1996), and Smith Ring and Van de Ven's model of cooperative inter-organizational relationships (1994). It also incorporates additional elements integrated by Harland et al. (2004) in a conceptual model for the study of supply networks such as the distinction between activity, resources and actors (Håkansson and Snehota, 1995) and formal governance and social coordination mechanisms (Grandori and Soda, 1995; Ellram and Edis, 1996; Nassimbeni, 1998; Ouchi, 1979). In this iterative view of the evolution of relationships, evolution in the external and internal contexts, results from the activities and eventually unilateral actions, as well as relationship factors, impact the assessment that the relationship participants have of the efficiency and equity of the relationship, as well as their views on the future potential of the relationship. This in turn leads to a new phase of re-negotiation and either continuation, revision or dissolution of the relationship.

The expanded literature research covered all aspects of network creation and evolution, as represented in Figure 1-3 but focused on the evolution of network structure and of governance mechanisms over time, where gaps or contradictions in the literature justified additional research. In particular, due to the special characteristics of sustainable sourcing networks, the role of embedded relationships and the co-existence of multiple types of relationships were analyzed seeking an increased understanding of their influence on the structure and governance mechanisms.

Figure 1-3: Model used to study network evolution



Network context and multiplex relationships:

While most of the early research on networks focused on the elements specific to the studied relationship in isolation of the surrounding environment, the context where these relationships take place has been receiving increasing attention since Granovetter (1985; 1992) focused on the notion of embeddedness. The concept relates to the degree to which an actor – an individual or an organization - is involved in a broader social, economic and institutional system and how this level of involvement influences (and is influenced by) its behaviour (Granovetter, 1985; Granovetter, 1992; Choi et al., 2001).

Context factors can then be external to the relationship, internal to each of the organizations, or relationship specific. External factors such as globalization and pace of technology change can influence the propensity to form networks (Christopher, 1992; Gulati and Gargiulo, 1999; Williamson, 1975) and the type of partners to be sought (Lamming et al., 2000). Internal context factors such as the motivations to form

relationships to reduce transaction costs (Williamson, 1975; Cavinato, 1992; Williamson, 1979), access resources (Das and Teng, 2000; Barney, 1991) or seek legitimacy (DiMaggio and Powell, 1983; Baum and Oliver, 1991) also lead to increased network formation and influence the nature of the network.

This research, however, focused on the third of the context dimensions mentioned, i.e. context factors linked to the embedded relationships among the organizations. At the firm level, research shows that repeated transactions or relationships among organizations lead to increased familiarity and trust, and this has been identified as a factor influencing the decision to enter new alliances or networks (Powell et al., 1996; Gulati, 1998; Gulati, 1999) and which companies are more like to create ties with each other (Gulati, 1995a; Gulati and Gargiulo, 1999). The effect of interpersonal ties at the network level, however, has been limited thus far and empirical research inconclusive (Olk and Earley, 2000).

Interpersonal relationships play a significant role in identifying the reason for creating the network as the person(s) discusses the original motive of the network within a social network (Gray, 1989), and this network will include individuals with whom the person shares a similar interest in the programme and with whom he or she has probably interacted in the past and trusts (Eisenhardt and Schoonhoven, 1996). Interpersonal relationships and increased trust can also be developed as the network develops. Ring and Van de Ven (1994) propose that individuals in boundary spanning roles will develop higher levels of interpersonal trust; Adobor (Adobor, 2006) also suggests that personal ties are beneficial in that they can form the basis for developing trust between partners and aid joint decision-making and information sharing, but they can also sometimes prevent dissolution of faltering arrangements as feelings may prevent the making of difficult, yet prudent, termination decisions. Taking the interpersonal trust concept further, McEvily, Perrone and Zaheer (2003) posit that trust can also be transferred when a third party connects two individuals, therefore closing a 'structural hole'² (Burt, 1992).

The relationship between interpersonal and inter-organizational trust, however, is not a clear one. Zaheer, McEvily and Perrone (1998) argue that interpersonal trust plays a subordinate role to inter-organizational trust in determining the cost of negotiation. Eisenhardt and Schoonhoven (1996) propose that the role of different types of relationships can vary over time. In their study in entrepreneurial contexts, relationships were found to follow a pre-determined evolution pattern whereby networks in the emergent stage of a firm will be comprised primarily of social embedded ties, shifting to encompass a balance of personal and arms-length relationships over time (Hite and Hesterly, 2001).

² In a 'structural hole' different parts of a network are disconnected but bridged by a few nodes that can then act as brokers among the parties (Burt, 1992).

Network structure, complexity and network evolution

Social Network Theory uses measures related to the connections among actors as well as to measurements applied to the network as a whole (Borgatti and Foster, 2003; Wasserman and Faust, 1994; Kenis and Oerlemans, 2008). By studying the size of the network, its composition and the relationships among its actors or nodes, the social network approach studies topics such as level of cohesion, centralization and existence of 'cliques' among sub-groups of actors within the network that can contribute to the understanding of issues such as integration and coordination (Provan and Milward, 1995). Another measure, density of a network, represents the proportion of all possible ties that are actually present. This measure can give an indication of the degree of cohesion of the network and provide insights on phenomena such as the speed at which information can travel across the network (Wasserman and Faust, 1994). Section 4.4 presents an overview of the key measures presented by the social network approach that were used in this research.

The nature of a network can evolve over time with changes in its composition and its level of complexity. Choi and Krause (2006) characterize the structure of a network by its level of complexity, measured in three dimensions: 1) size of the network, 2) degree of differentiation and 3) level of inter-relationships among suppliers. The greater the number of suppliers, the greater their variation and the greater their level of interaction, the more complex a network becomes. Choi and Krause (2006) then propose that a reduction in complexity may lead to lower transaction costs and increased supplier responsiveness but, in certain circumstances, it may also increase supply risk and reduce supplier innovation. For example, Hite and Hesterly (2001) find that, in entrepreneurial contexts, networks decrease in density and cohesion over time, making these networks more difficult to manage.

With regard to the forces driving structure change, the key drivers identified in the literature refer to changes in the participating organizations' strategies, institutional organizations, competitive environment and management intent for the relationships (Koza and Lewin, 1998). Ring and Van de Ven (1994) argue that conditions of the relationship are a result of sequences of execution, negotiation and commitment phases. Doz (1996) points to the importance of initial conditions in the evolution of network conditions, while Ariño and de la Torre (1998) cite environment changes as well as relationship quality as being an outcome and a mediating variable in the evolution of relationships.

Different views exist on the weight of environment factors on one side and purposeful managerial action on the other. On the one hand, an ecology perspective proposes that an organization adapts over time as a consequence of influential environmental factors rather than as a consequence of individual managerial choices (Hannan and Freeman, 1977). On the other hand, the architectural perspective focuses on the actions of alliance managers as network 'architects' and as being the major drivers of change in the network, even if this change occurs as a response to changes in

environment conditions (Ariño and de la Torre, 1998; Inkpen and Currall, 2004; Kogut, 1988; Hamel et al., 1989; Davis 2008).

In the complex adaptive systems view, the system emerges over time into a coherent form, and adapts and organizes itself without any singular entity deliberately managing or controlling it (Holland, 1995). Choi and Krause (2006), however, point to the capability of a focal firm in a supply network to actively manage the supply base, i.e. the suppliers that are actively managed by the focal firm, which represent a sub-group of the total supply network. Davis (2008) presents a concept of network 'plasticity' whereby networks can be 'pruned' and 'paired' purposefully to increase structural variety and supplement informal network processes. In this view, network managers can influence the number and type of ties in the network and use more redundant ties to ensure stability or promote a dynamic organization process by quickly reconstituting broken ties.

Network governance mechanisms

The second area of research relates to the selection of governance mechanisms, both initially and as the network evolves.

Coordinating and monitoring the activities of networks has been identified as an important aspect of networks that enhances the likelihood of achieving not only organization-level goals but also network-level objectives (Kenis and Provan, 2006). Network governance refers to the set of mechanisms that supports and sustains cooperation among participating organizations (Grandori and Soda, 1995) to enhance the likelihood of achieving network-level goals (Kenis and Provan, 2006; Provan and Kenis, 2008).

A common typology of governance mechanisms distinguishes between formal and informal coordination mechanisms. Formal mechanisms can take the form of control and reporting systems through which organizations structure their interaction in an explicit way, and can include command structures, incentive systems, standard operating procedures and documented dispute resolution procedures (Gulati and Singh, 1998; Dekker, 2004). Relationships, however, also encompass additional coordination mechanisms characterized by informal social systems rather than by bureaucratic structures (Jones et al., 1997; Powell, 1990) which presence can be identified in self-regulations such as norms (Heide and John, 1992; MacNeil, 1981; Dwyer and Oh, 1988), conventions or standards (Ponte and Gibbon, 2005), and in informal cultures and social bonds among managers (Wilson, 1995; Spekman et al., 1998b).

A dominant theme in management literature deals with identifying the appropriate governance mechanisms under specific factors and conditions. Formal mechanisms have been advocated in conditions of high asset specificity (Williamson, 1979; Williamson, 1985; Wilding and Humphries, 2006) as a safeguard against opportunistic behaviour (Anderson and Weitz, 1992; Bradach and Eccles, 1989) and to help prevent

involuntary sharing of knowledge across organizations (Kogut, 1988). Informal governance mechanisms have been found to have a moderating effect on the need for contractual mechanisms when social norms can deter a partner from behaving opportunistically for fear of potential sanctions related to reputation or exclusion (Gulati, 1998; Shapiro et al., 1992), or when increased trust and the expectation that the counterpart will behave in a reliable, predictable and fair manner exist among partners (Zaheer et al., 1998).

Uncertainty is frequently mentioned in the literature as a factor having a strong influence on governance mechanisms. But different theoretical perspectives have reached alternative and sometimes even contradictory conclusions on the role uncertainty plays. A dominant view present in Transaction Cost Economics (TCE) proposes that formal mechanisms of coordination increase control over sources of uncertainty (Williamson, 1991). More recently, authors in the TCE have distinguished between environmental uncertainty (lack of knowledge about states of nature and unpredictability of other economic actors' actions) and behavioural uncertainty (future behaviour of the relationship partner), where the classic TCE proposition will support behavioural uncertainty but be less effective as a mechanism to manage environmental uncertainty (David and Han, 2004; Coles and Hesterly, 1998). Yet another alternative view on environmental uncertainty is that of Real Options Theory, which stresses the importance of uncertainty and the discretion management has over managing it (Tong and Reuer, 2007) and where less hierarchical and contractual governance forms can provide flexibility to adapt upon the arrival of new information (Folta, 1998). Evidence on the relationship between uncertainty and governance mechanisms is inconclusive and has been called a 'theoretical and empirical puzzle', with theoretical positions that can contradict each other and non-conclusive empirical research (Koenig and Mellewigt, 2006).

Though the analysis of individual forms of governance is often found in the literature, it has also been observed that in reality the choice is not necessarily between one mechanism or the other, but rather a combination of mechanisms that will govern the interactions among the organizations (Krackhardt, 1990; Kadushin and Brimm, 1990).

Evolution of Governance Mechanisms

The literature on governance mechanisms has been frequently criticized for its mainly static view, implicitly assuming that governance mechanism choices take place only at the beginning of the relationship and ignoring evolution of these conditions over time (Reuer and Ariño, 2002; Ariño and de la Torre, 1998; Reuer et al., 2002; Das and Teng, 2002). There is, however, a growing interest in taking a dynamic view of relationships and uncovering the dynamic processes that underlie the development of relationships (Gulati 1998).

Among these, a dominant view of the evolution of networks points to the existence of either a virtuous or a vicious cycle that impacts the mix of governance mechanisms over time. In the virtuous cycle situation, positive trust reinforcement among actors

increases the likelihood that the relationship will tend to depend proportionately more on informal relative to formal governance mechanisms (Ring and Van de Ven, 1994; Inkpen and Currall, 2004; Heide and John, 1992). Successive collaborative relationships between organizations can reduce behavioural uncertainty and hence reduce the need for elaborate contracts (Ariño and Reuer, 2004; Ring et al., 2005) as these relationships have the opportunity to build up network trust and reputation, reducing the risk of opportunistic behaviour (Gulati, 1995a).

Norms play an increasing role over the life of a network relationship (Heide and John, 1992). Learning about the joint venture partner increases the likelihood that partners will reduce the emphasis on formal joint venture controls (Inkpen and Currall, 2004). Initial conditions can also play a role in creating a favourable environment. Reuer et al. (2002) propose that clear, unambiguous, collaborative objectives and performance guidelines established at the time of formation can support the development of network trust and thus lead to a lesser need to restructure governance mechanisms. Inkpen and Currall (2004) contradict this view by positing that more extensive use of formal controls and safeguards will slow down the development of trust in relationships and thus slow down the introduction of informal mechanisms of coordination.

In the vicious cycle scenario, internal or external sources of tension can arise and make the governance mechanisms inadequate. Supplemental agreements can be established to deal with misunderstandings, conflicts or external shocks (Ariño and de la Torre, 1998; Ring and Van de Ven, 1994). Uneven resource acquisition or learning among the actors can also impact the level of interdependency and bargaining power, leading to a renegotiation of the relationship and increasing the likelihood that formal controls will be emphasized by the 'out learned' organization (Das and Teng, 2002; Inkpen and Beamish, 1997). If these situations do not get resolved, a new instability occurs, which leads to a new round of re-negotiation and the introduction of new formal mechanisms or the dissolution of the relationship.

In both cases, however, the evolution towards more informal mechanisms is seen as a signal that the relationship is progressing and is viewed in a positive lens by the partners, while formal coordination mechanisms constitute safeguards and are intended to prevent opportunistic actions. An exception to this view proposes that formalization of governance mechanisms can actually be used as a means for the partners to make sense of the relationship and to lower uncertainty by focusing attention, provoking articulation and staging interaction (Weick, 1995; Weick et al., 2005; Vaaar et al., 2006).

Network governance

Much of the governance literature that has been reviewed in the previous section has originated in the study of dyadic relationships. Even as these dyads may be considered part of a broader multi-actor organization (Anderson et al., 1994), analyzing the structures and process of the 'network as a whole' can provide an additional

understanding of network governance, structure and dynamics (Kilduff and Tsai, 2003; Provan and Milward, 1995; Soda et al., 2004).

Beyond the actual mechanisms used to coordinate networks, understanding the governance of a network involves analyzing the extent to which the definition of these coordination mechanisms is shared among different actors or concentrated in one or a few organizations, as well as the factors influencing this process (Brass and Burkhardt, 1992). In a network setting, it has been observed that a key group of nodes within the network often play a central role as the main carriers of rules and practices (Hendry et al., 1999) and result in the development of dominant logics at network and community levels (Owen-Smith and Powell, 2004).

The ability to influence the conditions of a network, including its structure and governance mechanisms, has been associated with an ability to exert the power to create these changes. Though there is limited agreement on a precise definition of power, one general characterization refers to power as the 'ability to influence, control, or resist the activities of others' (2008).

Power in a network can emerge from need imbalances (Salancik and Pfeffer, 1977), importance imbalances (Inkpen and Beamish, 1997; Cox, 2001; Gereffi et al., 2005), structural position in the network (Burt, 1992; Freeman, 1979), uncertainty reduction (Huczynski and Buchanan, 2007; Burkhardt and Brass, 1990), external sources (Benson, 1975), or cross-linkages and interlocking relationships with other organizations (Stearns and Mizruchi, 1993; Mizruchi and Galaskiewicz, 1994; Gerlach, 1992).

In the sustainability literature, Gereffi (1994) identifies importance and type of task as the main drivers in determining where the power in a value chain resides, distinguishing producer-driven from buyer-driven chains. Gereffi et al. (Gereffi et al., 2005) further develop this typology distinguishing five types of governance: market, modular, relational, captive and hierarchy, based on information requirements of the transaction, ability to codify and the capabilities of suppliers as factors determining the power of the various actors. Potts, Fernandez and Wunderlich (Potts et al., 2007) point out the structural inequalities in information and education that determine the limited opportunities for producers to influence the decisions on commodities such as coffee and cocoa. Tallontire (2009) offers an extension of this argument by proposing a trading system that concedes more power to institutions such as Fair Trade Labelling Organization, outside the specific value chain but influencing the way in which the value chain operates.

Social network analysis offers an alternative approach to identify opportunities for power by mapping the relationships and identifying possible sources of power based on occupying certain positions. Nohria (1992) proposes that actions and behaviour of individuals and organizations can be explained, at least partly, in the context of their position in a network. Centrality can be used to assess the relative position of actors and the degree to which certain actors hold prominent network positions, often

associated with power and influence (Freeman, 1979). Burt (1992) identifies a privileged position in a network as one occupied by actors with brokerage opportunities among other actors, also referred to as spanning ‘structural holes’ in a network (Burt, 1992).

Summary of literature overview

Table 1-2 summarizes the key concepts identified in the literature informing the research questions reviewed above. The findings from the Systematic Literature Review are presented in detail in Section 2.7. In addition to this, Section 3.3 also addresses governance mechanisms and Section 4.3 does so regarding the literature on network structure and complexity.

Table 1-2: Literature summary

Area	Literature
Context conditions	Social relationships among individuals and the social context in which an organization operates influence its economic actions (Granovetter, 1985; Granovetter, 2005), its decisions to enter networks (Gulati, 1995b) and the organizations that it will establish relationships with (Gulati, 1995a).
	Interpersonal trust can support inter-organizational trust but also prevent dissolution of faltering agreements (Adobor, 2006).
	The effect of interpersonal ties at network level is limited and inconclusive (Olk and Earley, 2000), unclear role vis-à-vis inter-organizational trust (Zaheer et al., 1998).
	The role of personal ties can be different at different stages in a relationship. In an entrepreneurial setting, interpersonal relationships play a stronger role in the initial stages than later in the life of the firm (Eisenhardt and Schoonhoven, 1996; Hite and Hesterly, 2001).
Network structure, complexity and network evolution	Network complexity can be explained as a factor of the number of organizations participating in the network, the degree of differentiation among organizations and the level of inter-relations among them (Choi et al., 2001). Reduction in complexity may lead to lower transaction costs and increased supplier responsiveness, but it can also create increased risk and reduced supplier innovation (Choi and Krause, 2006).
	Networks that are more centralized around a lead organization can be easier to manage (Freeman, 1979), while dense network with high proportion of all possible ties present can give an indication of the degree of cohesion and suggest higher travel of information speed (Wasserman and Faust, 1994). In entrepreneurial contexts, networks decrease in density and cohesion over time, making these networks more difficult to manage (Hite and Hesterly, 2001).
	Changes in structure occur as a result of environmental factors (Hannan and Freeman, 1977), purposeful managerial action (Inkpen and Currall, 2004; Davis 2008; Ariño and Reuer, 2004) or can occur without any singular entity deliberately managing or controlling it (Holland, 1995).
Governance mechanisms and evolution of governance	Reliance on formal mechanisms increases when there is higher environmental uncertainty or risk of opportunistic behaviour (Williamson, 1979; Williamson, 1985), and decreases when there is reliance on embedded social structures (Granovetter, 1985), previous inter-organizational relationships (Gulati, 1995a) or initial relationship quality (Ariño and de la Torre, 1998).

Area	Literature
mechanisms	Over time, increased trust, confidence and commitment lead to increased use of informal governance mechanisms (Doz, 1996; Ring and Van de Ven, 1994; Inkpen and Currall, 2004). An increased use of formal mechanisms over time is associated with misunderstandings, conflicts and changing expectations (Ring and Van de Ven, 1994) or uneven learning among partners (Das and Teng, 2002; Inkpen and Beamish, 1997).
Network governance and power	In a network setting, a key group of nodes often play a central role as the carriers of rules and practices (Hendry et al., 1999; Owen-Smith and Powell, 2004). Power in a network can originate from multiple sources including importance imbalances (Gereffi, 1994), external sources (Benson, 1975) occupying central position in a network (Freeman, 1979), spanning gaps or structural holes in a network (Burt, 1982).

1.8 Research findings overview

Using the framework presented in Section 1.7, the research analyzed the data emerging from the field research related to the gaps and opportunities found in the literature review, focusing on the identified research questions:

RQ1: How do context conditions influence the creation and evolution of networks?

RQ2: How and why do governance mechanisms evolve over time?

RQ3: How and why does network structure evolve over time?

This section summarizes the findings of the research emerging from the analysis carried out in Project 2 and Project 3, which are detailed in Section 3.6 and 4.5 respectively. It aims to provide an integrated perspective and provide a context for the implications and conclusions of the overall research. The findings are summarized in table format at the end of the section.

1.8.1 Research context

The coffee crisis

The external context in the early 2000s was dominated by the ‘coffee crisis’, with a severe fall in prices compromising the ability of farmers to reach subsistence levels and the overall viability of coffee farming in many producing countries at stake. For companies such as Nespresso, which depend on access to a very specific high quality grade of coffee in increasing quantities, a potential shortage of raw materials in the future could mean a compromise on its aggressive growth initiative. This situation also coincided with presence at Nespresso of a group of managers that were enthusiastic about new ideas on sustainability in the coffee industry.

The Nespresso AAA Sustainable Quality Programme

In 2003, Nespresso, a subsidiary of Nestlé, launched a Programme called ‘Nespresso AAA Sustainable Quality Programme’ in its coffee sourcing operations. The initiative sought to combine the high quality standards that Nespresso required in its coffee with contributing to long-term social, economic and environmental sustainability in its origin countries. As presented by the firm: “The Nespresso AAA Sustainable Quality Programme aims to ensure a unique combination of quality and sustainability –

creating economical, environmental and social value in coffee cultivation. It uses quality as a key driver for sustainable growth and motivates farmers to think long term, and develop initiatives, which help improve their quality of life... Nestlé Nespresso has been working with Nestlé sustainability experts, key suppliers, agronomists and the Rainforest Alliance to create a coffee sourcing program tailored to the particular requirements of Nestlé Nespresso” (Nestlé Nespresso, 2006).

As Figure 1-4 illustrates, the AAA Programme went beyond being a quality programme by integrating sustainability concerns as a core part of the initiative.

Figure 1-4: The three As in the Nespresso Programme



Source: Nestlé Nespresso, 2008

Programme participants

The Sustainable Quality Programme involved suppliers (coffee traders), farmers, non-governmental organizations, consultants and an international development agency.

For suppliers to be a part of the ‘AAA Programme’ an additional agreement, different from that of a regular supplier – which had achieved AA quality – had to be negotiated, and this agreement would specify the specific sourcing areas or ‘clusters’ that would participate in the programme. Suppliers then had exclusive sourcing agreements with Nespresso for coffee sourced in these regions that met the AAA programme criteria (see Section 3.5.3 for additional information on the programme characteristics).

Thus, not all suppliers belonged to the programme, only those that had established a specific agreement with Nespresso and had reached the quality levels *and* put in place the activities related to sustainability.

Though integrated to the supply chain, the triple AAA programme went beyond being purely a quality initiative by incorporating as well a sustainability component. At any point in time it was clear to all participating organizations who was part of the AAA

Programme, combining quality and sustainability, and, in the case of suppliers, which among them were only involved in the quality component, referred to AA suppliers.

As Table 1-3 illustrates, other participants in the AAA Programme were Non-Governmental Organizations (NGOs), mainly those associated to the Sustainable Agriculture Network and associated to the Rainforest Alliance certification label. Two consulting organizations, a development agency and Nespresso's parent firm, Nestlé, completed the roster of members by 2007. The programme initially operated in two geographic clusters³ and involved an NGO network and two existing suppliers. The programme expanded over time and by the end of 2007 it was operating in 10 clusters in 5 different countries and involved 17 organizations and approximately 12,000 farmers.

AAA Programme, Sustainable Sourcing Network, Sustainability Network

During the period under study, the AAA Sustainable Quality Programme was the only major initiative at Nespresso involving sustainability considerations⁴. Participants frequently referred to the programme as just 'The Triple A' or also as 'Nespresso's Sustainability Programme'. For purposes of this research, and to distinguish it from the pure commercial network that is addressed separately in Project 3, I refer to Nespresso's AAA Sustainable Quality Programme also as Nespresso's sustainability network, composed by the local, regional and global organizations included in Table 1-3. This is the network that was analyzed in Project 2 and Project 3 and participation in the programme determines the boundary of the network analyzed using Social Network Analysis in Project 3.

³ Clusters are geographic regions where the conditions for Nespresso's required coffee quality exist. These clusters are identified and developed in partnership with a coffee supplier, who is granted exclusivity over the region for Nespresso purchases of green coffee.

⁴ An initiative called 'Ecolaboration' was launched in 2009 that also included a recycling program and coffee making machine expanding the concept of sustainability in Nespresso beyond the initial AAA sourcing Programme.

Table 1-3: Organizations involved in Nespresso's AAA Programme (Sustainability Network) between 2003 and 2007

Organization type	Organization	Description	Year joined
Roaster - Buyer	Nespresso	Subsidiary of Nestlé, roasts and packages coffee in patented system, sells directly to end consumers	2003
	Nestlé	Consumer goods company: food, beverage, nutrition and wellness	2003
Coffee Traders (Buying green coffee in origin country and selling to roasters)	Expocafé	Colombian coffee trader, owned by 36 cooperatives European sales office based in Switzerland	2003
	Ecom	Global coffee trader with operations in 20 countries, headquartered in Switzerland	2003
	National Coffee Federation of Colombia (FNC)	Colombian coffee trader and not for profit institution supporting coffee farmers and farming communities; European Sales office based in Belgium	2005
	Volcafé – ED&F	Global coffee trader with operations in 21 countries, headquartered in Switzerland	2006
	Neumann	Global coffee trader with operations in 28 countries, headquartered in Germany	2007
	Cooxupé	Brazilian coffee cooperative – Largest private coffee cooperative in the world	2004
	Efico	Responsible for European sales of Cooxupé, based in Belgium	2004
Non-Governmental Organizations (NGOs)	Rainforest Alliance	Pursues biodiversity conservation and sustainable livelihoods Has its own certification label but also works with company-specific sustainability programmes Acts as Secretariat of Sustainable Agriculture Network	2003
	Sustainable Agriculture Network	Local-based biodiversity conservation NGOs in nine countries. Rainforest Alliance – Costa Rica Fundación Interamericana Investigación Tropical – Guatemala FundaNatura – Colombia Imaflora – Brazil	2003 2003 2004 2004 2005
	Technoserve	Helps entrepreneurs in poor rural areas of the developing world to create economic growth	2006
Consultant	GoodBrand	Provides support to corporations in developing corporate social strategy	2003
Multi-lateral development organization	International Finance Corporation	Member of the World Bank Group providing investment and advisory services to build the private sector in developing countries	2007

1.8.2 Network context, initial structure and conditions

Network context and multiplex relationships

Even though sustainability sourcing was a new initiative for Nespresso and for many of the actors involved, most organizations participating in the Nespresso AAA Sustainable Quality Network had a history of previous relationships. All suppliers that were initially involved in the programme had pre-existing commercial ties and several also had personal ties with other programme participants. Two types of embedded relationships (in addition to the relations established as part of the Sustainability Programme) were analyzed: Commercial relationships, independent of any resource transfer within the scope of the AAA Programme; and Personal (positive) relationships among individuals belonging to the organizations or between an individual and an institution. Section 4.6.4 and 4.6.5 detail the characteristics of these relationships and the criteria for determining existence of a linkage. Overall, 26 out of the 37 organizations participating in the AAA Sustainability Network had at least one commercial type of relationship with another organization, and 30 out of the 37 organizations participating in the AAA Sustainability Network had at least one personal type of relationship with another organization by 2003. The one area where there is a minimum of or no prior relationships is between Nespresso and traders with the NGO that was invited to participate in the programme.

Initial network structure

The initial Sustainability Network involved 11 organizations or 'nodes' that established relationships and conducted activities related to the Nespresso AAA Sustainable Quality Programme in 2003. The network initiated operations in 2 locations or 'clusters' in 2 countries and established a total of 25 ties among the suppliers, NGOs and Nespresso organizations during that year. Section 4.6.1 presents a visualization of the connections among the organizations participating in the Nespresso AAA Sustainability Network from 2003 to 2007 (Figure 4-3), built using software program Netdraw (Borgatti 2002).

Since its inception the network exhibited a 'mesh' structure, with actors interrelated with one another. Its density – the proportion of all possible ties that are actually present, excluding isolated nodes – was moderately high in the first year, with almost half the possible ties present. Cohesive networks are characterized by high density, mutuality among group ties and a higher relative frequency of ties among group members than non-members (Wasserman and Faust, 1994; Blau, 1977). Indeed, most participants perceived a high level of interconnectedness in the programme, described as a period of intense communication among all actors. The network was also moderately centralized around the focal organization Nespresso headquarters, with a Freeman centralization degree for the overall network of 54.4% and with Nespresso accounting for 18% of this measure. Centrality, used to assess the relative position of actors and the degree to which certain actors hold prominent network positions, is often associated with power and influence (Freeman, 1979). Please refer to Section

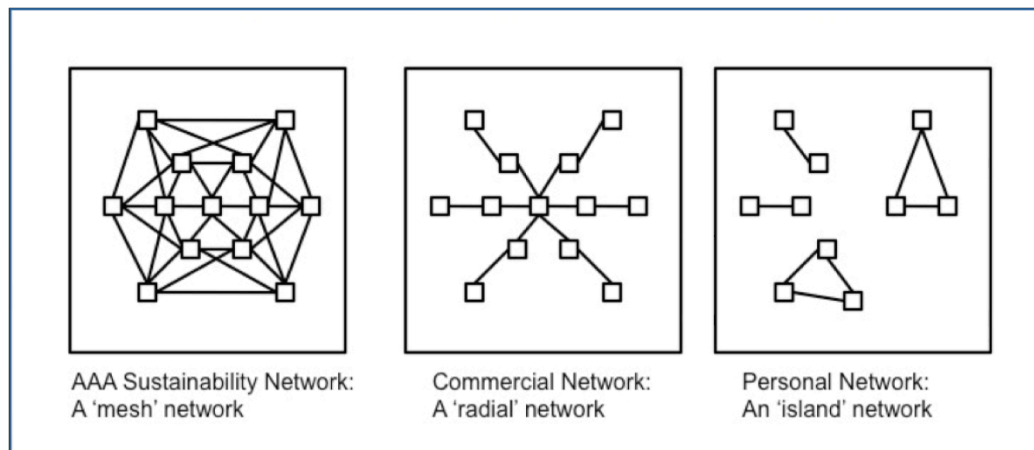
4.6.1 for an expanded account of network characteristics using Social Network Analysis techniques.

The structure of the Commercial Network was different from the Sustainability Network and was configured in a radial shape centred on Nestlé and Nespresso, the purchasing organizations. This network also had a higher level of centralization, with a Freeman degree of 54.3% in 2003, and exhibited a low level of density, with only 13% of the possible ties among organizations present in the initial period.

The Personal Network presented again a different structure from the other two networks, shaped in the form of 'islands' of personal relationships across organizations. Accordingly, the network showed a very low centralization degree, measuring a Freeman degree of 14.5% in 2003 and a large number of isolate nodes. It was also a very disperse network, with a low density and only 7% of total possible ties realized in the initial period.

Figure 1-5 is a graphical simplified version of the Sustainability, Commercial and Personal network structures, a detailed version of which can be found in Section 4.5.

Figure 1-5: Compared network structure forms



Initial network governance mechanisms

Pre-existing relationships, few actors and a high level of motivation of actors involved led to very intense and frequent communication among all parties. This communication consisted of frequent group video or telephone conference calls, continuous e-mail exchanges and telephone calls. There were also several opportunities for face-to-face interaction between organizations, both at the central level and locally, at producer country locations.

As indicated in the interviews, excerpts of which are quoted in Section 3.6, governance mechanisms were mostly informal during this phase, relying on norms rather than on formal coordination mechanisms. Formal coordination mechanisms such as contracts,

pledges or formal communication mechanisms were kept to a minimum and documents signed among the parties at the time showed limited coverage of formal reporting, dates for activities to take place or a communications schedule (Nestlé Nespresso and Rainforest Alliance, 2003; Nestlé Nespresso, 2003).

1.8.3 Network evolution

Context evolution

The external context evolved from 2003 to 2007 with sustainability initiatives in the coffee sector continuing to expand and starting to reach more mainstream industry actors. The level of affiliation of participating organizations to other industry sustainability programmes was measured, finding that all of the organizations were involved to some extent in other sustainability programmes. Section 4.6.7 describes the multiple connections and presents a map of the cross-affiliations using graphical software to illustrate the degree of cross-affiliation among programmes. The analysis found that all 23 nodes representing the traders were associated to at least one other initiative by 2007, and that 19 out of the 37 participating organizations were linked to each other by joint affiliation to all 6 programmes, in addition to Nespresso's AAA initiative. Further, 4 organizations were linked by joint affiliation to 5 of the 6 programmes.

Internally at Nespresso there was also an increased role assigned to the programme and the change in orientation from an 'exploratory' type of programme to its inclusion as a core part of the supply chain activities. This also motivated the desire to move from what was still a series of relatively independent projects to a more consistent overall programme, as well as the need to increase the efficiency of communications as the flexibility with which the programme was initially handled required intense and frequent communication among actors and resulted in frequent inconsistencies and delays. In 2005, a new green coffee manager arrived at Nespresso, continuing the growth but also making changes to the structure, conditions and governance mechanisms of the network.

Structure evolution:

Between 2003 and 2007 the structure of the sustainability programme evolved significantly, expanding the number and type of actors involved and increasing its level of complexity. From the initial 11 organizations in 2003, the network had almost doubled the number of participating organizations by 2004, and had expanded the number of ties among these organizations by a factor of almost three. In 2005, alongside a reorganization of the network to increase efficiency, only 5 new organizations were incorporated and the number of total ties increased to 66, with 18 new ties being created and 13 being deleted (or reoriented by changes in the coordination structure). At this time, a regional office was set up in Costa Rica to manage the programme at the local level. The programme continued expanding in 2006 with participation of 6 additional organizations and creation of 17 new ties. In 2007, an additional regional coordination office was set up in Colombia. As it had

happened in 2005, a similar shift took place that re-oriented some of the coordination of activities to the newly created organization. During this year, 5 new organizations (including the regional office in Colombia) were incorporated into the network, 26 new ties were created and 6 were deleted or reoriented. Section 4.6.1 presents a visual evolution of the network's structure while Appendix 6.10 shows the evolution of linkages among organizations in a matrix format.

The Sustainability Network became less dense over time, with proportionately fewer ties present among organizations. From 45% of all possible ties present in 2003, this rate had dropped to 16% by 2007, implying a progressively sparser or non-redundant network. Additional distance measures presented in Section 4.6.1 also show an increasingly sparser network, with long paths between connected actors.

The commercial relationships evolved at a slower rate than the newly created Sustainability Network. In the Commercial Network, only 2 ties were established in 2003 (the remaining ones predating that year) and one of those was with the National Coffee Federation of Colombia through its representative in Europe, an organization that was already present in the Personal Network. From that point and until the end of the period analyzed, the Commercial Network remained constant in terms of number of organizations involved. The Commercial Network exhibits a low level of density, from 13% of possible ties present in 2002 to 15% of total possible ties being realized by 2007. The Commercial Network continued to be highly centralized, showing a 52.0% Freeman centralization degree by 2007, slightly lower than the 54.3% of 2003. Section 4.6.4 includes additional social network analysis measures and evolution during the period studied and Section 4.7 discusses the implications of these findings on network creation and expansion and multiplex positional power implications.

The Personal Network also evolved at a slower rate than the Sustainability Network during the period 2003-07. As the programme evolved, however, some individuals within some organizations were in close contact with multiple organizations. Personality-fit as well as field visits, stakeholder forums and informal gatherings also contributed to the establishment of personal relationships among organizations and a total of 12 new ties were established between 2004 and 2007. The density of the network was considerably lower than in the Sustainability Network, with only 12% of the total ties being realized in 2007, and it had a low level of centralization with Freeman's degree ranging from 14.5% in 2002-03 to 11.6% in 2007. Section 4.6.5 includes additional social network analysis measures on the Personal Network, its evolution during the period studied and, as in the case of the Commercial Network, Section 4.7 discusses the implications of these findings on network creation and expansion and multiplex positional power implications.

The Pearson correlation procedure was used to measure the relationships across multiplex networks, as detailed in Section 4.6.6. This measure is used to identify possible correlations between membership to one network and future membership to this or any of the other two networks. As expected, the analysis showed that membership to a network during the analyzed period was strongly correlated to

membership to the same network in the future. The correlations among different networks, however, also indicated a moderately positive relationship, with Commercial Network membership and AAA Sustainability Network membership showing a Pearson index of 0.202 to 0.369. Membership to the Personal Network had a stronger positive correlation with the Sustainability Network, with Pearson's coefficient ranging from 0.227 to 0.704. Lastly, there was also a moderate positive correlation between the Personal and the Commercial Networks, with Pearson's coefficient ranging from 0.386 to 0.451.

Evolution of Governance Mechanisms

The new manager brought into the organization in 2005 led a reorganization of the programme by focusing on defining the process through which local implementation of the programme was managed, setting up key performance indicators (KPIs) to measure progress of the clusters and of the organizations involved, and establishing formal contracts with partners that included achievement of these KPIs.

Coordination tools introduced by the manager responsible for the project after 2005 included objective setting sessions and periodic performance reviews with suppliers (Nestlé Nespresso and Rainforest Alliance 2005), and a new 'Terms of Agreement document' signed between the NGO and Nespresso in 2005 assigning specific responsibilities (Nestlé Nespresso and Rainforest Alliance 2005). Structured annual review meetings with suppliers brought a new level of formality to the process. Product traceability and financial transparency also became part of the programme's increased specificity.

The evolution of governance mechanisms thus entailed a shift from using informal mechanisms almost exclusively to an increased use of formalization and structured coordination mechanisms. But beyond the formal communication and coordination process there was also an explicit intention to continue building relationships among the various stakeholders. Relationship building activities, which in the first stage occurred naturally, were part of the programme planning activities that were undertaken during the second phase, and Stakeholder Forums were organized in 2005 and 2007 (Nestlé Nespresso 2007; Nestlé Nespresso 2005).

1.8.4 Network governance and power opportunities

As the initiator and focal organization of the Nespresso AAA Sustainable Quality Programme, Nespresso headquarters had a high level of formal power. During the course of the interviews, most respondents explicitly or implicitly attributed to Nespresso a high level of formal power that was exercised through consultative or unilateral decision-making regarding the organizations that formed the network, the network structure and the activities, resources and coordination mechanisms. In addition to the formal sources of power available to Nespresso as the focal organization in the network, position of the actors in a network was analyzed as a potential source of power (Brass and Burkhardt, 1992).

The structure analysis of the Sustainability Network is detailed in Table 4-5, Table 4-6, and Table 4-7 in Section 4.7.4. The data indicate that Nespresso headquarters consistently occupied a central – though decreasingly so – position in the network. In 2003, Freeman’s centralization degree for the organization represented an 18% share of the total. By 2007, Nespresso headquarters’ centralization degree represented only 6%. This was, however, offset by presence of the regional organizations, which by 2007 accounted for 7% of the total network centralization.

The local NGO organizations in the areas where the programme was most active (Colombia and Costa Rica) occupied the next level of central positions. These organizations were connected to the local operations but also to all other local NGOs through the Sustainable Agriculture Network.

In addition to assessing the positions occupied by organizations in the Sustainability Network, the research also included an analysis of the relative position of these organizations in the Commercial and Personal multiplex networks. The structure analysis that was performed for the Nespresso AAA Sustainability relationship was replicated for the Commercial and Personal Networks. Section 4.6.4 and Section 4.6.5 present the actors occupying powerful positions in these networks, showing that they are not necessarily the same ones occupying central positions in the AAA Sustainability Network.

Nestlé headquarters, the parent organization of Nespresso, for example, has a very central position in the Commercial Network, with commercial linkages with most traders that participate in the AAA Sustainability Network. Ecom and FNC Colombia also occupy central positions in the Commercial Network as they are responsible for commercializing the product from multiple ‘clusters’ or sub-regions participating in the AAA Sustainability Network. Though the analysis didn’t include the relative size of the different organizations, it should be noted that Nestlé, as the largest coffee roaster in the world and concentrating 20.2% of the total global market (Euromonitor Global Market Information Database, 2008) is a major customer for coffee traders.

In the Personal Network, the higher degree of centralization in 2002-03 was reached by the National Coffee Federation of Colombia (FNC), an organization that was not at the time part of the AAA Sustainability Network but that linked at a personal level the so called ‘Colombian club’ that included two executives at Nespresso, the representative of Expocafé in Europe, local operations in Colombia and the FNC representative in Europe. Informal communications among this group of actors were very active, with a strong level of professional trust based on previous work experiences or institutional appreciation. The NGO Network also had numerous personal linkages among the local organizations as they had been part of this network and had developed personal relationships over time.

1.8.5 Summary findings overview

Based on the overview of findings, Table 1-4 summarizes the key research findings.

Table 1-4: Summary of findings - Evolution of network variables

Area		Initial	Evolution
How do context conditions influence the creation and evolution of networks?	External	Coffee crisis, NGO pressure – Sustainability programmes are new to the industry, high degree of uncertainty on how the programme should be structured or operated.	Lower environmental uncertainty Multiple competing sustainability programmes and increased experience of all actors around sustainability initiatives.
	Actors – Organizations	Pre-existing commercial and personal relationships with suppliers initially involved in the programme. High level of motivation.	Multiple connections among actors spanning across different networks Actors increasingly involved in multiple industry sustainability efforts
	Multiplex networks	Of the 37 organizations participating in the network at some point, 26 had at least one commercial and 30 had at least one personal type of relationship with another at the beginning of the period.	Personal relationships also created during the programme. Pearson’s coefficient indicates positive correlation between Personal Network and Sustainability Network over time. Moderately positive relationship between Commercial Network and Sustainability Network.
	Affiliation networks		All 23 nodes representing the traders were associated to at least one additional industry initiative besides Nespresso’s. Of the 37 organizations, 19 were linked to each other by joint affiliation to all six industry initiatives.
How do network structure and governance mechanisms evolve over time?	Network structure	Network composed of 11 organizations, operating in 2 clusters in 2 countries. Density of network = 45% Centralization of network (Freeman degree) = 54.4% Nespresso headquarters occupies central position in network.	Network grows to include 37 organizations, 10 clusters in 5 countries. Density of network = 16% Centralization of network (Freeman degree) = 27.7% Nespresso’s Regional Coordination offices occupy the most central positions in the network.
	Network governance	Actor-led network. Nespresso headquarters is the formal lead organization and also occupies a central position in the network.	Over time the Nespresso Regional Offices occupy the most central roles in the network, followed by regional NGO offices and Nespresso headquarters.
	Governance Mechanisms	Mostly informal mechanisms – Continuous communication, high level of trust built on pre-existing multiplex relationships.	Increased use of formal mechanisms in addition to pre-existing norms. Promotion of relationship building activities.
What are the mediating variables	Network orientation	The network is used mainly as an explorative and experimental vehicle.	The network becomes a core part of the supply chain activities. Increased clarity, efficiency and results orientation is sought by the lead organization.

Area		Initial	Evolution
impacting the evolution of structure and governance mechanisms?	Network complexity	Network has lower complexity, being small and cohesive, with high density of ties among actors and high centralization.	Network becomes more complex as a result of rapid growth, increased relationships among actors, variety of actors and decreasing centralization.
	Network re-structuring		Management action reconfigures network linkages establishing regional offices to coordinate activities, increase efficiency and enable growth.
	Multiplex ties	Central actors in Personal Network based on pre-existing relationships also occupy central positions in the initial Sustainability Network.	Central actors in Personal Networks are also central actors in Sustainability Network.

1.9 Discussion

1.9.1 Introduction

This section contrasts the research findings with existing theory and discusses the implications for theory and practice. The discussion is organized around themes that address the research questions, followed by the implications deriving from the research and, when applicable, new theory propositions. This thesis uses the term implication to integrate conclusions that can be inferred from the research whereas propositions are intended as new contributions to the body of theory and of practice.

1.9.2 Implications for theory

Embeddedness, network creation and evolution

The research identified a number of pre-existing relationships that predated the creation of the sustainability programme and that are analyzed in Project 3. Clearly, the new programme didn't start with a completely blank piece of paper. As maintained by Granovetter (1985), the social relationships among individuals and the social context within which an organization operates influence the economic action of organizations. The findings thus uphold this premise and also lend empirical support to the concept that repeated transactions or relationships among organizations, leading to increased familiarity and trust, can influence the decision to enter new alliances or networks (Powell et al., 1996; Gulati, 1998; Gulati, 1999).

Beyond the effect of embeddedness at the organization level, however, the effect of interpersonal ties at the network level has been limited thus far and empirical research considered inconclusive (Olk and Earley, 2000). This research explores this issue by extending to the network of personal relationships and the implications it holds for the network, measuring the correlation between these networks over time, as presented in Project 3, Figure 4-9. The research found a moderate but positive correlation between all networks, and suggests personal and commercial networks as predictors of sustainability relationships. In addition, the AAA Sustainability Network was also

found to be a predictor of future Personal Network linkages as, over time, personal relationships evolved as part of the work related to the AAA Sustainability Network activities and specific formal and informal events organized.

Implication 1-1: The research provides empirical support to the theory that pre-existing multiplex relationships can influence the choice of partners in the creation of new networks. It also supports the role of interpersonal relationships influencing inter-organizational linkages and, in turn, these inter-organizational linkages influencing new personal relationships.

From informal to mixed governance mechanisms

Nespresso's AAA Programme represented a new area of operation, which Eisenhardt and Schoonhoven (1996) would qualify as a 'vulnerable strategic position' with a high degree of uncertainty. Much of the network literature, especially in TCE, states that under conditions of uncertainty individual party interests can be protected through formalized governance mechanisms (Williamson, 1975; Williamson, 1979). Further, clarity on opportunities associated with the objectives and scope of the collaboration, resources required, contributions of individual parties and the benefits of collaboration have been considered important factors in determining the initial structure of the network and the success of the relationship (Kumar and Anderson, 2000; Human and Provan, 2000; Doz and Hamel, 1998; Bryson et al., 2006).

The findings from the case, however, do not support this position. As presented in Project 2, Sections 3.6.2 - 3.6.3, the initial negotiations of Nespresso's AAA Programme relied on relatively vague Memorandums of Understanding being drafted at the time of the programme launch and limited use of formal reporting or communication structures. Nespresso's AAA Programme was initiated with small experiments, pilot projects and ad-hoc budgets. Far from determining its failure, this flexibility helped the actors shape the programme incrementally instead of doing so at the outset, when the level of environmental uncertainty was very high.

This initial structure was supported mostly by informal coordination mechanisms. These have been found to be effective in providing confidence to a party that a condition of vulnerability will not be created by relinquishing control and to increase confidence (Heide and John, 1992), but they are generally viewed as an evolution of the relationship and not as a governance mechanism with which to initiate one. The informal mechanisms of coordination allowed for the network to be explorative in nature (March, 1991), involving innovation, risk taking, building new capabilities and entering new areas of operation, and provided the freedom that was needed to experiment. Pre-existing relationships built through pre-existing commercial and personal relationships supported this phase, allowing for experimentation and risk-taking supported by trust 'transferred' to this new situation.

As discussed in the previous section, pre-existing commercial and personal ties, mostly with suppliers, may have supported a situation where increased level of trust among

partners lowered the need for formal mechanisms (Granovetter, 1985; Gulati and Gargiulo, 1999; Gulati, 1998; Gulati, 1999).

In the research case, formal governance mechanisms were set up over time. Contrary to what much of the network literature indicates, formalization and supplemental agreements were not designed to deal with misunderstandings and conflicts (Ring and Van de Ven, 1994) or to rebalance the relationship (Ariño and de la Torre, 1998). Rather, as examined in Project 2, Section 3.6.6, this introduction was associated with the need to grow, to enable measurement of identified specific objectives, and to bring clarity to current and new actors involved in the relationship. As collaboration developed from an experimental and project-based initiative to a more structured and more comprehensive programme, governance mechanisms were found to co-evolve with the nature of the network, which over time had been impacted by March's (1991) 'exploitation' types of activities, increasing productivity and including activities such as standardization, routinization, definition and measurement of performance and cost reduction (Koza and Lewin, 1998; Cohen and Levinthal, 1990; Lewin et al., 1999).

Implication 1-2: The findings of the research contradict literature that states that governance mechanisms evolve from formal to informal as the relationship evolves. The network in the research initially relied mostly on informal mechanisms of coordination. As the relationship evolved, formal mechanisms were introduced, not to deal with misunderstandings and conflicts or to rebalance the relationship but rather as a way to facilitate sense making, increase efficiency and set the basis for expansion of the programme.

Proposition: In conditions of uncertainty, flexible conditions and the use of informal governance mechanisms supported by trust facilitate a search and experimentation process.

Proposition: Formalization of governance mechanisms at a later stage in a relationship can promote clarity and efficiency, and facilitate expansion of the scale of collaborative activities.

Network expansion, complexity and managerial action

The AAA Sustainability Network studied in the research experienced fast growth over the period considered. Using Choi et al.'s (2001) conception of complexity, the network also became more complex as the number of organizations increased, additional inter-relationships among organizations were established and differentiation of the organizations broadened with the incorporation to the network of new types of organizations such as public sector entities.

The level of complexity could also be perceived using the social network analysis measure of centralization, as analyzed in Project 3, Section 4.6.1. A decreasing level of centralization around the focal actor, such as was the case in the research, can indicate

lower ease of integration and coordination (Provan and Milward, 1995) and thus, it can be argued, increased complexity.

Implication 1-3: The network became more complex over time as the number and differentiation of organizations increased and centralization around the focal organization decreased.

Proposition: Network complexity is influenced by network size, the degree of differentiation among actors, level of inter-relationships and level of centralization of relationships in the network.

This level of complexity can be moderated by modifications in the structure of the network. Choi and Krause (2006) point to the capability of a focal firm in a supply network to actively manage the supply base. The network architectural perspective also identifies actions of alliance managers as major drivers of change in the networks (Ariño and de la Torre, 1998; Inkpen and Currall, 2004; Kogut, 1988; Hamel et al., 1989; Davis 2008) and point to the 'plasticity' of networks that can be 'pruned' and 'paired' to adapt the network structure to the needs of the network or of the focal organization (Davis 2008).

In the case studied, the focal organization, Nespresso headquarters, intervened in the structure of the network to moderate its complexity by introducing sub-focal organizations in the form of regional coordination offices, analyzed in Project 3, Section 4.7.3. The strategic objectives in 2005 had become to provide structure and organization to a sometimes-chaotic communication structure that generated increased complexity and threatened the opportunities for growth. The lines of communication and coordination were re-configured by Nespresso and the Regional Managers took a central role in coordination of the programme. Deliberate action in this case, therefore, was aimed at regionalizing communication flows, increasing efficiency and thus reducing complexity. The result was 'shared' centralization between the focal organization (Nespresso headquarters) and the Regional Management Offices.

Extending Choi and Krause's (Choi and Krause, 2006) interpretation of complexity to incorporate social network analysis measures, I propose that network managers or focal organizations can lower the complexity of a network by modifying its structure to create or re-organize linkages with intermediate organizations, positively impacting the centralization and ease of management of the network.

Implication 1-4: The focal organization attenuated the impact of increased complexity by introducing coordinating nodes that centralized portions of the network organizations around them.

Proposition: Network managers in focal organizations can reduce complexity in a network by introducing or managing nodes that re-centralize relationships towards these nodes.

Positional Power and multiple networks

As evidenced in the vast literature on the topic, power can emanate from multiple sources (Huxham and Beech, 2008). This research focused mainly on two sources of power: formal power and power derived from occupying privileged positions in the network structure.

As the initiator and focal organization of the AAA Nespresso Sustainable Quality Programme, Nespresso headquarters benefited from a high level of formal power. In addition to this, Nespresso headquarters also occupied a central position in the network, a position that has been identified in the literature as a possible source of power (Brass and Burkhardt, 1992). An analysis of the network structure detailed in Section 4.6.1-4.6.2 indicates that Nespresso headquarters consistently occupied a central – though decreasingly so – position in the network. A second group of actors, the NGO organizations, occupied the next level of central positions. The local NGO organizations in the areas where the programme was most active (Colombia and Costa Rica) were placed in central positions in the network, connected to the local operations, but also to the Sustainable Agriculture Network that all local NGOs involved in the programme belonged to. This position did offer advantages for information sharing across NGOs in different locations. In addition, the Sustainable Agriculture Network exerted influence on the creation and evolution of the network as a result of their expertise on the topic and subsequent participation in and co-creation of the programme guidelines.

In addition to the sources of power residing in the AAA Sustainability Network, the research also uncovered powerful positions in multiplex networks that influenced the evolution of the AAA Sustainability Network. As presented in Section 1.8.3 and detailed in Section 4.5, the multiplex networks exhibited different structure patterns and central positions. For example, the ‘clique’ structure found in the Personal Network involving an influential Colombian across different organizations influenced the Sustainability Network during the period, even though not all the organizations were central (or even present) in the initial Sustainability Network.

The social network approach identifies central position in a network with increased power opportunities (Nohria, 1992; Freeman, 1979). Based on the findings of the case, I propose extending this relationship between structure position and power to also integrate power opportunities emerging from occupying central location or bridging structure positions in multiplex networks.

Implication 1-5: The research provides empirical support to the theory that power opportunities are likely to be higher for actors occupying central positions in a network.

Implication 1-6: The research extends the relationship between structure position and power to also integrate power opportunities available to actors occupying central locations or bridging structure positions in multiplex networks.

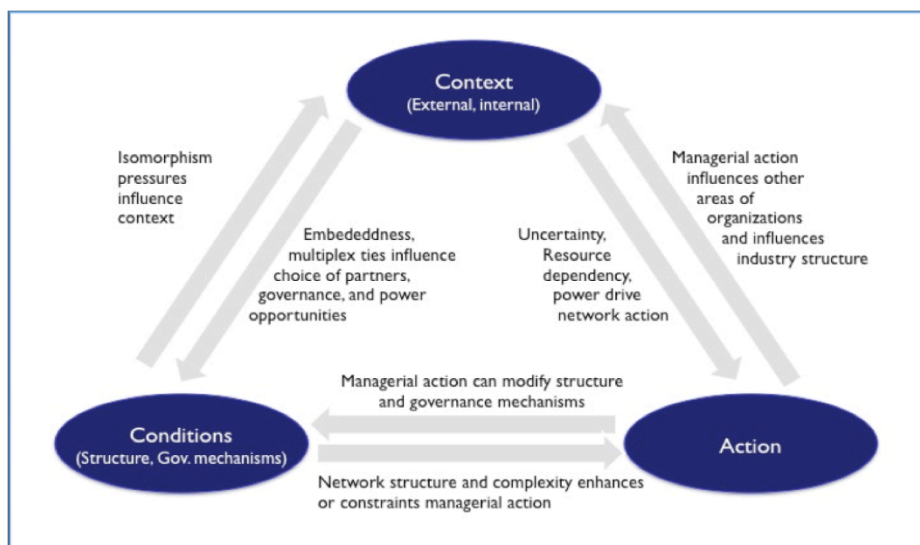
An integrative network evolution framework: Context, Conditions and Action

Based on a longitudinal analysis of a new multi-stakeholder network created to implement a sustainable supply chain initiative, the findings of the research suggest that network structure and governance mechanisms are influenced by managerial action, but are also embedded in a context of multiplex relationships and cross-affiliations among actors, which in turn influence the distribution of power in the network.

Figure 1-6 integrates the conclusions of the research and proposes a framework to analyze co-evolution of context elements, strategic action and network conditions. Context conditions are a driver in creating and modifying networks and uncertainty, transaction costs or resource dependency drive managerial action to form networks. In addition, pre-existing commercial and personal relationships can influence the choice of partners and the initial network structure and conditions. These multiplex ties can also impact the distribution of power in a network, influenced by positions and power of the actors in other networks involving the same actors or with ties to competing networks.

The structure of the network is therefore both the result of context conditions and of managerial action. It in turn influences the environment in which it operates. Although the research did not explicitly explore the issue of isomorphism across sustainability networks, institutional theory literature suggests that conditions in one network can have implications on other networks in the industry through isomorphic pressures (DiMaggio and Powell, 1983; Koza and Lewin, 1998). Evolution of the structure also generates additional complexity for managers to operate. Evolution of the network conditions, including the size, structure and relationships, can influence the complexity of the network and make it more difficult to manage. Managers can, however, actively shape network structures and governance mechanisms to adapt to evolving needs.

Figure 1-6: Co-evolution of networks



Each of these elements and the relationships among them has been explored in the research. Together, they propose a model that contributes to the understanding of the co-evolution of context, conditions and action in networks.

1.9.3 Implications for practice

The research also holds implications for managers involved in network relationships as they explore the need of establishing a network, when they are in the process of creating a network and when managing the structure and governance mechanisms of the network over time. Based on the research findings, a series of inferences on the creation and management of sustainability networks are presented. When applicable, these are followed by new propositions to management practice.

Network exploration

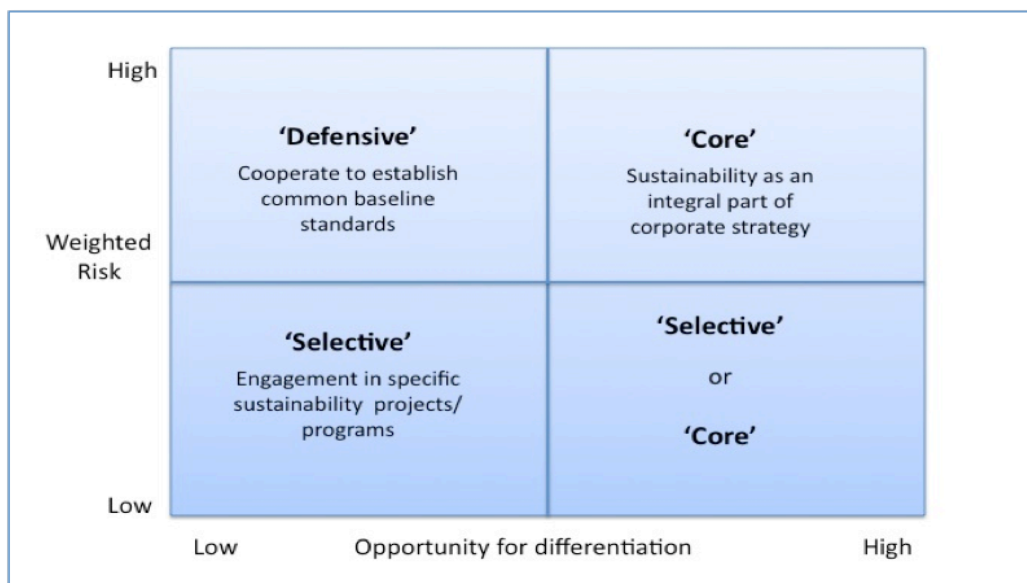
The role of sustainability

As stated by Huxham and Vangen (2005), seeking collaborative advantage is a seriously resource-consuming activity and should only be considered when the stakes are really worth pursuing. The first question that arises for managers then is the role that sustainability plays in the overall business strategy and, only then, should the question on the role that networks can play within the pursued sustainability strategy be pondered.

In a previous publication on this subject (Alvarez, 2010) three archetypal choices are identified for the strategic role that sustainability strategies play in a corporation: a 'defensive' strategy establishing common baseline standards as proactive postures with regulators to influence future regulation (Aragon-Correa and Sharma, 2003), a 'selective engagement' strategy choosing specific areas in the organization that engage in specific sustainability projects or programmes, and 'sustainability as a core' strategy where sustainability is intimately linked to the value, mission and business strategy of the corporation. These choices will have implications for the role of sustainability networks and the choice of partners.

Figure 1-7 represents these choices based on an assessment of the level of risk and the opportunities for differentiation present. In high-risk situations where opportunities for differentiation are nonetheless low (for example, around the issue of child labour or basic food safety standards), corporations can establish 'defensive' relationships with large competitors, other actors in the supply chain with enough weight and NGOs or even governments involved in the topic to set minimum standards and to prepare or pre-empt the arrival of new legislation by acting on self-regulation. Examples of this type of initiative include the Roundtable for Sustainable Palm Oil (RSPO, 2009) and, in the coffee industry, the Common Code for the Coffee Community (Common Code for the Coffee Community Association, 2008).

Figure 1-7: Sustainability and strategy choices



Source: Alvarez (2010)

A second strategic option in areas of lower risk is to selectively engage in sustainability activities. In this strategy, the partners are identified and selected based on the specific area where the sustainability programme will take place. The case analyzed provides an example of selective engagement: sustainable sourcing offered an opportunity to differentiate the company in its coffee sourcing areas vis-à-vis other buyers in the industry in the high-end coffee market. At the time, activities in the coffee machine division or the retail strategy were defined independently and sustainability was perceived as a project initiated and executed by the coffee supply area. Partners were then identified and pursued on the basis of their relevance to this specific engagement and they tended to be focused on these specific activities, as was the case with agricultural-based NGOs, for example.

By contrast, a third strategy option chosen by certain companies is integrating sustainability considerations into the core of what the company is all about. Cafédirect (Cafédirect, 2009) in coffee and tea and Divine (Divine, 2009) in chocolate are two companies where the mission of the corporation is linked with that of Fair Trade products and it permeates the operations of the entire company. In this case, partners are instrumental in achieving company goals as a whole and need to be aligned with the values and culture of the company. The opportunity for differentiation needs to be significant in this case as sustainability becomes a core part of what defines the company.

Identifying potential partners – Scan outside, scan inside, and scan across

In all cases new relationships are likely to be needed and, except for the defensive strategy, these relationships may need to be more cooperative and less arms-length than has typically been the case in supply chain relationships for commodities and other relatively standardized goods.

Most of the management practitioner literature proposes identifying partners based on characteristics that the partner will bring to the table (resources, reputation, lowered transaction costs, etc.). But where to identify these potential partners is generally a topic overlooked in much of the literature. The findings of the research suggest that identifying potential partners can be as much a process of searching *outside* the current environment of the organization as one of searching *within* the organization and *across* current relationships the organization has with other entities.

The research highlights the importance of incorporating information from multiplex networks as well as from the relevant networks to which potential partner organizations are connected. Though field experience suggests this often happens inadvertently, conscious assessment of parallel networks can provide valuable information on where trust, social capital or working knowledge can enable relationship formation to occur with lower risk.

Implication 1-7: Mapping existing relationships of potential partners with the organization or with other organizations can provide valuable input for the identification and suitability of potential partners in the formation of new networks.

Mapping multiplex networks

The question then arises as to how to identify these organizations and the linkages that, especially in the case of personal relationships, may not be evident at first sight. Choi et al. (2001) point to the frustration experienced by managers spending significant amounts of time and resources attempting to map complete supply systems only to find that these have changed quickly and that the mapping process needs to be started all over again.

Mapping personal networks can be accurately done through the use of survey instruments, but this can be extremely time-consuming and costly. However, a number of social network sites exist that map personal and professional connections among people in various organizations. Further, e-mail flows can also be used as a proxy for communication across organizations and analyzed for characteristics such as centrality or density.

Network creation

The initial conditions of the relationship are established during the network creation process. Management literature stresses the importance of establishing clear initial objectives for the relationship, clearly delineating the resources involved and identifying expected results (Ellram and Edis, 1996; Dwyer and Oh, 1988).

The findings of the research offer an alternative view and suggest adapting the governance mechanisms and conditions of the relationship to the objectives of the network and the specific circumstances at the time. For Nespresso and its partners there was environmental uncertainty surrounding the sustainability programme and

hence the end-goal was not clear and there was no appreciation of the resources that would need to be involved or the activities that this would entail. Trying to start the relationship with a clear roadmap can restrict the activities and resources available based on information available at the initial stage of the relationship. This called in a first instance for an exploratory network (March, 1991; March, 1995) in which overly rigid initial coordination mechanisms might have constrained fruitful experimentation. As efficiency and productivity gained relevance, more formal mechanisms of coordination and control, better suited to an exploitation network (March, 1995), became appropriate.

Network management

Managing the relationship over time has been alluded to being more important than the initial definition of conditions in a relationship (Doz and Hamel, 1998). Managers can, and should, adjust the structure, activities, resources and governance mechanisms of a network over time to better reflect the environmental conditions, the objectives of the network and to manage network characteristics such as power dynamics.

Managing network structure

The structure of a network changes over time as actors enter and exit the network. Besides the size of the network, the type of actors involved is also an important characteristic of the network. An implication of the research is the ability that network managers have to shape the structure by inviting (or excluding) certain types of actors. In the Nespresso case, during the first phase of the programme it was important to include actors that would actively collaborate and experiment as the programme was being defined. As time went by and there was an increased need for efficiency, actors that could offer scale were invited to join the programme. These actors were important at this phase because they could offer multiple projects and thus scale up the programme quickly and efficiently. However, given the nature of their size and complexity, they would have found it more difficult to be agile and innovative in the first phase of the programme. At the same time, actors that do not have significant size or geographic scope to offer scalability can still offer an opportunity to experiment with eventual innovations in the programme.

Implication 1-8: By understanding the nature of the network and the objectives pursued, network managers can influence the size and structure of the network and target the type of actors that are more adequate at different phases of the relationship.

Managing the efficiency of the network

As the research indicated, mapping network configuration and using basic network measures such as centrality, density and structure holes can offer managers a perspective on how the network functions, the relative speed at which communication can flow through the network, possible bottlenecks, and the possibility to identify actors placed in central or brokerage positions. By understanding these aspects, network managers have the power to act on the structure of the network and take

action to modify the network pursuing objectives such as increasing its efficiency or lowering its complexity.

Implication 1-9: Managers can actively restructure the formal relationships in a network to increase its efficiency and reduce its complexity.

Managing positional power

The analysis of personal, commercial or other networks can provide, in all stages of a relationship, a broader view of the characteristics of the network and opportunities to exert power based on positions in multiplex networks. Also, understanding the structure of personal or informal networks can offer an important source of information that can be used to introduce changes in the network's structure to enhance or limit the effects of its formal structure. The inverse relationship can also be important as sustainability relationships can also lead to increased commercial activity or personal relationships.

Implication 1-10: Managers can structure the formal relationships in a network to enhance or limit the power of personal or other multiplex networks.

Adjusting governance mechanisms

The research highlighted the importance of treating governance mechanisms not as a fixed variable to be determined once and for all in the beginning of a relationship, but rather to adapt the coordination mechanisms to external and internal context factors and the characteristics of the task at hand. By understanding these variables, governance mechanisms can be adjusted to support the network objectives as they evolve.

Implication 1-11: The governance mechanisms of a network should be aligned with the goals, the nature of the network and the organizations involved. As these evolve, the coordination mechanisms should also evolve.

Lastly, as Granovetter pointed out, there is need of extending the embeddedness concept and to study what happens in a dynamic process where 'you have to look at how people make use of their location in social networks to mobilize resources in order to achieve their economic goals' (Granovetter, 1990).

1.10 Limitations of the Study

The findings and conclusions of this study should be assessed within the context of several limitations. While the research methodology has explicitly incorporated means to reduce the impact of these limitations whenever possible, the choices made in scope and research methodology imply a restriction to the extent to which this can be achieved.

A first limitation relates to the use of a single-case study and the need to observe caution in generalizing any findings beyond the specific context studied. As Doz (1996) states: 'Findings from a few case studies, no matter how carefully sampled and

researched, obviously deserve healthy caution'. Because the number of multi-stakeholder sustainable sourcing schemes already in the execution stage is still very limited, each represents an 'extreme or unique' case rather than being representative of a broader phenomenon. As Yin (1994) argues, this can validate the use of in-depth single-case analysis. However, as Yin (1994) points out, the generalization of results, from either single or multiple designs, is made to theory and not to populations.

A second limitation, inherent in a Doctoral research project, is the use of a single researcher in the design, execution and analysis of the study. This limitation was partially mitigated by active involvement of the supervisor and the Research Panel members at different points in the research challenging the process, methodology, interpretation of the findings and conclusions. In addition, a second coder was involved during data analysis to identify discrepancies in the interpretation of the categories and to limit the extent of subjectivity that may exist in interpreting semi-structured interview data, as suggested by Johnsen et al. (2000).

A third methodological research limitation is the limited number of actors involved in the overall network. Even though assurances of confidentiality were given and efforts to protect the privacy of respondents were made, the reduced number of actors in the network is likely to facilitate linking specific actors to statements made and some of the respondents may have been more cautious than in an anonymous, large sample questionnaire. To minimize the impact of this limitation a triangulation of data and relatively long and semi-structured interviews were carried out.

A fourth and final limitation is the inherent risk of post sense-making or impression management (Eisenhardt and Graebner, 2007) in a retrospective longitudinal study. The selection of respondents representing different organizations, hierarchical levels, geographies and tenures is expected to help mitigate this limitation by representing multiple points of view of the same process.

1.11 Conclusion

This research analyzed the evolution of network structure and governance mechanisms over time as a combination of context conditions, purposeful strategy choices and the participation of network actors in parallel 'multiplex' networks.

The research integrated literature on inter-organizational relationship dynamics that has been mainly applied to dyads (Doz, 1996; Ariño and de la Torre, 1998; Ring and Van de Ven, 1994) and on social network perspective, which approaches 'networks as a whole' (Borgatti and Foster, 2003; Davis 2008; Provan and Kenis, 2008; Koka et al., 2006; Choi and Kim, 2008).

An integrative framework to analyze the co-evolution of context elements, strategic action and network conditions is proposed, presented at the end of Section 1.9.2. An overall summary of this Linking Document, integrating research questions, findings, implications and propositions is presented in Table 1-5.

Table 1-5: Summary of research questions, findings and resulting propositions

Question	Research Findings, Implications and Propositions (Theory and Practice)	References
<p>How do context conditions influence the creation and evolution networks?</p>	<p>Research findings: The research studied external context conditions (uncertainty) and relationship-specific context conditions (multiplex relationships) influencing creation and evolution of networks.</p> <p>External context conditions - Uncertainty: In a context of high uncertainty, governance mechanisms relied initially on informal means of coordination to promote experimentation.</p> <ul style="list-style-type: none"> • Nespresso’s AAA Programme was initiated with small experiments, pilot projects and ad-hoc budgets. Far from determining its failure this flexibility helped the actors shape the programme incrementally instead of having to do so at the outset when uncertainty was too high. • Over time, context evolved to decreased uncertainty and associated increased clarity in terms of the context supporting the relationship. • Trust derived from previous personal and commercial relationships (with suppliers) and transferred trust from the consultant to the NGO contributed to being able to use informal mechanisms to manage the initial relationship. <p>Relationship context conditions – Multiplexity: Pre-existing commercial and personal ties favoured in the creation of the studied network also influenced its structure.</p> <ul style="list-style-type: none"> • Out of the 11 nodes that participated in the initial network in 2003, 8 had at least one type of additional tie with another node. • Pearson correlation measures among the three networks show moderate but positive correlation between all networks. <p>Positional power opportunities for actors occupying privileged positions in multiplex networks.</p> <ul style="list-style-type: none"> • Actors occupying central positions in the commercial network and in multiple competing sustainability programmes (outside Nespresso) were found to be able to exert a higher level of power in the Sustainability Network (Nespresso AAA Programme). • Actors occupying central positions in the Personal Network appeared to have exerted more influence in the creation and definition of the AAA Programme. <p>Implication: The findings of the research contradict literature that states that governance mechanisms evolve from formal to informal as the relationship evolves. The network in the research initially relied mostly on informal mechanisms of coordination. As the relationship evolved, formal mechanisms were introduced, not to deal with misunderstandings and conflicts or to rebalance the relationship but rather as a way to facilitate sense making, increase efficiency and set the basis for expansion of the programme.</p> <p>Implication: The research provides empirical support to the theory that pre-existing multiplex relationships can influence the choice of partners in the creation of new networks. It also supports the role of interpersonal relationships influencing inter-organizational linkages and, in turn, these inter-organizational linkages influencing new personal relationships.</p> <p>Proposition: In conditions of uncertainty, flexible conditions and the use of informal governance mechanisms supported by trust facilitate a search and experimentation</p>	<p>Section 1.9.2, Section 3.7 Section 4.7.1</p>

Question	Research Findings, Implications and Propositions (Theory and Practice)	References
	<p>process.</p> <p>Proposition: Research extends the relationships between structure position and power to include opportunities available to actors occupying strategic locations in multiplex networks.</p>	
<p>How and why does network structure evolve over time?</p>	<p>Research findings: Structure evolution is influenced by context (uncertainty, isomorphism, multiplexity), complexity (size, differentiation, centralization) and managerial action.</p> <ul style="list-style-type: none"> • Network growth: From 11 linked organizations in 2003 to 37 by 2007, ties grew from 25 to 103 during the same period. • Network complexity increased by size, increased differentiation and decreased centralization • As the lead organization, Nespresso managed the formal communication linkages between organizations and re-structured the network to promote efficiency. <p>Implication: The network became more complex over time as the number and differentiation of organizations increased and centralization around the focal organization decreased.</p> <p>Implication: The focal organization attenuated the impact of increased complexity by introducing coordinating nodes that centralized portions of the network organizations around them.</p> <p>Implication: The research provides empirical support to the theory that power opportunities are likely to be higher for actors occupying central positions in a network.</p> <p>Proposition: Network complexity is influenced by network size, the degree of differentiation among actors, the level of inter-relationships and the level of centralization of relationships in the network.</p> <p>Proposition: Network managers in focal organizations can reduce complexity in a network by introducing or managing nodes that re-centralize relationships towards these nodes.</p>	<p>Section 4.7.2, Section 4.7.3</p>
<p>How and why do governance mechanisms evolve over time?</p>	<p>Research findings: Governance mechanisms evolved to include more formal mechanisms to provide clarity, increase efficiency and allow growth.</p> <ul style="list-style-type: none"> • Formalization of governance mechanisms associated with a need to increase number of parties involved, enable measurement of identified specific objective and to bring clarity to current and new actors involved in the relationship. • As collaboration developed to a more structure and more comprehensive programme, governance mechanisms were found to co-evolve with an increased specificity of objectives and increased complexity. <p>Implication: The findings of the research contradict literature that states that governance mechanisms evolve from formal to informal as the relationship evolves. The network in the research initially relied mostly on informal mechanisms of coordination. As the relationship evolved, formal mechanisms were introduced, not to deal with misunderstandings and conflicts or to rebalance the relationship but rather as a way to facilitate sense making, increase efficiency and set the basis for expansion of the programme.</p>	<p>Section 3.7</p>

Question	Research Findings, Implications and Propositions (Theory and Practice)	References
	<p>Proposition: Formalization of governance mechanisms at a later stage in a relationship can promote clarity and efficiency, and facilitate expansion of the scale of collaborative activities.</p>	
Implications for practice	<p>Implication: Mapping existing relationships of potential partners with the organization or with other organizations can provide valuable input for identification and suitability of potential partners in the formation of new networks.</p> <p>Implication: By understanding the nature of the network and the objectives pursued, network managers can influence the size and structure of the network and target the type of actors that are more adequate at different phases of the relationship.</p> <p>Implication: Managers can actively restructure the formal relationships in a network to increase its efficiency and reduce its complexity.</p> <p>Implication: Managers can structure the formal relationships in a network to enhance or limit the power of personal or other multiplex networks.</p> <p>Implication: The governance mechanisms of a network should be aligned with the goals, the nature of the network and the organizations involved. As these evolve, the coordination mechanisms should also evolve.</p>	Section 3.8, Section 4.8

An overall objective of the research was to provide an opportunity to further develop theory and inform practice in a mutually beneficial and enhancing process, ultimately contributing to informed choices by managers in the field, supported by relevant theory development. In this direction, an overall summary of the contributions to both theory and practice is presented in Table 1-6.

Table 1-6: Summary of contributions to theory and practice

Area	Theoretical contributions	Contributions to practice
<p>Network governance dynamics</p>	<p>Challenged: ‘Relationships evolve from higher use of formal governance mechanisms towards increased use of informal mechanisms as trust, confidence and commitment increase over time’ (Doz, 1996; Ring and Van de Ven, 1994; Inkpen and Currall, 2004). Formal governance mechanisms were introduced in the case studied even when trust and commitment were increasing (Project 2).</p> <p>Added: In conditions of uncertainty, flexible conditions and the use of informal governance mechanisms can facilitate a search and experimentation process (Project 2).</p> <p>Added: Formalization of governance mechanisms at a later stage in a relationship can promote clarity and efficiency, thus facilitating the expansion of the scale of collaborative activities (Project 2).</p>	<p>Extended: Most of the practitioner guidelines are today based on dyadic relationships or inter-firm networks. The research extends this to address issues involved in creating and managing sustainable sourcing networks (Project 2).</p> <p>Added: Definition of governance mechanisms should not be a one-time activity. They should be aligned with the goals, the nature of the network and the organizations involved. As these evolve, the coordination mechanisms should also evolve and they can be used as mechanisms to respond to changes in context, or to stress-specific objectives in the relationships such as efficiency or creativity (Project 2).</p>
<p>Network structure dynamics and multiplex relationships</p>	<p>Supported: Pre-existing multiple relationships influence the choice of partners and the initial network structure in an exploratory type of network (Project 3).</p> <p>Extended: Network structure can be actively modified to mitigate undesired consequences of complexity as the network becomes decentralized (Project 3).</p> <p>Extended: Power can be derived from occupying central positions in a network (Freeman, 1979). It can also be derived from occupying central positions in multiplex/related networks (Project 3)</p>	<p>Challenged/Extended: Managers don’t necessarily start a network with a ‘clean sheet of paper’ and a structured process of partner identification and selection as suggested in much of the practitioner literature. Mapping existing relationships of potential partners with the organization or with other organizations can provide valuable input for identification and suitability of potential partners in the formation of new networks (Project 2).</p> <p>Extended: Mapping’ relationships in the network as well as in the parallel networks (ex. friendship, advice networks, affiliations with competing activities) can also provide an understanding of possible sources of power. Managers can structure the formal relationships in a network to enhance or limit the power of personal or other multiplex networks (Project 3).</p> <p>Extended: Managers can actively restructure the formal relationships in a network to increase its efficiency and reduce its complexity</p>

1.12 Epilogue – Nespresso's Programme after 2007

The period covered in the research ended in October 2007. Though outside the scope of this study, certain events that occurred after this date can provide a base for additional reflections on the challenges and opportunities of multi-stakeholder initiatives and potential applications of the conclusions of this research.

A new CEO was appointed in August 2007. The second stakeholder forum already planned for November 2007 was an important event to gauge the level of interest and support that the sustainability programme would face under the new leadership. The forum offered an opportunity to reflect on multiple aspects of the programme and conclusions from multiple initiatives, including the preliminary conclusions of this research that were presented and discussed among participants, facilitated by the lead consultant who had been instrumental in the launch and first two phases of the initiative.

Following this event, a new multi-stakeholder consultation was undertaken to assess the possibility of extending the sustainability initiative beyond the sourcing area and applying it to other areas in the company. The approach favoured learning from the past experience in developing the AAA Sustainable Quality Programme and was led by a newly appointed Director in charge of Sustainability and the lead consultant. I was also invited to contribute to the process based on the findings of this research. The consultation and planning process culminated in the announcement in June 2009 of the 'Ecolaboration Strategy', thus consolidating and extending Nespresso's sustainability efforts in coffee, capsules and machines, together with its overall operations, into a single concerted programme (Nestlé Nespresso, 2009). Multi-stakeholder cooperation was emphasized as a key element of the expanded strategy and the programme extended partnerships to these new areas of operation by establishing initial collaboration agreements with aluminium materials producers and IUCN, a non-governmental organization involved in conservation efforts.

But growth had not gone without difficulties and new challenges in the original AAA Sustainable Quality Network arose. The introduction of formal mechanisms of coordination was welcomed by most suppliers, but it imposed new 'rules of the game' to some of the original actors who now had to go through all the 'formal' channels that slowed down communication and made them feel less integrated and communicated with Nespresso. The ability of these suppliers to adapt was also challenged by the scale of operations. As the programme moved to multi-locations and to new continents, suppliers with the ability to play in multiple locations were at an advantage as this simplified Nespresso's coordination requirements. Players that were adaptable and flexible in an exploration stage could face difficulties when the expansion and efficiency stage arrived. With a number of challenges, the programme needed to continue re-inventing itself beyond 2007, re-evaluating the suitability of governance mechanisms, the structure of the network and the role of the different actors. This process is currently underway and future research would benefit from integrating this next 'phase' and comparing it with the two analyzed in the present study.

1.13 Future research directions

The findings, conclusions and propositions to theory and practice of the research suggest a number of possible paths for extending the research and contributing to build theory. Three specific areas of extension have been identified: a) deepening the research on the selected case study, b) extending the 'border' of the research to incorporate industry considerations, and c) replicating the study based on theoretical sampling.

The Nespresso AAA Sustainable Quality Programme research could be expanded to incorporate concepts that were identified as important in the case and presented in the literature, but not explored due to constraints imposed by the research process and timeline. This study denoted linkages as binary elements, i.e. linkages were treated as either present or absent. A valuable extension would be to incorporate measures for the magnitude of relationships. In particular, in the Commercial Network there were wide differences in the size, geographical coverage and business potential of the various relationships. Smaller organizations could have been found to be more flexible and accommodating in an exploratory type of network but large actors could obtain more leverage through their scale of business.

The concept of alternative and mixed sources of power could also be further explored. In this research, the study of sources of power was mainly focused on power derived from occupying a specific position in the network. This construct could be extended to incorporate other sources of power identified in the literature search such as resource dependence (Das and Teng, 2002; Pfeffer, 1992), relative importance (Gereffi et al., 2005) or balance of power among actors (Peck and Juttner, 2000).

Extending beyond the current 'borders' of the networks analyzed in this research and deepening the findings on the industry perspective would be a worthwhile extension of the current study. As presented in the findings of Project 2, Section 4.6.7, many of the organizations that participated in Nespresso's programme were part of other competing sustainability initiatives. Two consequences can be derived from this joint-affiliation phenomenon. The first one is that joint-affiliation facilitated information sharing and mimetic adoption of practices, supporting the view that imitation follows ties among organizations (Ahuja, 2000; Galaskiewicz and Burt, 1991; Galaskiewicz and Wasserman, 1989; Brass et al., 2004). A second consequence of joint-affiliation was the increased bargaining power that was available (and sometimes exercised) to traders participating in more than one programme. These organizations could become, in Burt's terminology 'Tertius Gaudens' or the 'third that benefits' (Burt, 1992).

The third area worth further research is replication of the case based on theoretical sampling. Although single-case studies have been deemed appropriate, and even unavoidable for in-depth network research (Eisenhardt and Graebner, 2007; Halinen and Tornroos, 2005), multiple-case analysis allows comparisons and can be valuable in theory-generating research (Miles and Huberman, 1994; Perry, 1998). Theoretical sampling could be pursued to select 'cases that are particularly suitable for illuminating

and extending relationships and logic among constructs'. Following Yin's (1994) suggestions, an additional case that produces contrary results for predictable reasons could be selected. A failed multi-stakeholder initiative would provide an opportunity to observe similarities and differences between the two cases and assess the role of governance mechanisms and multiplex networks in a different setting.

As Salk expressed, research that addresses the evolution of relationships over time has been 'often called for but rarely chosen' (Salk, 2005, p. 117). The case of Nespresso's AAA Programme highlights the potential benefits of this type of research to develop an understanding of the evolution of relationships in a network and it raises important areas for further research.

2 Project 1: Systematic Literature Review – Network and governance dynamics

2.1 Abstract

Purpose:

Integrating static and dynamic literature on networks, this Systematic Review aims to incorporate existing research on the creation and evolution of networks that can inform the following questions:

- How and why are networks created?
- How are initial governance mechanisms defined?
- How and why do governance mechanisms evolve over time?

Design/Methodology/Approach:

The Review follows the Systematic Literature Review methodology by adopting a replicable, scientific and transparent process that aims to minimize bias through exhaustive literature search of published studies, providing an audit trail of the reviewer's decisions, procedures and conclusions (Tranfield et al., 2003; Cook et al., 1997).

Findings:

By proposing a framework to integrate literature in a conceptual model, the Systematic Literature Review identified gaps in the literature that can frame further theoretical and empirical research to resolve these issues. The Review found that some areas, such as the motivations to form networks, have been extensively covered in the literature while others, such as the dynamics of governance mechanisms, have been less present or have resulted in sometimes-contradictory views on the subject.

Research implications:

The research integrated literature from multiple disciplinary areas in the vast and fragmented field of networks, integrating perspectives on alternative sources of motivation for the creation of networks. The research also contributed to the development of theory by identifying gaps and inconsistencies in the literature, namely in the treatment of uncertainty as a factor influencing the decision on governance mechanisms. Contradictions in the literature also resulted in the research challenging the view that a positive evolution of a relationship must entail governance mechanisms moving towards the use of more informal mechanisms and less formal ones.

Practitioner implications:

The research integrates normative papers that provide advice on the conditions in which creation of a new network is merited and the context factors that should be analyzed in the creation of such a relationship. Further, it integrates guidance on the selection of partners and of appropriate governance mechanisms.

2.2 Introduction

In an increasingly globalized and fast-changing environment, inter-organizational networks have become an attractive option for firms, public sector agencies and other organizations seeking to access resources, integrate supply chains, influence stakeholders and undertake ambitious programmes. But alongside the opportunities they offer, their challenges and shortcomings have also become increasingly evident. As expressed by Huxham and Vangen:

...Seeking collaborative advantage is a seriously resource-consuming activity so [it] is only to be considered when the stakes are really worth pursuing. Our message to practitioners and policy makers alike is *don't do it unless you have to* (Huxham and Vangen, 2005).

Failure rates of 60-70% (Hughes and Weiss, 2007) suggest that establishing network relationships is a difficult undertaking. Still, this hasn't acted as a deterrent. The number of corporate alliances has been estimated to be increasing by about 25% a year, and to account for almost a third of many companies' revenue and value (Hughes and Weiss, 2007). Beyond inter-firm collaboration, cross-sector networks (involving government, business and nonprofits) are also increasingly taking a larger role in tackling difficult public-private challenges (Bryson et al., 2006).

If failure rates are still unacceptably high but networks continue to be a preferred mechanism for organizations seeking to pursue their strategies, what can be done to increase their probabilities of success? Are there guidelines that can support managers in the selection of partners, negotiation of agreements or implementation of these agreements? Are there tools or principles that can help organizations to design better relationships? Or is the initial design of a relationship one more in a series of processes that impact the evolution of a network over time?

Among practitioners and academics there is a shared and widespread belief of the importance of the initial design of a relationship as a key determinant of its success. The conditions leading to the relationship, the initial negotiation, the structuring of activities, roles and resources, and the setting up of appropriate governance mechanisms have been highlighted as critical decisions concerning the initial design of a network. Much of the network literature does indeed focus on the factors and motivations leading to the creation of networks (Oliver, 1990; Das and Teng, 2000; Williamson, 1979; Williamson, 1985; Doz et al., 2000) and the appropriate activities and governance mechanisms (Grandori and Soda, 1995; Harland et al., 2004; Williamson, 1979; Heide and John, 1992) that need to be set up in the initial phase of a relationship.

Much of this literature points towards network design happening at the beginning of a relationship as influencing how the relationship unfolds over time, as well as the results eventually achieved (or not) by the network. However, some researchers have pursued an alternative view of relationships that places an emphasis on the evolution of these conditions over time alongside the initial conditions. The stress is placed on

the dynamics of the relationships arguing that ‘managing the relationship over time is usually more important than crafting the initial formal design’ (Doz and Hamel, 1998, p. XV) and that ‘firms make governance decisions in alliances not only at the formation stage but [also] after they have been set up’ (Reuer and Ariño, 2002, p.48).

Integrating the static and dynamic literature on networks, this review aims to incorporate existing research on the creation and evolution of networks that can inform the following three research questions:

- How and why are networks created?
- How are initial governance mechanisms defined?
- How and why do governance mechanisms evolve over time?

By examining the literature on factors influencing the creation and evolution of relationships and integrating their views on motivations, network conditions and governance mechanisms, this review aims to put forward a model to study such relationships over time, and in particular to identify determinants of initial governance decisions and of post-creation changes in these mechanisms.

After this introduction, Section 2.3 presents a definition of networks and governance mechanisms, two key concepts used in the remainder of the document. Section 2.4 introduces the literature reviewed as part of the initial doctoral research prior to this Systematic Review, which served as the basis for an initial conceptual model that is presented to be used as a guide in this review. Section 2.5 then outlines the methodology that was used in undertaking the Systematic Review, identifying the main sources of information and the search strategy utilized. This is followed by Section 2.6, that provides a descriptive overview of the documents that were reviewed and by Section 2.7 that provides a thematic analysis. This analysis covers the main findings on the subjects studied integrating concepts from the dynamic and static literature on the role of context and motivations, negotiation of conditions and governance mechanisms in networks, evolution and/or re-negotiation of governance conditions and factors identified in the literature as enhancers or inhibitors of network relationships. Section 2.8 synthesizes the evidence and identifies relevant gaps in the literature concerning creation and evolution of networks. It also addresses several limitations of the study and identifies areas for further research. It then proposes a revised model that can be used in further research to explore these gaps. Lastly, Section 2.9 summarizes the conclusions of the review by assessing implications for practitioners and academics.

2.3 Definitions and common typologies

The subject of networks has attracted great interest among academics and practitioners (de Rond and Bouchikhi, 2004; Gulati and Zajac, 2000), leading to a vast and rich body of literature by academics in the sociology, organizational theory, political economy and management fields. Such involvement, however, has also

brought multiple definitions, views on what constitutes a network and what governance mechanisms mean in this context. As these concepts are central to this review, this section introduces definitions of networks and of governance mechanisms that will be used later in the document. A complete set of definitions used in the Systematic Review can be found in Appendix 6.1.

2.3.1 What is a network?

Terms such as collaboration, co-operation, alliances, inter-organizational relationships and networks are used for similar purposes by different streams of literature to denote the sharing of certain resources and capabilities to achieve a joint outcome across organizations. In a broad sense, networks can be described as 'relatively enduring transactions, flows and linkages that occur among or between an organization and one or more organizations in its environment' (Oliver, 1990, p. 241). Grandori and Soda (1995) offer a more specific definition describing a network as 'a mode of regulating interdependence between firms which is different from the aggregation of these units within a single firm and from coordination through market signals and which is based on a cooperative game with partner specific communication' (Grandori and Soda, 1995, p. 184-85).

For purposes of this review, I define inter-organizational networks as relatively enduring relationships established between an organization and one or more organizations in its environment and involving the sharing of information, resources, activities or capabilities.

In this broad definition of networks, the term encompasses a wide range of types of relationships. Alternative typologies of networks have been proposed in the literature using different variables related to the field of study. Management literature, for example, distinguishes equity vs. non-equity based relationships (Gulati, 1995a; Thorelli, 1986), while network theorists, on the other hand, apply network structure terminology to describe relationships and defining networks by variables such as centrality, the degree to which the firm has a strategically important position in the network (Freeman, 1979), the composition and positioning of the ties among firms (Baker, 1990) and the density, multiplexity and reciprocity of ties among actors (Achrol, 1997).

Four main drivers found in the literature to classify relationships are: 1) by nature of the relationship: vertical or horizontal; 2) by equity ties: equity or non-equity; 3) by type of organization: single (private or public) sector vs. cross sector; 4) by the structure of the resulting network. A review of the variables used in multiple typologies of networks is included in Appendix 6.2. In addition to these definitions, a complete set of terms used in this Thesis can be found in Appendix 6.1.

2.3.2 What are governance mechanisms?

One interpretation of the term governance refers to the patterns of interaction in exchanges and relationships among organizations or ‘alternative institutional modes for organizing transactions’ (Williamson, 1979, p.234). Research related to this definition of governance focuses on identifying the type of relationship most suited for particular circumstances and objectives. This can be, for example, the distinction between equity or non-equity based, joint venture or partial acquisitions. For purposes of this research, these decisions are considered alternative network forms rather than governance structures, and the term is used in a narrower sense to refer to the actual mechanisms used to coordinate activities and resources among actors in a network.

This research considers governance mechanisms to include a variety of means of coordination employed to sustain network cooperation (Grandori and Soda, 1995), including formal mechanisms such as the specific set of contracts and obligatory arrangements (Ellram and Edis, 1996), the legal structure used to govern the relationship (Nassimbeni, 1998); and informal mechanisms such as the implicit norms of behaviour (Heide and John, 1992; MacNeil, 1981), conventions or standards (Ponte and Gibbon, 2005) and pledges (Anderson and Weitz, 1992).

2.4 An initial research model

Prior to carrying out this Systematic Review of Literature, doctoral research included a ‘Scoping Study’⁵ and an opportunity to present an initial research model at the Logistics Research Network Conference in August 2007 (Alvarez and Wilding, 2007). The Conference paper, included in this thesis as Appendix 8, provided an overview of literature in the emerging sustainability field related to multi-stakeholder networks and an overview of management literature on this topic. A broad review of literature in the field was also completed as part of the Scoping Study, and influential streams of literature were identified and summarized in a literature chronological overview, reproduced in Appendix 6.3.

During the literature review process conducted as part of the above referenced documents, several models describing the creation and evolution of networks were identified, and these were used as the basis for constructing an initial descriptive model of network evolution.

In a seminal article in the dynamic perspective literature, Ring and Van de Ven (1994) observe that an alliance evolves through iterative processes of negotiations, commitments and executions, each of which is assessed by the network actors in terms of efficiency and equity. This dynamic view of relationships frames networks as an iterative process, with formal legal and psychological contracts being shaped by actions and interpretations of the participating organizations. Thus, ‘just as an initial

⁵ The integrated literature chart and other relevant sections from the Scoping Study have been included in this Thesis. The document as a whole is available upon request.

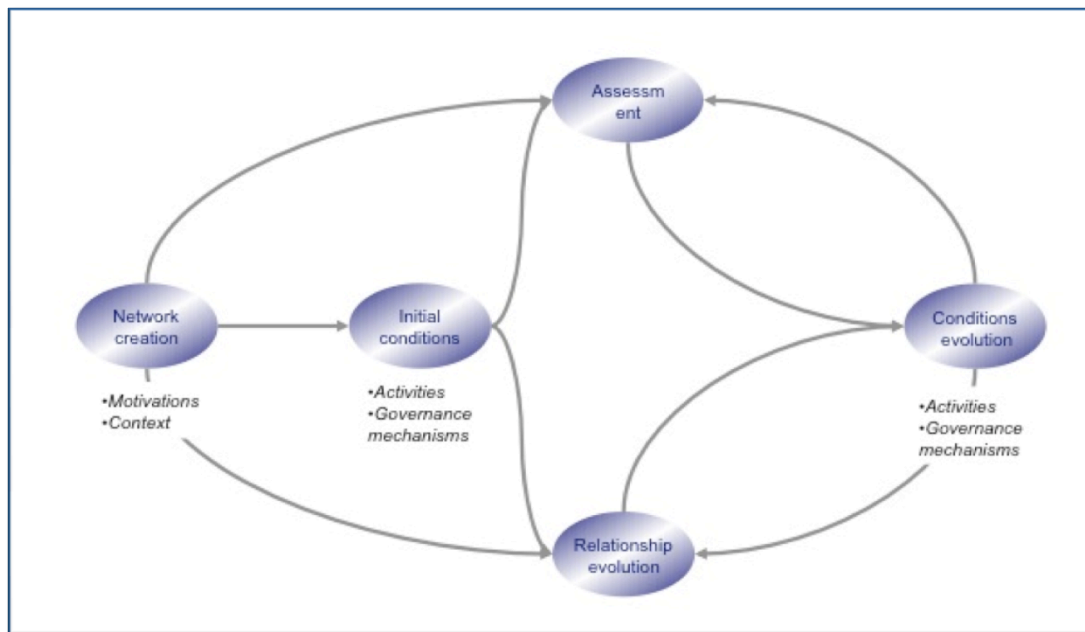
structure of safeguards establishes a context for interparty action, so also do subsequent interactions reconstruct and embody new governance structures for the relationship' (Ring and Van de Ven, 1994).

In the supply chain literature, Lambert, Emmelhainz and Gardner (1996a) also propose a dynamic view of buyer-seller relationships. Their model distinguishes a creation phase influenced by internal and external drivers and facilitators that leads to the definition of components of the relationship – including activities and processes – and a set of outcomes which in turn become an input to a decision to adjust the components of the relationship.

Ariño and de la Torre (1998) integrate Ring and Van de Ven's model, Doz's (1996) view of the impact of initial conditions on the evolution of relationships, and the role of context factors and external shocks.

Though these models will be explored in depth in Section 2.7.8 a first integration of elements presented in both the static and dynamic network literature is introduced here in Figure 2-1. This model was used to create an initial search protocol of the Systematic Review of Literature and it also served as a framework to organize and present the data uncovered by the research.

Figure 2-1: Initial conceptual framework to study network evolution



The initial conceptual model includes a creation phase in which the decision on governance mechanisms and activities of the network is influenced by actor-specific, relationship and contextual variables. It then incorporates an execution and renegotiation phase leading to possible modifications in governance mechanisms and

activities. This model is used to frame the review of the literature to address the questions that have been proposed for the research.

2.5 Systematic Review: Rationale, Search Strategy and Data Extraction

2.5.1 Why a Systematic Review?

Management research has been frequently characterized as a very fragmented field, with different subfields focusing on different questions and using distinct methodologies to carry out research (Tranfield and Starkey, 1998; Baligh et al., 1996, cited by Denyer and Tranfield, 2006). The literature on networks and inter-organizational relationships has been particularly referred to as broad, fragmented and heterogeneous, with multiple fields of knowledge contributing to the topic, each from a different perspective (Barringer and Harrison, 2000; Oliver, 1990).

Integrating the vast literature around the questions that guide this research was therefore a critical step to identify relevant gaps in the literature and to guide future field research. Because of the increasing interest and participation of companies in these relationships it could also, as Denyer and Tranfield (Denyer and Tranfield, 2006) suggest, be useful for practitioners by providing ideas, illustrations and recommendations for practice.

A number of tools can be used to integrate the literature, including traditional literature reviews, systematic literature reviews and tools adapted to qualitative evidence such as narrative synthesis and meta-ethnography (for a review refer to Denyer and Tranfield, 2006). Systematic Review distinguishes itself from other types of literature review by adopting a 'replicable, scientific and transparent process that aims to minimize bias through exhaustive literature search of published and unpublished studies and by providing an audit trail of the reviewer's decisions, procedures and conclusions' (Cook et al., 1997, cited by Tranfield et al. 2003). Originally based on the medical field and as a methodology to integrate findings from quantitative studies, the methodology offers the potential of comprehensiveness and comparability.

Its rigor and replicability are important attributes of this methodology and it can offer a useful guide to the integration of existing research by specifying a search strategy, a selection criteria and a data reduction methodology. To accommodate for the heterogeneity in the methodologies of reviewed articles, the integration of findings in this review also includes elements of narrative analysis where 'narratives from individual studies are built into a mosaic or map' (Hammersley, 2001), and realist synthesis where the theories underpinning a study are identified and the findings of different studies are translated into terms that can allow comparison across them, but where underlying causation is reckoned to be contingent on specific circumstances (Pawson, 2001).

2.5.2 The Review Process

As mentioned in the previous section, the rigor and replicability of the Systematic Literature Review are important attributes of this methodology, offering a useful guide to the integration of existing research by specifying a search strategy, a selection criteria and a data reduction methodology.

In accordance with the methodology, all steps in the search were defined and documented to support rigor and traceability. These steps included: setting up an advisory panel, specifying a search strategy, identifying relevant data sources, executing the search, screening the results and, lastly, analyzing the content of these papers relative to the research questions.

Panel advice

A research panel gave advice at various key points in the review. As Table 2-1 shows, the panel was composed of academics, information specialists and practitioners. Academic panel members reviewed two drafts of the Systematic Literature Review protocol and one previous draft of this document. They gave recommendations on search terms to use and on approaches to determine which papers to include in the review. Dr. Colin Pilbeam was very supportive in providing recommendations in terms of methodology, selection criteria and data synthesis. Professor Richard Wilding and Professor Hugh Wilson provided useful comments and facilitated models of Systematic Reviews to use as guidance. Ms. Heather Woodfield provided advice on constructing search strings, utilizing software databases such as ProQuest (ProQuest LLC 2009) and EBSCO (EBSCO Industries 2009), the use of bibliographic support tools such as Refworks (Refworks 2007), and how to construct an electronic spreadsheet that could be utilized to collect key data. Mr. Juan Carlos Ardila, a coffee trader and a member of a sustainable sourcing stakeholder network that was analyzed as part of the field research, also reviewed the search terms to ensure that the language used captured specific terms used by the trade. The Cranfield website portal on Systematic Review was also used throughout the process (www.cranfieldonline.com) as a detailed step-by-step methodology guide.

Table 2-1: Panel members consulted in the Systematic Review Process

Person	Title	Organization
Prof. Richard Wilding	Professor of Supply Chain Risk Management, Thesis Supervisor	Cranfield School of Management
Prof. Hugh Wilson	Professor of Strategic Marketing, Panel Chair	Cranfield School of Management
Dr. Colin Pilbeam	Senior Research Fellow and Director PhD Programme, Systematic Review Specialist	Cranfield School of Management
Ms. Heather Woodfield	Information specialist	Cranfield University

Person	Title	Organization
Mr. Juan Carlos Ardila	Managing Director Coffee trader representative in Nespresso's AAA Programme and participant in Common Code for Coffee Community consultation	Cafexport (Coffee trading)

Search Strategy and data sources

A comprehensive, unbiased search has been stated as one of the fundamental differences between a traditional literature review and a systematic review (Tranfield et al., 2003).

After the Systematic Review questions were agreed upon in consultation with the Panel, the next step of the review was to identify all relevant sources of literature. To do this, four processes were initiated: a) identification of the main keywords used in the different streams of literature to be built into research strings in three academic search databases; b) review of the references used in previous doctoral research documents; c) review of influential journal articles and authors in the field, and d) identification of specific articles or book sections that were considered relevant as background information or additional clarification on a specific topic.

Keyword search using databases

In addition to the papers and documents that had already been identified from previous doctoral research, three main sources of data were used for the Review. The first one consisted of the main electronic databases: Proquest (ProQuest LLC 2009), EBSCO (EBSCO Industries 2009) and Social Sciences Citation Index (SSCI) (Thomson Reuters 2009). ProQuest and EBSCO are widely used in the business research community and they are considered to be reliable and quite complete by library professionals. SSCI was also included initially with the objective of identifying relevant economic development and political science literature that may not have been covered as comprehensively by ProQuest and EBSCO.

Other data sources

Previous doctoral research in the form of a Scoping Study and a Conference paper were also used as literature sources for this review. These documents were screened using the Systematic Literature Review research questions. As a result of this process, a total of 260 (116 and 144, respectively) references were identified and included in the subsequent phases of the research.

A review of the key journals and previously identified influential authors was also carried out in parallel to the main search. Table 2-2 lists the publications and influential authors that were searched for separately in the electronic database ProQuest.

This additional step in the process also served as a triangulation of sources and the low number of additional articles that were identified via the author and publication search (only 12) suggests that the keyword search and previously authored documents had captured the most relevant documents.

Table 2-2: Related journals and influential authors research

Publications	Supply Chain Management; Industrial Marketing Management; Journal of Business Ethics; Academy of Management Review; Journal of Management; Journal of Marketing Management; Journal of Development Studies; International Journal of Operations and production management
Authors	Doz, Yves; Boddy, David; Macbeth, Douglas; Wagner, Beverly; Cox, Andrew; de Man, Reinier; Metcalf, Lynn; Frear, Carl; Overdest, Christine; Ponte, Stefano; smith Ring, Peter; Van de Ven, Andrew; Steurer, Reinhar; Burns, Tom; Gereffi, Gary; Humphrey, John; Grandori, Anna; Harland, Christine; Zheng, Jurong; Lambert, Douglas; Lamming, Richard; Blackenburg Holm, Desirée; Ingenbleek, Paul; Faulkner, R.; De Toni, A; Nassimbeni, Guido; Gray, Barbara; Hakansson, H.; Borgatti, S.P.; Emmelhainz, M.A.; Ring, P.S.; Turnbull, P; Ford, D.; Porter, Michael; Van de Ven, A.H.; Carroll, A.B; Auroi, C.; Christmann, P.; Elkington, J; Kok, A.; Nohria, N.; O'Rourke, D; Kramer, M.R.; Raynolds, Laura;

An additional source of literature was derived from cross-references in articles that had been identified through key word search or through the influential list of authors and publications. A total of 42 papers were identified this way.

Lastly, specific sections of selected papers were used as an additional source of literature. As the analysis proceeded, cross-references that addressed a specific topic of analysis or served as background on the topic were identified. After checking for quality and relevance, these findings were incorporated into the review. It is important to note, however, that the additional 133 references were reviewed only in the specific section that addressed the specific topic and not in their totality. The list of additional papers included in the review as additional specific or background information can be found in Appendix 6.4.2.

Keywords and search terms

The next step in the keyword-based search strategy was generating a set of terms to be used in the search through the selected databases. This list should be ‘both wide enough to recall a sufficient quantity of references and precise enough, in the light of information explosion, to eliminate unnecessary material’ (Duff, 1996, p.15).

The search for keywords proved to be a complex part of the process due to the wide divergence in terminology used by different areas of literature. Even in the same field, different authors employ diverse terms to refer to the same phenomena. For example, what this review defines as inter-organizational network relationships is also referred to by different authors as alliances, joint ventures, inter-firm networks, buyer-seller relationships, inter-organizational relationships, consortia and collaborative arrangements.

The keywords were searched in each of the categories covered by the initial conceptual framework (Figure 2-1) to address the areas of creation of networks, network conditions, network dynamics and factors influencing the initial and subsequent governance mechanisms. As the sustainability literature at the time was limited, it was decided to define broader keywords in this area to make the search in this area as broad as possible.

Table 2-3 lists the search terms that were considered for each category. After an initial search, a list of terms and topics that would unintentionally be captured by the search but were not relevant for this research were excluded from the final search in the relevant category.

Table 2-3: Search terms

Relationship		Motivation	Activities	Governance	Influencers	Sustainability
Area/Domain	Type					
Inter or Cross Firm Organization Sector	Relations*	Motivation	Activit*	___Mechanisms Control Governance Decision Coordination Sanction	Enhancer	Sustainb*
___ Chain Supply Demand Commodity Value	Network	Creation	Resourc*	Power	Inhibitor	Fair Trade
Supplier / Producer /Seller - Buyer / Purchas*	Alliance	Formation	Value Creat*	___ shar* Risk Resource Decision mak*	Influencer	Social Responsib*
	Partners*	Rationale	Interface		Difficult*	Ethic*
	Co?operati*	Purpose			Contribut*	
	Collaborati*				Enabler	
	Joint Venture				Barrier	
Excluding						
Channel	Merger			Electric		
Retail	Acquisition			Corporate		
Inter government	WLAN					
Knowledge	Electronic commerce					
Life-cycle	Information technology					
Stochastic	CRM					
Cross-cultural	Energy					
Consumer	Social Network					

Search strings

Search strings to be used in the electronic databases were then constructed from the selected keywords using Boolean connectors. The terms in the two columns that identify the relationship in Table 2-3 were connected using 'AND' and searched alongside each of terms included in the next five columns using 'OR' as a connector between them. Table 2-4 presents the five search strings identified for use in the databases.

Table 2-4: Search strings

	Area	Search String
1	Relationship and motivation	((inter OR cross) AND (firm OR organi?ation OR sector)) OR ((supply OR demand OR value OR commodity) AND (chain)) OR ((supplier OR producer OR seller) AND (buyer OR purchas*) AND (relations* OR network OR alliance OR partner* OR co?operati* OR collaborat* OR ('joint venture')) AND (motiv* OR creation OR formation OR rationale OR purpose) AND NOT (channel OR retail OR inter?government OR wlan OR knowledge OR life?cycle OR stochastic OR cross?cultural OR consumer OR ('social network') OR ('electronic commerce') OR ('information technology') OR merger OR acquisition OR CRM OR Energy)
2	Relationship and activities	((inter OR cross) AND (firm OR organi?ation OR sector)) OR ((supply OR demand OR value OR commodity) AND (chain)) OR ((supplier OR producer OR seller) AND (buyer OR purchas*) AND (relations* OR network OR alliance OR partner* OR co?operati* OR collaborat* OR ('joint venture')) AND (relations* OR network OR alliance OR partner* OR co?operati* OR collaborat* OR 'joint venture') AND (activit* OR resourc* OR (value AND creat*) OR interface) AND NOT (channel OR retail OR inter?government OR wlan OR knowledge OR life?cycle OR stochastic OR cross?cultural OR consumer OR ('social network') OR ('electronic commerce') OR ('information technology') OR merger OR acquisition OR CRM OR Energy)
3	Relationship and governance	((inter OR cross) AND (firm OR organi?ation OR sector)) OR ((supply OR demand OR value OR commodity) AND (chain)) OR ((supplier OR producer OR seller) AND (buyer OR purchas*) AND (relations* OR network OR alliance OR partner* OR co?operati* OR collaborat* OR ('joint venture')) AND (relations* OR network OR alliance OR partner* OR co?operati* OR collaborat* OR 'joint venture') AND ((control OR governance OR decision OR co?ordination OR sanction) AND mechanisms) OR power OR ((risk OR (decision AND mak*) OR resource) AND shar*) AND NOT (channel OR retail OR inter?government OR wlan OR knowledge OR life?cycle OR stochastic OR cross?cultural OR consumer OR ('social network') OR ('electronic commerce') OR ('information technology') OR merger OR acquisition OR CRM OR Energy OR 'corporate governance' OR electric)
4	Relationship and influencers	((inter OR cross) AND (firm OR organi?ation OR sector)) OR ((supply OR demand OR value OR commodity) AND (chain)) OR ((supplier OR producer OR seller) AND (buyer OR purchas*) AND (relations* OR network OR alliance OR partner* OR co?operati* OR collaborat* OR ('joint venture')) AND (relations* OR network OR alliance OR partner* OR co?operati* OR collaborat* OR 'joint venture') AND (enhancer OR inhibitor OR influencer OR difficult* OR contribut* OR enabler OR barrier) AND NOT (channel OR retail OR inter?government OR wlan OR knowledge OR life?cycle OR stochastic OR cross?cultural OR consumer OR ('social network') OR ('electronic commerce') OR ('information technology') OR merger OR acquisition OR CRM OR Energy)
5	Relationship and sustainability	((inter OR cross) AND (firm OR organi?ation OR sector)) OR ((supply OR demand OR value OR commodity) AND (chain)) OR ((supplier OR producer OR seller) AND (buyer OR purchas*) AND (relations* OR network OR alliance OR partner* OR co?operati* OR collaborat* OR ('joint venture')) AND (relations* OR network OR alliance OR partner* OR co?operati* OR collaborat* OR 'joint venture') AND (sustainab* OR 'fair trade' OR (social AND responsib*) OR ethic*) AND NOT (channel OR retail OR inter?government OR wlan OR knowledge OR life?cycle OR stochastic OR cross?cultural OR consumer OR ('social network') OR ('electronic commerce') OR ('information technology') OR merger OR acquisition OR CRM OR Energy)

Electronic search engines

The three databases, Proquest, EBSCO and SSCI, were then used to run searches using the identified search strings. A complication immediately identified in using the selected strings was that some databases (in this case, ProQuest) only accept a limited number of strings for each search. Breaking down the search into sub-searches resulted in a large number of articles and duplications that could not be easily eliminated. This obstacle was addressed with Heather Woodfield, the information specialist at the library, who stated that, for the time being, no solution was possible for this problem. Thus, the results from this database were discarded for the keyword search but the database was retained as a source to be used for the specific search using authors and journals.

A search using the selected strings was done in the remaining two databases. No particular timeframe was selected for the searches and the search terms were searched in titles and abstracts included in the database. Results in the natural sciences were excluded from the search and results were also restricted to scholarly journals. Table 2-5 displays the number of hits for each search string in each database resulting from the initial keyword search.

Table 2-5: Database hits per search string

	Search strings	EBSCO	Social Sciences Citation Index	ProQuest*
1	Relationship and motivation	337	375	1762*
2	Relationship and activities	486	522	1803*
3	Relationship and governance	556	298	203*
4	Relationship and influencers	667	77	1050*
5	Relationship and sustainability	117	74	269*
	TOTAL	2212	1346	5087
	Excluding repetitions within each database	1878	595	???

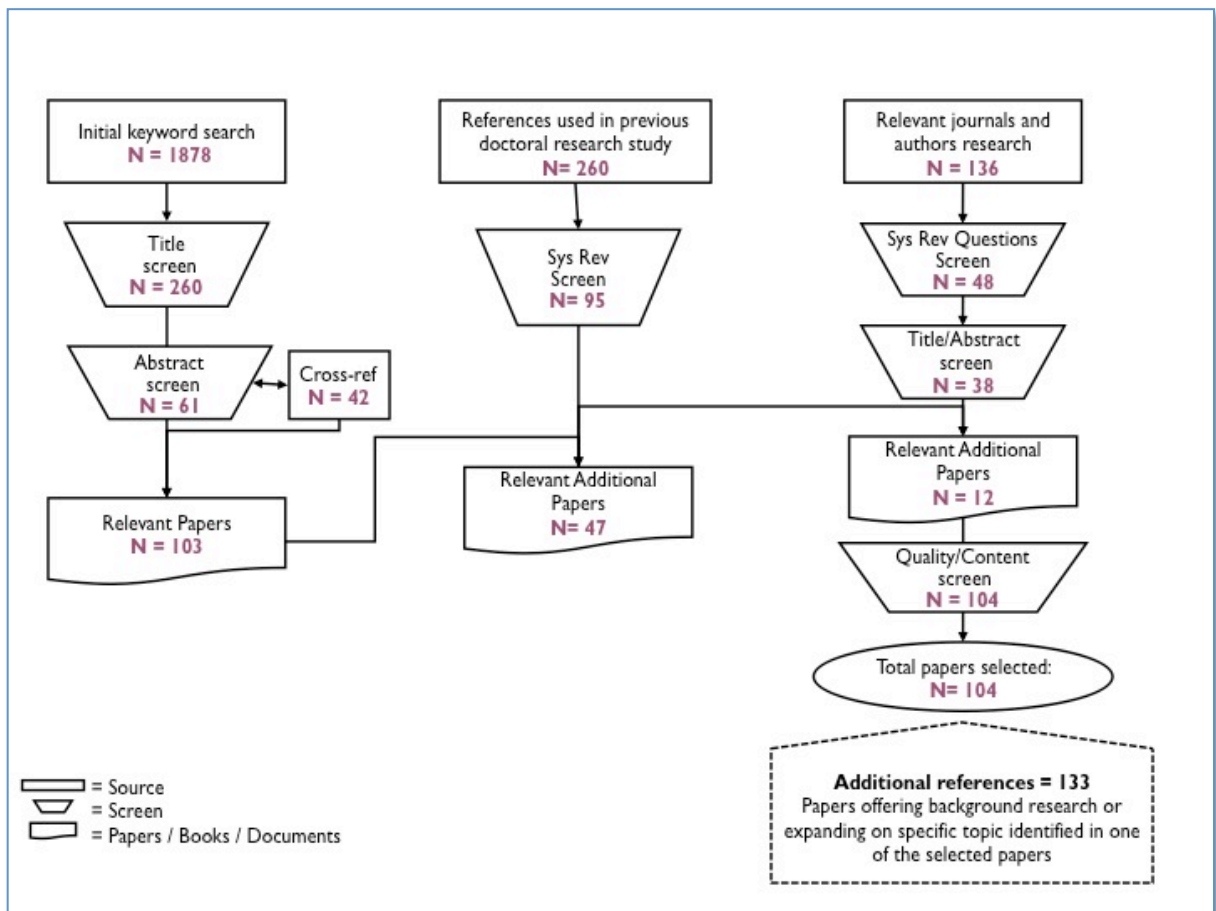
**Search had to be broken in 3 sub-searches and the searched papers could not be verified for duplications. There is probably significant overlap between the different searches.*

The total number of articles found using the EBSCO database was 2,212, and 1,346 using SSCI. There were, however, a large number of duplicates in each database. Excluding these repetitions, there were 1,878 articles identified through EBSCO and 595 through SSCI. In consultation with the panel, after a first review of the titles from the SSCI search showed a high overlap with those from EBSCO, it was decided to focus further screening on the results from EBSCO's database.

Screening Process

The next step in the Systematic Literature Review process entailed selecting papers according to their relevance and their quality. This was done in three stages, illustrated in Figure 2-2, and consisted of a review of the titles, an abstract review and, for the remaining papers, a full paper review. At each step, inclusion and exclusion criteria were predetermined to ensure transparency and replicability of the process.

Figure 2-2: Systematic Review Screening Process Overview



The keyword search using the EBSCO database and eliminating duplicates resulted in 1,878 documents, while searches from the other identified sources resulted in 260 references identified from previous doctoral research and 136 from the relevant journal and author research, thus totalling 396 additional documents. The titles and then the abstracts of the searched documents were screened for relevance following the inclusion and exclusion criteria. The articles, book chapters and other documents that were identified from the Scoping Study and other authors' academic writing were maintained for full text analysis.

Title and abstract review

The title and abstract review was done using broad inclusion and exclusion criteria, reproduced in Table 2-6. Papers were included in the full review when they had networks or inter-organizational relationships as a main theme and when they included references to multi-sector relationships. No restriction was placed on the time of publishing or whether the paper was an empirical or theoretical one. Documents were excluded if they referred to the service or retail sectors as the study focused on sourcing

networks and papers related to physical products were considered more appropriate to the issues of an agricultural sourcing network. Editorial pieces were read and considered as sources of new references but were not included as such in the review. All the documents that were identified were in English. Though the data search engines can identify documents in other languages and the review had specified Portuguese, Spanish or French as possible languages, all documents identified by the web-searches were in the English language.

Table 2-6: Inclusion and exclusion criteria for document titles and abstracts

Inclusion criteria	Rationale
Papers have to have networks or inter-organizational relationships as a main theme	The focus of the research is to study networks and network relationships
Papers include reference to multi-sector relationships	The research focuses on relationships involving corporations, NGOs and other actors
Selection of papers will not be limited to a particular time frame	The field has developed significantly since the 1980s but seminal papers date from much earlier
Theoretical and empirical studies, either qualitative or quantitative papers	Different approaches have contributed to the research area

Exclusion criteria	Rationale
Papers relating to service sectors	Since the research focused on sourcing networks, the topic is better fitted to agricultural or industrial sectors
Papers related to relationships with consumer or with retail channels	The research is focused on general network relationships not on individual consumers or retail channels
Papers related to topics where the focus is not on network relationships	A vast body of literature addresses the topic tangentially but the focus is not on the relationships between organizations
All studies or publications in any language other than English, Spanish, French, Portuguese, Italian	These languages are the only ones that the researcher can read
Editorial comments	Editorial articles and comments on papers were only used as reference to the identified articles and not specifically reviewed

Due to the large number of articles, the review was done in two different steps, with a first screen done on the titles and a second one reviewing the abstracts. Of the 1,878 documents identified in the keyword search, 260 were maintained after the title screen and 61 articles remained after the abstract reviews. The reasons for exclusion after the keyword search were documented and a summary is included in Table 2-7. Likewise, 38 articles were maintained from the relevant publication search. As for the papers identified by the previous doctoral research, they were screened using the Systematic Review questions and this resulted in 95 additional papers that were considered for full paper review.

Table 2-7: Documents excluded after title and abstract review

Exclusion criteria	Specific	Title Review	Abstract review
Initial number of documents		1,878	260
Service Sector	Real Estate	47	3
	IT, e-commerce	165	5
	Financial	137	4
	Energy	53	0
	Other services	119	5
Consumer	Consumer, channel	91	1
Employees	HR / Intra-organization	124	1
Inter-organizational networks not focus	Ecology	18	3
	Biotech	3	3
	Performance	68	8
	Manufacturing, logistics	278	40
	Agility, flexibility, innovation	51	19
	Transaction, short term, outsource	0	30
Editorial	Editorial articles	76	3
Other	Population, psychology, legal and repeat	124	43
	Economics / Politics	264	31
Total # of articles discarded		1618	199
Articles retained		260	61

Full paper review and quality assessment

The next step in the process was to review in detail the 162 papers that were retained after the Abstract Review (61), cross-referenced (42), selected from previous doctoral research (47) and identified through relevant author and journal research (12). The quality of the papers was then reviewed. Their conceptual, empirical and methodological merit was assessed using the Selection criteria illustrated in Table 2-8.

Table 2-8: Selection criteria for full text papers

Type of research	Selection criteria
Conceptual/ Theoretical	Paper includes theories or framework that apply to the creation and operation of network relationships
	The paper presents or defines its contribution to existing knowledge
	The paper claims its conclusions can be generalized to a broader context
Empirical	Clear definition of methodology
	Clear description of sample selection criteria and data collection methods
	Clear conclusions from the data and implications for further research
Methodological	Clear and consistent assumptions
	Review of methodologies adopted earlier in addressing the same question
	Justification for the methodology used

Of the 162 documents reviewed, only 11 were eliminated due to their poor quality, but an additional 45 were discarded at this point because the topic was not significantly related to the topic of the review or was covered only in a very tangential way. Some of the latter ones were, however, still considered for specific sections in the review and referenced accordingly as part of the additional 133 references. This last screen resulted in 104 documents that were finally included in the full review and from which data on the topics covered in the analysis were extracted. The complete list of these documents, the year of publication and their source are included in Appendix 6.4.

Data extraction

To facilitate data synthesis, a data extraction form was designed in an electronic spreadsheet to capture the main areas of the initial research framework covered in each document. The data extraction form, reproduced in Table 2-9, included nine fields covering information on bibliographic and methodology aspects, and nine additional categories covering the questions on network relationships guiding this review.

Table 2-9: Data extraction form

Area	Data
Bibliographic	Author
	Author's institution geography
	Year
	Title
	Journal / Book source

Area	Data
Methodology	Type of paper (Conceptual, Empirical)
	Method for data collection
	Sample
	Geography
Content	Abstract
	Motivations
	Context
	Structure / Activities / Elements
	Governance Mechanisms
	Influence Factors
	Impact
	Relationship model
	Process / Dynamics

An example of the contents included in the excel spreadsheet (the first 10 documents ordered alphabetically by author) can be found in Appendix 6.5⁶.

Data Synthesis

The information included in the spreadsheet was analyzed and the conclusions were initially integrated by topic. The framework presented in Figure 2-1 in Section 2.4 was used to integrate the findings of the Review. In the spirit of what Pawson (2004) suggests an important aspect of data synthesis is the contribution to framework building through the identification of patterns that ‘produce an explanatory whole that is greater than the sum of its parts’.

2.6 Descriptive Analysis

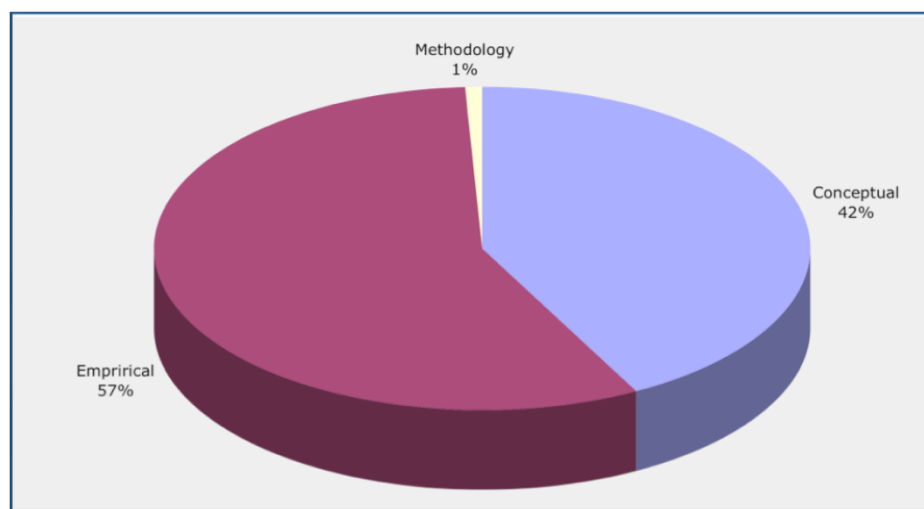
To facilitate locating the review in its context, the following section provides an overview of the type of studies that were included in the documents reviewed in full. It also groups the documents by the journal they were published in or the date of publication if they were published as a book section. This is followed by a summary of the number of journals that addressed each of the review topics.

2.6.1 Types of studies included

Among the 104 documents reviewed in full, a majority was empirically based, with 56 documents (57% of the total) reporting on an empirical research. As Figure 2-3 illustrates, a further 46 documents were conceptual or theory papers (42%), and the remaining paper (1%) was methodological in nature.

⁶ The full review (95 pages) has not been included as an Appendix but is available upon request in printed or electronic format.

Figure 2-3: Articles by type of paper



2.6.2 Types of journals

Of the 104 documents selected to be included in the analysis, 97 represented academic articles published in journals, while 7 were books or book chapters. The articles represented a wide variety of publications. As multiple literature fields converge in the area of network relationships, it is not surprising that the sources thereof are as varied as they were. Nevertheless, as Table 2-10 illustrates, management literature was the area best represented with 19 articles, and industrial marketing the second most frequent with 7 articles.

Table 2-10: Articles reviewed by source

Publication	Number of articles	Percentage
Academy of Management Review	12	12.4%
Strategic Management Journal	8	8.2%
Industrial Marketing Management	7	7.2%
Journal of Marketing	5	5.2%
Academy of Management Journal	3	3.1%
Administrative Science Quarterly	3	3.1%
British Journal of Management	3	3.1%
California management review	3	3.1%
Greener Management International	3	3.1%
Journal of Management	3	3.1%
Journal of Management Studies	3	3.1%
American Journal of Sociology	2	2.1%
European Journal of Marketing	2	2.1%
International Business Review	2	2.1%
International Journal of Operations & Production Management	2	2.1%

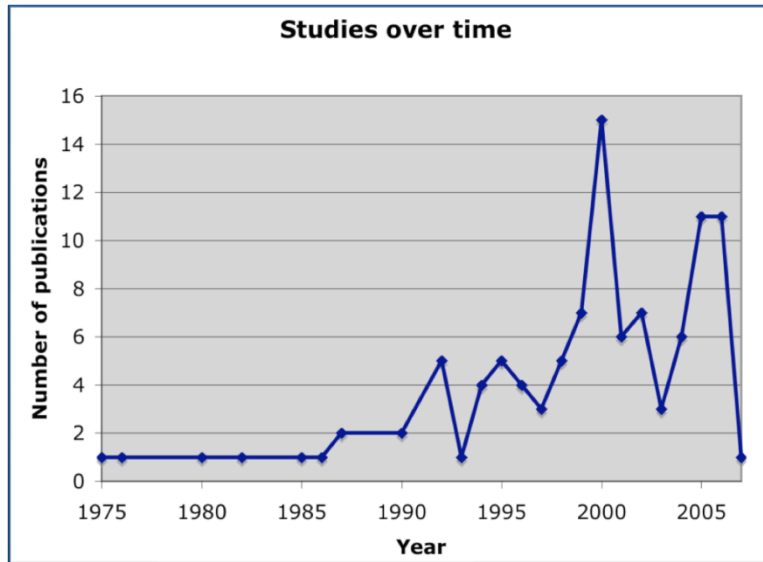
Publication	Number of articles	Percentage
International Journal of Physical Distribution & Logistics Management	2	2.1%
JMR, Journal of Marketing Research	2	2.1%
Journal of Business Logistics	2	2.1%
Accounting, Organizations & Society	1	1.0%
Agribusiness	1	1.0%
Business Ethics Quarterly	1	1.0%
Business horizons	1	1.0%
Business Strategy and the Environment	1	1.0%
Economy and Society	1	1.0%
European Management Journal	1	1.0%
European Management Review	1	1.0%
Food Policy	1	1.0%
Harvard business review	1	1.0%
Human Systems Management	1	1.0%
Industry and Innovation	1	1.0%
International Journal of Logistics Management	1	1.0%
International Journal of Retail & Distribution Management	1	1.0%
International Studies of Management & Organization	1	1.0%
Journal of Business & Industrial Marketing	1	1.0%
Journal of Business Research	1	1.0%
Journal of General Management	1	1.0%
Journal of Purchasing & Supply Management	1	1.0%
Journal of Strategic Marketing	1	1.0%
Journal of Supply Chain Management: A Global Review of Purchasing & Supply	1	1.0%
Organization Science	1	1.0%
Organization Studies	1	1.0%
Public administration review	1	1.0%
Regional Studies	1	1.0%
Relations Industrielles	1	1.0%
Review of International Political Economy: RIPE	1	1.0%
Supply Chain Management	1	1.0%
The Journal of Consumer Affairs	1	1.0%
The Journal of Economic Perspectives	1	1.0%
Total # of Articles	97	100.0%
Books, book chapters	7	
Total # of documents	104	

2.6.3 Studies over time

A large percentage of the articles reviewed had been published after the year 2000. However, articles published as far back as 1975 were identified in the research. It worthwhile to note that the electronic search engines do not catalog all historic

publications and thus, the search might not have included older issues of journals that had not been scanned and thus available in electronic format. Figure 2-4 represents the number of publications by year, showing a peak of 15 articles in 2000 and an overall increasing trend until 2005.

Figure 2-4: Articles reviewed by publication date

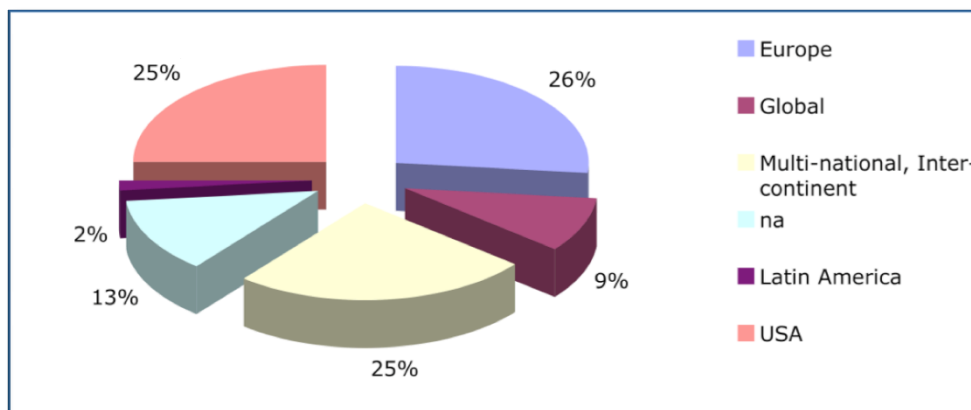


2.6.4 Studies by country

Of the 56 empirical papers reviewed, Europe and the United States were the geographies that were most predominantly covered in the research, with 15 (26%) and 14 papers (25%), respectively. An additional 19 papers (34%) used global, multi-national or inter-continental subjects, with only one paper being based on data captured in Latin America, and 7 papers (13%) did not specify any geographic focus.

Figure 2-5 illustrates the different geographies analyzed in terms of percentage of reviewed papers.

Figure 2-5: Articles reviewed by geographic coverage



2.6.5 Studies by topic

Of the total of 104 articles reviewed, many covered several topics. Table 2-11 identifies the number of articles that addressed each of the topics included in the review. Influence a factor, which capture views on drivers for success or failure of the relationship, was the topic covered by almost half the documents reviewed. This is probably a consequence of the 'prescriptive' view with regard to the other areas covered in each article. For example, many articles covering governance mechanisms also included views on factors that contribute to more or less successful governance mechanisms. As expected, the area covered in fewer articles was the process view of inter-organizational networks and the study of relationship dynamics, which was only addressed in 12 of the articles reviewed.

Table 2-11: Articles reviewed by topic

Topic	Number of articles
Context	14
Motivations	25
Structure / Activities / Elements	27
Governance Mechanisms	22
Influence factors	47
Relationship models	29
Process / Network dynamics	12

2.7 Thematic Analysis

2.7.1 Introduction

The thematic analysis section has been organized following the descriptive framework presented in Figure 2-1 (Section 2.4). It integrates literature on static views of networks, mainly as they relate to creation and governance mechanisms, and it also incorporates research from the dynamic perspective of networks.

The literature has been integrated following the elements of the framework and is presented in an integrated format in this section, following the procedure proposed by Hammersley (2001) whereby narratives from individual studies are built into a mosaic or map.

2.7.2 Network creation

Network creation is a topic extensively covered in the literature, especially as it refers to the motivations to initiate relationships with other organization. As Table 2-11 shows, 25 of the reviewed publications explored the rationale(s) for network creation, 27 addressed initial structure and activities, and 22 focused on the initial governance mechanisms. The context surrounding the creation of a network was less prevalent among the articles reviewed, but 14 of these included theory or empirical

findings on the external or relationship context and how it impacts the creation of networks.

2.7.3 Motivations to form networks

A dominant management field view to explain network creation is that associated with the Transaction Cost Economics (TCE) perspective. This theory presents efficiency as a dominant determinant of inter-organizational relationships and identifies the pursuit of efficiencies by lowering transaction costs in situations of bounded rationality, future uncertainty, limited supply of actors and risk of opportunism as the main reasons for establishing a relationship (Williamson, 1975; Williamson, 1979; Coase, 1937). In its purest form, TCE presents networks as an alternative to a market or an organizational hierarchy, one that helps the firm minimize the sum of production and transaction costs (Barringer and Harrison, 2000). Networks can reduce the costs of opportunism and monitoring that are present in market transactions (Jarillo, 1988) while at the same time avoiding the need to internalize an activity that may not be aligned with the firm's core activity or which is difficult and costly to manage (Harrigan, 1988). A variation of TCE rationale is that of benefit-cost ratio, assessing the total costs and rewards from the association versus alternatives outside the association (Dwyer et al., 1987). In this view, the partners 'perceive that the potential rewards are great enough to take the trouble, go to the bother, and expend the psychic and physical energies necessary to negotiate' (Scanzoni, 1979, p.72).

Though TCE has been widely used in the research of networks and acknowledged as an important contributor to their understanding, many authors have been critical of its limiting focus on efficiency and risk of opportunism as the main drivers to establish relationships ignoring or minimizing the role of factors such as relative power, trust and informal governance mechanisms (de Rond, 2003). TCE has also been criticized for its lack of attention to the process of creation of a network and its evolution over time (Barringer and Harrison, 2000; Salk, 2005).

Another important approach, also from the management field, is that of the Resource Based View of the Firm. In this view, the predominant questions are still, as in TCE, why organizations seek to establish relationships with each other and the impact of establishing these relationships for the organizations. In the Resource Based perspective, however, the answer to these questions relates to the opportunity for organizations to engage with other organizations to access financial, skills, technology or other resources otherwise unavailable to the organization (Das and Teng, 2000; Barney, 1991; Peteraf, 1993; Pfeffer and Salancik, 1978). Being able to profit from these opportunities can demand certain capabilities on the receiving side as well. For example, the more tacit and difficult to imitate types of competencies (such as certain skills and organizational culture) require that a firm develops high receptivity and strong learning intent leading to a high absorptive capacity (Doz, 1996; Gulati and Singh, 1998; Kumar and Nti, 1998). Networks can also be considered a specific type of resource that organizations can use (Gulati and Gargiulo, 1999; Kothandaraman and

Wilson, 2001). Criticisms to this perspective include the limited attention that this theory pays to the cost-benefit equation of acquisition of resources (Barringer and Harrison, 2000) or the risks associated with unwilling resource sharing at the operational level (Hamel et al., 1989).

A variation of this theory, found in the cross-sector literature, refers to the magnitude of the challenge and sector failure (Bryson et al., 2006; Subramanian et al., 2006). Bryson et al. identify 'sector failure' as an instance where single-sector efforts to solve a public problem have failed or are likely to fail. In this case, when the failure cannot be solved by a single sector, cross-sector collaboration is more likely to occur. For example, socio-economic issues of developing country farmers or increased interest in health, food safety and global biodiversity (Giovannucci and Ponte, 2005/6; Ponte, 2002) have been identified as an important driver in the establishment of multi-stakeholder networks.

Another perspective on motivations to establish networks is associated with Political Economy and Market Power Theory. This theory is primarily concerned with the distribution of two scarce resources: money and authority (Benson, 1975). As such, these specific resources take a predominant place in the creation of relationships, and alliances are understood to be created as offensive or defensive mechanisms to increase market power through relationships or as a defence against power exerted by competitors (Hamel et al., 1989; Hymer, 1972; Porter, 1985). Power Theory identifies resource scarcity as a need to engage in networks, but this resource need results in a motivation to attempt to exert power, influence or control over organizations that possess these resources (Oliver, 1990). An important evolution in this literature has been to go beyond an individualistic, narrow view of the firm to extending the concept to larger groups of firms, incorporating the idea of groups of firms creating networks to increase market power, such as 'flagship firms based competition' (Rugman and Verbeke, 2003; Verbeke and Rugman, 2004) or the Japanese form of 'keiretsu' network (Lincoln et al., 1992).

Institutional Theory provides yet another perspective on motivations for network creation, proposing that institutional environments impose pressures on organizations to appear legitimate and conform to prevailing norms (DiMaggio and Powell, 1983). As such, networks would allow firms the possibility to increase their legitimacy by building their visibility or reputation (Oliver, 1990). In a recent publication, Dacin et al. (2007) identify five sources of legitimacy, namely: market (rights and qualifications to conduct business in a market), relational (worthiness to be a partner), social (conformity to societal rules and expectations), investment (worthiness of business activity) and alliance (validity of strategic alliances). Again, as in most of the alliance literature in the management field, institutional theory focuses on why an alliance is created and the effects of these relationships on the firm's performance, rather than on how an alliance is operated and how it evolves over time.

Yet another view of network creation identified in the research is the Stakeholder Theory approach. In the influential book *Strategic Management: A Stakeholder Approach*, Freeman (1984) argues that corporations need to establish closer relationships with their stakeholder organizations. These relationship networks have been presented as a way for the firm to align their interests with the interests of stakeholders and also to reduce uncertainty related to stakeholders' actions (Jones et al., 1997; Wheeler et al., 2003). Jones and Wicks (1999) link this perspective to the power theory and the resource based view presenting an instrumental view of stakeholder theory whereby the motivation to establish closer stakeholder relationships on the basis of mutual trust and cooperation allows the firm 'to have a competitive advantage over firms that do not'. Stakeholders can also be valuable in their own right and establishing relationships with these groups can be an important objective for corporations (Evan and Freeman, 1983).

The theoretical perspectives presented above assume a clear instrumental purpose and presuppose a clear understanding by each actor of the potential costs and benefits of entering such a relationship. Arriving at networks from a different perspective, Social Exchange Theory presents networks as exchanges that may or may not involve extrinsic benefits with objective economic value (Das and Teng, 2002). The theory is originally based on the examination of interpersonal exchanges that are not purely economic, where benefits are 'expected and typically in fact bring from others' (Blau, 1964, p.91). Its approach differs from the other perspectives in that the objects of study are more frequently multi-actor networks. This theory also differs from other viewpoints in that it focuses on the linkages among the actors and the relative positions actors occupy in the overall network as a result of these linkages. Certain actors may be placed in a central position in a network (Freeman, 1979) or be positioned as linkages between two other actors not otherwise connected, and this provides an opportunity to exert power (Burt, 1982).

Table 2-12 summarizes the research focus and approach of the eight main theoretical perspectives identified in the network literature.

Efforts to integrate views across these different perspectives have also been made by some authors. Oliver (1990) incorporates different perspectives and identifies six critical contingencies of relationship formation across organizations, settings and linkages: necessity (mostly legal/mandatory), asymmetry (potential to exercise power or control over another organization as when resource scarcity exists), reciprocity (rooted in exchange theory cooperation, where collaboration and coordination rather than domination prevail), efficiency (transaction cost economization as an example), stability (predictability) and legitimacy (demonstrate or improve reputation, image).

Table 2-12: Overview of motivations to enter networks

Motivation	Key Themes	References
Reduce Transaction Cost	<ul style="list-style-type: none"> Diminish costs by managing and monitoring transactions under conditions of uncertainty or asset specificity 	(Christopher, 1992; Williamson, 1975; Cavinato, 1992; Williamson, 1979; Ellram and Hendrick, 1995)
Increase Benefit-Cost Ratio	<ul style="list-style-type: none"> Total costs and rewards of association (including transaction costs) are higher than without association 	(Dwyer et al., 1987; Scanzoni, 1979; Kothandaraman and Wilson, 2001; McWilliams and Siegel, 2001)
Access to resources	<ul style="list-style-type: none"> Cooperation may exist to secure access to financial, skills, technology or other resources Networks can be a specific type of resource 	(Das and Teng, 2000; Barney, 1991; Pfeffer and Salancik, 1978; Di Maggio, 1986; Lavie, 2006) (Gulati and Gargiulo, 1999; Kothandaraman and Wilson, 2001)
Magnitude of the challenge – Sector failure	<ul style="list-style-type: none"> Private sector competence exists in an area where there are significant externalities Single sector efforts to solve a public problem are insufficient 	(Subramanian et al., 2006) (Bryson et al., 2006)
Increase market power	<ul style="list-style-type: none"> An organization can enter offensive and defensive alliances to increase its market power. 	(Doz and Hamel, 1998; Hamel et al., 1989; Porter, 1985; Porter, 1980; Porter, 1998)
Seek legitimacy	<ul style="list-style-type: none"> Seek legitimacy vis-à-vis markets and societies in which organization operates 	(DiMaggio and Powell, 1983; Baum and Oliver, 1991; Dacin et al., 2007)
Manage stakeholder relationships	<ul style="list-style-type: none"> Manage constellation of cooperative and competitive interests among stakeholders Stakeholders are valuable in their own right and relationships are important 	(Freeman, 1984; Jones and Wicks, 1999; Donaldson and Preston, 1995) (Evan and Freeman, 1983)
Social Network Theory	<ul style="list-style-type: none"> Interpersonal exchanges are not purely economic and benefits are expected and typically result in the interaction with others 	(Freeman, 1979; Blau, 1964; Burt, 1978)

In addition, although these different motivations are presented as distinct reasons and authors reviewed in the research tend to focus on only one of these areas as a main explanation of network creation motivations, Barringer and Harrison (2000) note that in practice most firms tend to have a portfolio of reasons for alliance creation rather than just one reason.

2.7.4 Context factors

Based on the first conceptual framework, the initial focus of the research was motivations as the key variable in the creation of networks. As the literature review progressed, however, several authors identified context factors as forces enhancing or preventing the creation of networks and this was later introduced as an additional component in the review.

These views on context factors, namely the external or macro context, the internal organizational context and the relationship-specific contextual factors, have thus been integrated into the review.

External context

While most of the early research on alliances and networks focused on the elements that were specific to the studied relationship in isolation of the surrounding environment, the context where these relationships take place has been receiving increasing attention, especially after Granovetter's (1985) articulation of the concept of 'embeddedness'. Granovetter develops an earlier contribution from Polanyi (1957), recognizing the extent to which economic institutions are embedded in political and social institutions. The concept of social and political embeddedness is also related to institutional embeddedness, referring to the legal system, the banking system and the political system in which the inter-firm cooperative structures are set up (Grandori and Soda, 1995). Organizations are then embedded in a certain context that can be more or less stable and more or less predictable (Koenig and Mellewigt, 2006; Bryson et al., 2006).

Macro-trends: Most academics addressing the subject of network creation agree that macro-trends such as globalization, pace of technology change, shorter product life cycles and the tendency to outsource non-core activities are important contextual factors supporting the creation of networks (Das and Teng, 2000; Barley et al., 1992; Doz, 1987; Faulkner and De Rond, 2000). Transaction Cost Economics refers to uncertainty on exogenous factors such as future market conditions as playing a central role in the creation of networks (Williamson, 1975), while Gulati and Gargiulo (1999) affirm that uncertain environments can favour the creation of networks as a mechanisms for organizations to access resources and capabilities that can help them cope with these exogenous constraints (Gulati and Gargiulo, 1999).

Product/Sector characteristics: Some sectors are more prone to establishing more (or closer) networks than others. De Toni and Nassimbeni find that in some industries the need for informative and logistic integration between activities at the upper and lower ends of the production chain, mutual involvement in product development, coherence between the respective orientation systems, co-operation in the creation of value and reduction in overall costs of the transaction promote the creation of 'strong linked' buyer-supplier systems (De Toni and Nassimbeni, 1995). Functions with high costs and risks such as research and development have also been linked to increased network activity (Ring et al., 2005). Lamming et al. (Lamming et al., 2000) find that in the context of supply networks, the degree of complexity and the need for innovation in different product groups also influence the type of partner that will be sought in a supply network. For example, the priority in lower complexity functional products will be cost and, therefore, the partners being sought and the type of relationship to be established will reflect this condition.

Competition, Legislation and Society pressure: In the market power theory, the degree and type of competition in an industry is identified as a contextual

determinant in the creation of networks. According to this perspective, the propensity to create offensive or defensive alliances is linked to the type of competitive, legislative and even societal environment found in the industry. Networks are tools that a firm can use to increase market power or as a defence against power exerted by competitors (Hamel et al., 1989; Benson, 1975; Porter, 1985; Porter, 1998). Weak or inexistent government legislation can promote the establishment of networks to promote self-regulation or anticipate regulation in an industry (Lenox and Nash, 2003). External pressure exerted by the community or by specific groups is considered a driver to pursue relationships with other organizations. In line with institutional theory where firms enter alliances to appear legitimate vis-à-vis the markets and societies in which they operate (DiMaggio and Powell, 1983; Baum and Oliver, 1991; Dacin et al., 2007), relationships with reputable organizations can help deal with external pressures in ways that just market transactions or internalization of functions would not. Networks can then provide the 'license to operate' and the endorsement from respectable stakeholders (de Man and Burns, 2006). On this, Iwanow et al. (2005) and Argenti (2004) find that non-governmental organizations (NGOs) and the media have an important influence in creating 'pressure' for corporations to establish relationships with specific groups with the aim of becoming (or being seen) as more sustainable.

Network activity: The increasing number of networks can, in itself, be a driver of increased network creation. DiMaggio and Powell (1983) posit that, as more organizations enter networks, isomorphic pressures would impact the propensity of increased network activity in the industry.

Social networks: The social networks within which organizations are embedded can also shape network relationships by influencing which companies will enter alliances (Powell et al., 1996; Gulati, 1998; Gulati, 1999), which companies are more likely to create ties with each other (Gulati, 1995b; Gulati and Gargiulo, 1999), and how these dyadic relationships will develop (Håkansson and Ford, 2002). Embedded relationships accumulate into a network that becomes a growing repository of information on the availability, competencies and reliability of prospective partners, and firms placed in a social network of trusting relationships can significantly reduce their search for new partners when they decide to ally with an entity they already trust (Granovetter, 1985; Gulati, 1995a).

Internal context

The literature review identified organization capabilities and organization characteristics as the two internal context areas most frequently mentioned as influencing factors in network creation.

Organization capabilities: The relational experience of the partners is highlighted by certain authors as having an influential role in the creation and management of future alliances (Gulati and Gargiulo, 1999). Experience in creating and managing alliances has also been linked to an increase in capabilities to generate value from such partnerships and to protect themselves from opportunistic behaviour (Kale et

al., 2000). The resource based view identifies relationship building capabilities as a 'technological interaction' (Teece, 1998) where a firm's capabilities include the ability to generate and manage technical change, including skills, knowledge, experience, institutional structures and linkages (Johnsen and Ford, 2006). An organization's ability to learn (Hamel, 1991) or its 'absorptive capacity' (Cohen and Levinthal, 1990) also encourages the creation of networks as the organization can be more confident in its ability to gain (and maintain) knowledge or capabilities through relationships.

Organization characteristics: Internal hierarchies, decision-making patterns and involvement of organization members can influence the predisposition of organizations to seek networks (Harland et al., 2004). Also, the level of engagement demonstrated by top management is considered to be an important determinant in promoting the creation of relationships (Anderson and Weitz, 1992; Bryson et al., 2006; Ellram and Hendrick, 1995; de Man and Burns, 2006; Faulkner, 1995).

Relationship factors

Beyond the factors that are specific to the industry or to each actor, there are certain context elements identified in the literature that relate to the relationship itself, to the combination of actors in a dyad or in a network. These factors include the 'distance' between the organizations, the level of relationship uncertainty perceived by the organizations and the structural characteristics of the network itself.

Homogeneous Organization structure and culture: Similar organization structure and culture are considered to enhance the probability of creation of a relationship and to increase its probability of success. Factors mentioned in the literature to favour the creation of networks include elements such as: similar size, technological sophistication, compatibility of corporate values, philosophies and techniques (Lambert et al., 1996a; Ellram and Hendrick, 1995; de Man and Burns, 2006; Fey and Beamish, 2000; Rábade and Alfaro, 2006).

By the same logic, networks would then be less prevalent when significant differences exist in culture, national origins or physical distance between the organizations (Bryson et al., 2006; Rábade and Alfaro, 2006; Jap and Ganesan, 2000; Morgan and Murdoch, 2000; McCutcheon, 2000). Reuer et al. (2002), however, challenge this and point to empirical research that doesn't support this view.

Relationship uncertainty: Beyond the uncertainty of future states of nature that was discussed in the previous section, organization managers can also face uncertainties regarding the trustworthiness of the other party (Ring and Van de Ven, 1994) that will impact negatively the propensity of organizations to create or enter networks.

Network structure: The sum of existing relationships accumulates into a network that becomes itself a growing repository of information on the availability, competencies and reliability of prospective partners, and firms placed in a social network of trusting relationships can significantly reduce the cost of search for new partners (Granovetter, 1985; Gulati, 1995a). Nohria (1992) posits that actions and behaviour of

individuals and organizations can be explained, at least partly, in the context of their position in a network. He proposes that variations in the actions of actors can be better explained by knowing their position relative to others in various networks of relationships rather than by knowing how their attributes differ from one another. Three particular aspects of network position that are identified in the literature as impacting the creation of networks are the relative prominence (who is more or less in demand), range (the sum of total actor relations) and brokerage (ability to mediate among disorganized actors) of actors vis-à-vis each other (Nohria, 1992).

2.7.5 Network creation process

Authors from the dynamic literature perspective calling for increased attention to process research point out the limited level of guidance that is available for organizations in the creation of networks (Salk, 2005; Ring et al., 2005). These calls stress the importance process has in the creation and subsequent success of collaboration (Ring et al., 2005) and in setting the initial conditions that determine future learning and adaptability (Doz, 1996).

Though there are differences in the scope of which activities and processes are considered within the creation phase of a network, most authors agree that it includes elements such as partner identification and selection, individual and joint expectation creation, negotiations and commitments.

Partner identification and selection:

Several articles, especially those aligned with the life-cycle approach, identify specific steps that network creation processes follow. Dwyer et al. (1987) and Scanzoni (1979) include in their models moments of attraction, communication and bargaining, development and exercise of power, norm development, and expectation development. Ellram and Edis (1996) also propose a specific process for the creation of relationships, distinguishing four steps: 1) Preliminary - Establishing strategic needs, forming an internal team and confirming top management support; 2) Identifying potential partners – Including benchmarking best practices, determining selection criteria and identifying potential partners; 3) Screening and selecting - Contacting potential partners, reviewing proposals, evaluating suppliers and reaching a decision; 4) Establishing the relationship – Including the engagement and visibility of top management, documenting expectations, providing high attention level to the venture and giving prompt feedback to adapt the terms of the relationship.

Though life-cycle approaches have been regarded as useful frameworks to identify the elements involved in creating a network, they have also been criticized for being too mechanistic and deterministic in their view by implying there is one active and one passive party (Ford et al., 1986) when in most cases the process of creating a network is more likely to be interactive and involving two or more active partners (Harland et al., 2004). Ford (1980) also finds that an additional difficulty with the traditional approach lies in that it ignores alternative processes for partner identification, and Granovetter (Granovetter, 1985) points to the heavy assumption it

places on information availability and quality, implying 'that firms exist in an atomistic system where information is available and accessible to everyone and opportunities for alliances are exogenously presented'.

Gulati (1998) presents the concept of embeddedness as a main driver in the identification of potential partners as 'actors who share direct connections with each other are likely to possess more common information and knowledge of each other'. Information on the availability, needs and requirements, and reliability of those partners would then be dependent on the networks in which it operates. The embeddedness of firms in networks and their structural position in them would then influence the extent to which firms have access to information about potential partners and the attractiveness of such potential partners.

In a study of formation processes in R&D consortia, Smith Ring et al. (Ring et al., 2005) also challenge the idea that there is only one path to network creation. Based on differences in initial conditions such as the level of interest convergence, strategic importance of the relationship and existing social relationships, the authors distinguish three alternative processes that occur in network formation. The first is an 'emergent process' pulled by the strength of mutual interest, even if social and strategic relationships are weak, for example, when a new competitor or technology evolution threatens a whole industry. The second option involves an engineered process, similar to the practice presented by Ellram and Edis, suggesting that there is a key design role for the triggering entity. The third option attributes the role of creation of networks to the strong social relationships that are already embedded in a relationship, making the actors aware of strategic interdependencies. These three different formation processes will then lead to different priorities in the creation of the relationship, whether producing consensus on vision and mission in the case of emergent processes, or developing awareness of interdependency to deal with expectations from partners in engineered processes or providing a more formal and structured approach in embedded processes.

Sense making and negotiation:

The network creation process also identifies a process of approaching the partner, making sense of the value of the relationship and the reliability of the partner, and developing joint agreements about activities, resources and the mechanisms that will govern the relationship.

Two differing views on this process have to do with the time and the scope of the relationship. One view presents a gradual approach to networks that begins with small, informal deals and which initially requires little reliance on trust because it involves low risk (Ring and Van de Ven, 1994; Van De Ven, 1976). In the buyer-seller literature, Ford (1980) identifies such gradual development of a relationship with an intermediate stage where negotiation of a sample delivery can take place. As distance is high and experience low, there is a high level of uncertainty in the relationship and management time is heavily invested in exploring the value of the relationship, but the actual negotiation is gradual.

The second view considers negotiation as a formal bargaining process that takes place at a specific point in time where 'the parties develop joint expectations about their motivations, possible investments and perceived uncertainties of an activity they are exploring' and a formal bargaining process takes place as the parties 'persuade, argue, and haggle over possible terms and procedures of a potential relationship' (Ring and Van de Ven, 1994, p. 97).

The approach chosen can also be dependent on the circumstances of the relationship. Parties decide the extent, in terms of length and intensity, to which they want to take their formal bargaining processes (Ariño and Reuer, 2004; Vlaar et al., 2006). This will depend on factors such as the threat of opportunistic behaviour, the level of investment required (Parkhe, 1993b), the strategic importance of the alliance (Gomes-Casseres, 1996) and its projected duration (Crocker and Reynolds, 1993, cited by Ariño and Reuer, 2004).

A series of factors has also been identified in the literature as supporting or deterring the processes leading to successful creation of networks. Huxham and Vanghen point to developing a shared purpose as an important moment in the creation of a network and go as far as saying that if partners do not completely agree on a shared purpose, this impedes their agreement on steps (Huxham and Vangen, 2005). Kumar and Anderson (2000) identify three kinds of meaning that are necessary for the alliance to make sense for each of the partners: pragmatic meaning of achieving operational coordination among alliance employees, moral meaning of dealing with justice at structural and interpersonal levels, and cognitive meaning of providing a convincing rationale for the initiation and continuation of the alliance to their relevant stakeholders.

As in the case of partner identification and selection, the negotiation and sense-making process is again believed to be impacted by the existence of prior relationships (Granovetter, 1985; Gulati, 1995a; Granovetter, 2005) as these would have allowed the opportunity to build a higher level of inter-organizational trust and reputation (Gulati, 1995a) and would require less exhaustive evaluation (Rowley, 1997).

Some authors have also found that, in addition to the history predating the relationships, the more immediate history can also influence network creation where the selection and negotiation states of the relationship can provide a basis on which mutual confidence and trust can develop (Faulkner and De Rond, 2000; Faulkner, 1995).

2.7.6 Initial network conditions

Initial conditions

After a negotiation phase, parties agree on the obligations and rules for future action in the relationship (Ring and Van de Ven, 1994), entering a collaborative agreement that incorporates formal/contractual aspects as well as a set of norms and 'psychological' or informal contracts, and which defines the conditions of the collaborative agreement.

Håkansson and Snehota (1995), basing their analysis on research conducted by the Industrial and Marketing Purchasing (IMP) group, propose studying these collaborative agreements at three levels: activity links, resource ties and actor bonds. In their business-to-business relationship analysis, activity links refer to technical, administrative, commercial or other activities of a company that can be connected to those of another company; resource ties refer to technological, material or intangible resources connected among the firms; actor bonds connect actors and influence actors' perceptions of each other. Other authors in this field offer variations in terms of scope and definitions of these three categories. For example, Harland et al. (2004) include under activity areas that refer to governance of the relationship, as do other authors like Gulati (1998) and Johnsen et al. (2006). Most authors, however, distinguish at least three important areas where initial conditions are set: activities and linkages, resources, and governance or coordination mechanisms.

Activities and Resources:

Håkansson and Snehota's linkages of activities involve the technical, administrative or commercial activities that become linked to those of a partner organization. In turn, these activities are linked to other activities, both within the firm and with other organizations, creating complex activity patterns that impact costs and effectiveness of each firm and of the entire activity chain (Håkansson and Snehota, 1995).

Taking a broader definition of what constitutes an activity, Johnsen et al. (2000) identify eight different networking activities related to the process of establishing and operating supply networks: partner selection, resource integration, information processing, knowledge capture, social coordination, risk and benefit sharing, decision-making, and conflict resolution. In a subsequent development of this model, Harland et al. (Harland et al., 2004) also incorporate motivating as an activity, thus resulting in a total of nine areas of relationship activities, reproduced in Table 2-13.

Table 2-13: Harland et al.'s summary on networking activity

Networking Activity	Themes	References
Partner selection	<ol style="list-style-type: none"> Types of supply relationship Formation types History of prior engagement 	<ol style="list-style-type: none"> Cousins (1992), Ellram (1991) Doz, Olk and King (2000) Gulati (1998)
Resource integration	<ol style="list-style-type: none"> Physical, site and human assets specificity Human assets and site specificity and supply network performance Employee integration in supplier networks Information systems integration: VMI, continuous replenishment Buyer-supplier adaptations 	<ol style="list-style-type: none"> Williamson (1979, 1985) Dyer (1996) Hines (1996) Lamming (1996), Scott-Morton (1991) Brennan and Turnbull (1995)
Information processing	<ol style="list-style-type: none"> Information exchange dynamics Lean supply Supply chain management/logistics IT 	<ol style="list-style-type: none"> Julien and Lachance (1999) Lamming (1996), Womack, Jones and Roos (1990) Bowersox, Closs and Helferich (1986), Christopher (1992) Scott-Morton (1991)
Knowledge capture	<ol style="list-style-type: none"> Organizational learning Collective entrepreneurship Shared learning Exchange of tacit and proprietary know how Learning in buyer-supplier relationships, <i>Kyoryokukai</i> Learning networks Knowledge-sharing routines 	<ol style="list-style-type: none"> Argyris and Schon (1996) Lundvall (1992) Garvin (1993) Helper (1990) Hines (1996), Lamming (1996) Powell, Koput and Smith-Doerr (1996) Dyer and Nobeoka (2000)
Social coordination	<ol style="list-style-type: none"> Stable relationships based on group norms, reputation and peer control Trust, fine-grained information transfer and joint problem solving 	<ol style="list-style-type: none"> Grandori and Soda (1995), Ouchi (1979, 1980) Uzzi (1997)
Risk and benefit sharing	<ol style="list-style-type: none"> Lean supply and cost transparency Incentive systems Trust Benefit sharing and allowances Risk, responsibilities and rewards 	<ol style="list-style-type: none"> Lamming (1993), Womack, Jones and Roos (1990) Grandori and Soda (1995) Ring and Van de Ven (1992), Sako (1992) Stuart and McCutcheon (1996) Hall (1999)
Decision-making	<ol style="list-style-type: none"> Connectedness Interdependency Shared decision-making and control 	<ol style="list-style-type: none"> Anderson, Håkansson and Johanson (1994) Håkansson and Snehota (1995) Killing (1988)
Conflict resolution	<ol style="list-style-type: none"> Conflict and cooperation as features of business relationships Values, mutual understanding, mediation and arbitration Plans and controls Broker rules 	<ol style="list-style-type: none"> Håkansson and Snehota (1995) Kumar (1996) Lorange (1988) Snow, Miles and Coleman (1992)
Motivating	<ol style="list-style-type: none"> Incentive systems Commitment, trust and culture Mutual orientation 	<ol style="list-style-type: none"> Grandori and Soda (1995) Achrol (1991), Millson, Raj and Wilmon (1996) Ford, Håkansson and Johanson (1986)

Source: Harland et al. (2004)

These activities are not independent from each other. Johnsen et al. (2000) observe that some activities may be intrinsically linked to other activities. In this view, risk and benefit sharing will be related to materials/inventory integration, while knowledge capturing will be linked to human resource integration and information processing to decision-making.

Besides defining activities, in this phase resources are also committed and then shared in the relationship. Grandori and Soda (2006) present resources (technical and human) as a 'potential of action'. Power, information, and money are three types of

resources that can flow along the links of the network (Thorelli, 1986). Turnbull, Ford and Cunningham (1996) add 'network position' (and its rights and obligations, including reputation) as a specific resource that can be a potential of action. Alliance expertise itself can also become a resource as a partner's relational capability evolves with its accumulated experience in recurrent alliances (Anand and Khanna, 2000) and may help it extract alliance benefits (Kale et al., 2002; Lorenzoni and Lipparini, 1999). It also facilitates collaboration with partners by fostering trust building, knowledge sharing and conflict resolution routines (Kale et al., 2000; Dyer and Singh, 1998).

2.7.7 Initial Governance mechanisms

The third area identified as part of the network conditions is centred on the governance mechanisms chosen to manage the network. The topic of both coordination and governance mechanisms has been extensively covered by most of the areas of literature that deal with network relationships and is considered a critical element of a network, affecting both value creation and appropriation in a relationship (Vlaar et al., 2006).

Most of the network literature presents the use of contracts, equity participation and informal coordination mechanisms as a decision that is made at the beginning of the relationship to ensure that tasks are conducted in an appropriate way (Heide, 1994; Kirsch, 1997), to maximize the benefits to be derived from the relationship and to mitigate risks, coordination and control issues (Blumberg, 2001). These tasks, benefits and risks, visible or perceived at the time of formation of the relationship, are then closely linked to the antecedents to formation of the relationship and the reasons for its formation. Thus, most of the empirical and theoretical research on governance mechanisms links the decision regarding which governance mechanisms to use to factors predating the relationship such as: uncertainty, risk of opportunistic behaviour, asset specificity (Williamson, 1979; Williamson, 1985; Anderson and Weitz, 1992; Hennart, 1988), nature of firms, resources and capabilities (Madhok and Tallman, 1998), power dependence (Pfeffer and Salancik, 1978), alliance experience (Gulati, 1995b), and pre-existing relationships, embedded social structures and relational capital among parties (Granovetter, 1985; Gulati, 1995a).

Governance choices include a variety of mechanisms of coordination employed to sustain inter-organizational cooperation (Grandori and Soda, 1995), including formal mechanisms such as the specific set of contracts and obligatory arrangements (Ellram and Edis, 1996), the legal structure that is used to govern the relationship (Nassimbeni, 1998), and informal mechanisms such as the implicit norms of behaviour (Heide and John, 1992; MacNeil, 1981), conventions or standards (Ponte and Gibbon, 2005), pledges (Anderson and Weitz, 1992) and informal cultures and social bonds among managers (Wilson, 1995; Spekman et al., 1998b).

Governance mechanisms identified in the literature

Contracts:

Formal interfaces encompass the control and reporting mechanisms through which firms structure their interaction and provide a frame of reference for the alliance to operate in (Larson, 1992). Contracts, as one of the most common formal mechanisms, can be developed and sustained by parties who negotiate and make commitments to a cooperative relationship. These commitments, for a sufficiently long period of time among autonomous units, will render the activities and behaviour of each coherent with the strategic project of the whole system (Nassimbeni, 1998).

Conventions and standards:

Ponte and Gibbon (2005) examine the role of conventions as regulating mechanisms in networks. Conventions refer to rules that are not decided prior to action but which emerge in the process aimed at solving problems of co-ordination. Conventions can also arise from a shared set of regularities that are unintentional (Ponte and Gibbon, 2005, p.6). Examples of these conventions can be certain 'quality conventions' (productivity, competitiveness) or 'ethical products conventions' (certain production or trade process).

Pledges:

Pledges are actions undertaken that demonstrate good faith and bind the members to the relationship and can be used as a formal or as an informal coordination tool. These can be idiosyncratic investments specific to a channel relationship, such as training or dedicating personnel, or contractual (Anderson and Weitz, 1992). In an empirical research involving 378 pairs of manufacturers-distributors, Anderson and Weitz (1992) found that one type of pledge, idiosyncratic investments, had a strong effect on the commitment of both parties to the relationship. In addition, each party's commitment was affected by the perceived commitment of the other party. The authors therefore conclude that 'idiosyncratic investments signal commitment, affecting each party's perceptions of the other party's commitment' (Anderson and Weitz, 1992, p.18).

Norms:

Norms have been defined as 'expectations about behaviour that are at least partially shared by a group of decision makers' (Heide and John, 1992, p.34) and are directed toward collective or group goals (Gibbs, 1981; MacNeil, 1980). Extensive relations between partners can foster the development of shared norms of behaviour and explicit network knowledge-sharing routines (Walker et al., 1997 cited by Ahuja, 2000).

In the area of relational exchanges, Macneil (1980) distinguishes between discrete norms, which are expectations about an individualistic or competitive interaction between exchange partners, and relational norms based on the expectation of mutuality of interest, designed to enhance the wellbeing of the relationship as a whole. Heide and John (1992) argue that, in the absence of supportive norms, it is not

possible for parties whose specific assets are at risk to acquire vertical control as per the transaction cost prescription. Further, the authors argue that the presence of supportive (or relational) norms provides confidence to a party that relinquishing control will not create a condition of vulnerability.

Jap and Ganesan (2000) elaborate on a previous contribution by Dwyer and Oh (1988) and integrate views on three types of relational norms: solidarity, information exchange and participation. Solidarity is a bilateral expectation that behaviours are directed toward relationship maintenance and high value is placed on the joint relationship (MacNeil, 1980). Information exchange is the expectation that the parties will freely and actively provide useful information to each other (Heide and John, 1992). Participation refers to the joint expectation that both parties will share and make decisions and set goals regarding all aspects of the exchange (Dwyer and Oh, 1988).

In addition to their role as governance mechanisms, norms and trust-based governance are also believed to become an important source of network benefits because they provide alliance partners with appropriate incentive to share valuable knowledge with each other (Kale et al., 2000).

Social coordination and control:

Grandori and Soda (Grandori and Soda, 1995) refer to social coordination and control as a mechanism to achieve stable relationships based on group norms, reputation and peer control. Social network theory refers to social coordination and control mechanisms as organic or informal social systems in contrast to bureaucratic structures within firms and formal contractual relationships between them (Nohria, 1992; Lincoln et al., 1992). Informal control, linked to informal cultures and systems, is considered a powerful mechanism to coordinate networks (Ouchi, 1979 cited by Heide and John, 1992). Larson (1992) argues that social control can actually be more relevant than economic control and that intensity can be high as a result of personal relationships.

Factors influencing the choice and mix of governance mechanisms

The appropriate level of formal and informal mechanisms will vary according to the circumstances. Larson (1992), for example, states that while formal agreements provide a frame of reference in which the alliance operates, informal interfaces are the glue that holds the alliance together. Though the informal coordination mechanisms are not always explicit, thus making it difficult for managers to consciously determine the combination of mechanisms, the importance of balancing the mix has been often highlighted in the literature.

Following the notion that no governance structure is universally superior or inferior, Reuer and Ariño (2002) affirm that the actual form and mix of governance mechanisms that will be selected is linked to factors such as asset specificity, the type of activities that form the relationship, the time horizon and prior relationship experience, and the evolution of the relationship.

Asset specificity

Gulati (1995b) observes that quasi-market ties like non-equity alliances would be the default mode of organizing alliances. But, consistent with Transaction Cost Economics, equity relationships and the management structures that are created alongside are believed to handle better issues related to opportunism and uncertainty (Gulati, 1995a). Reuer and Ariño (2007) also state that, in the presence of high investment on assets specific to the relationship, firms should consider partner-control provisions and complex contracts to cover consequences of breach and termination.

Uncertainty

The most widespread view of the impact of uncertainty on governance decisions is that offered by TCE. This perspective maintains that extending the level of ownership and vertical integration increases control over sources of uncertainty (Williamson, 1991).

TCE theory differentiates between three types of uncertainty: primary (lack of knowledge about states of nature), secondary (unpredictability of actions of other economic actors such as competitors), and behavioural (behaviour of the relationship partner in the future) (Williamson, 1985). The effect on uncertainty on governance mechanisms has not achieved conclusive results in empirical research, supporting the TCE proposition on behaviour uncertainty but with mixed results on the effects of environmental uncertainty (David and Han, 2004; Coles and Hesterly, 1998, cited by Koenig and Mellewigt 2006).

From a different perspective Teece (1992) argues that equity alliances can be useful in a situation of high uncertainty as they provide a mechanism for the distribution of rewards in cases where this cannot be accurately done beforehand.

A more recent perspective brought into the uncertainty debate is that of Real Options Theory, a theory that imports concepts from financial economics on options and highlights the importance of uncertainty and managerial discretion in a dynamic view of the firm (Tong and Reuer, 2007). The theory proposes that the value of holding an option on an asset increases with the volatility of the underlying asset's value. Less hierarchical governance forms can thus provide flexibility to adapt upon the arrival of new information, economizing also on administrative costs (Folta, 1998).

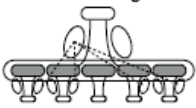
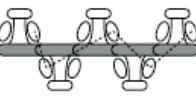

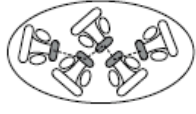
Viaar et al. (2006) offer yet another contrasting view on the interaction between uncertainty conditions and governance mechanisms. Building on Weick's theory of sense-making (Weick, 1995; Weick et al., 2005), the authors propose that formalization can be used as a means to make sense of the partners and lower uncertainty by focusing attention, provoking articulation, instigating interaction and reducing judgment error.

Form of interdependency

Reuer and Ariño (2002) allude to the importance of setting up initial governance mechanisms that are appropriate to the nature of the relationship. They use the example of a well-specified relationship involving a single activity with modes coordination needs where a separate business entity, shared equity and the institution of controls and a board would be considered ‘excessive governance’, leading to slow decision-making and higher bureaucracy costs (Williamson, 1991; Williamson, 1985).

Nassimbeni (1998) also proposes alternative formal mechanisms to accommodate to different forms of interdependency across organizations with respect to the objectives, main area involved in network interactions, and integration vehicles. He distinguishes among four types of interdependencies identified by Mintzberg (1979) – namely, interdependency in work flow, in processes, of scale and in social relationships – and links them with five appropriate coordination mechanisms, also based on Mintzberg’s work (1983): direct supervision, input/output standardization, process standardization, skills standardization and mutual adjustment. Figure 2-6 reproduces Nassimbeni’s proposition linking the nature of interdependencies and the main co-ordination mechanisms.

Figure 2-6: Nassimbeni's interdependencies and co-ordination mechanisms

	Main class of Interdependence	Main co-ordination mechanism	
Main-contractor and subcontracting units 	Flow interdependencies	Interdependencies in SOCIAL RELATIONSHIPS	Direct supervision
Production spinnerets 	Scale interdependencies		Input/output standardisation
Agreements, Joint-Ventures 	Process interdependencies		Skills standardisation
Regional industrial systems 	Process interdependencies		Process standardisation
			MUTUAL ADJUSTMENT

Source: (Nassimbeni, 1998)

Gereffi et al. (2005) cite three key variables in determining the appropriate type of governance: complexity of information and knowledge required to sustain a particular transaction, ability to codify and transmit this information efficiently, and the capabilities of the supply base in relation to the requirements of the transaction. But lead firms able to embed complex quality information into widely accepted standards and codification and certification procedures can exert power in 'buyer-driven' chains even though they are characterized by 'hands-off' forms of co-ordination between 'lead firms' and their immediate suppliers (Dolan and Humphrey, 2000; Ponte and Gibbon, 2005; Gereffi et al., 2005; Gereffi, 1994).

From a Resource Based View of the Firm, Das and Teng (2000) propose appropriate governance mechanisms in terms of equity participation (minority and joint venture) and contracting (unilateral or bilateral contract) as a function of the type of resources shared across firms (property-based or knowledge-based). Though the focus of the research is on the use or not of equity relationships beyond the scope of this research, an important message is the role discrete contracts can play in preventing spillage of tacit knowledge across firms, while equity investments such as joint ventures enable the firm to access (or share) knowledge-based resources more efficiently. Bilateral contracts can help protect the involuntary sharing of knowledge (Kogut, 1988) inherent to a joint venture while at the same time allowing for more learning and controlled sharing than a unilateral contract such as a licensing agreement. It can be derived from this that networks formed in more knowledge-based and implicit-knowledge based contexts such as research and development, customer relationships and knowledge-based industries would require more contractual safeguards in the case of organizations sharing knowledge-based resources.

Relational quality and pre-existing relationships

The mix of formal and informal mechanisms can also be influenced by pre-existing relationships. Successive collaborative relationships between organizations can reduce behavioural uncertainty and hence reduce the need for elaborate contracts (Ariño and Reuer, 2004; Ring et al., 2005) as these relationships would have had the opportunity to build up inter-organizational trust and reputation, reducing the risk of opportunistic behaviour (Gulati, 1995a) and, in general, requiring less exhaustive evaluations (Li and Rowley, 2002).

Using comprehensive multi-industry data on alliances made between 1970 and 1989, Gulati (1995a) finds evidence that repeated alliances between two partners are less likely to be organized using equity than first-time alliances.

Ariño and de la Torre (Ariño and de la Torre, 1998) combine the concept of personal bonds between key executives, previous contributions and broader reputation that the partners have for fair dealing into one 'Relational Quality' attribute. Either as a pre-existing condition or built during the course of a relationship, the impact of

relational quality can influence governance decisions based on the trust that has developed among the actors.

Quality of the relationship can also be built, at least to a certain level, during the first encounters and the negotiation phase (Vlaar et al., 2006), and this can influence not only the decision to go ahead or not with the relationship but also the degree of formalization and detailed contracting that the partners wish to use to manage the relationship.

Power balance:

Related to the concept of governance, certain authors considered in the Systematic Literature Review addressed the concept of power, how it is distributed across parties and how it impacts the governance mechanisms adopted.

In the supply chain literature, Peck and Juttner (2000) propose that the degree of symmetry in collective strategizing behaviour in the chain will influence the balance of the control mechanisms. The higher the degree of symmetry in collective strategizing, the more balanced the control mechanisms underlying the relationship will be. However, an asymmetric strategic initiative undertaken by the dominant party in the chain and governed by means of power can be very effective in improving the coordination between all supply chain parties involved (Peck and Juttner, 2000).

Adobor (2006) distinguishes between the type of power exercised by dominant firms over dependent firms in dyadic relationships and the kind of power compatible with network relations, built on social bonds and close relationships. Power in networks, according to the author, is a subtle force 'exercised via process of socialization, peer review and consensus, not executive fiat'. In network analysis, power is an important concept related both to the opportunities available to actors located in specific positions in the network and to the fact that 'its mere existence can condition others' (Thorelli, 1986).

As a summary of this Section, Table 2-14 integrates the variables identified in the literature as influencing the determination of governance mechanisms within five areas: asset specificity, interdependencies, uncertainty, relational quality and the distribution of power among the partners. Though there appears to be agreement among different authors on the impact of certain variables on the decision regarding governance mechanisms and the influence of informal mechanisms of coordination, this is not the case as regards the impact of uncertainty. In this case, the issues appear not to have been resolved and alternative theories are included in the chart as possible linkages.

Table 2-14: Influencing factors on governance mechanisms

Variable	State of variable	Impact	References
Asset specificity	High investment in assets specific to the IOR	Increase control provisions and complexity of contracts	Williamson 1979, 1985, 1989; Ellram and Edis 1996; Reuer 2007
Interdependencies	Flow, scale, process interdependencies	Direct control vs standarization of input/output, skills or process	Nassimbeni 1998
	Complex activity with high coordination needs	Increased control and contracting requirements	Williamson 1985, 1991
	Complexity of information and knowledge required (+), Ability to codify quality information (-)	Development of standards and certification procedures, lower need of detailed contractual arrangements	Ponte and Gibbon 2005
	Knowledge based sharing of resources	Higher use of equity and/ or control mechanisms	Das and Teng 2000 Kogut 1998
Uncertainty	Uncertainty on environment	Increased control and formalization OR Flexibility, less control	Williamson 1991 Coles and Hesterly 1998 Tong and Reuer 2007
		Use of equity provides a mechanisms for distribution of rewards when these cannot be calculated beforehand	Teece 1992
	Uncertainty on behavior of partner	Increased control and fomalization Formalization as a way to facilitate sense-making and lower uncertainty	Williamson 1991 Viaar et al 2006
Relational quality	Pre-existing relationships and relationship built during negotiation phase	Less need for formal governance mechanisms	Jones et al. 1997, Gulati 1995, Ariño and de la Torre 1998, Smith Ring and Van de Ven 1994
Power balance	Balanced power	Increased use of informal coordination mechanisms	Peck and Jutner 2000

2.7.8 Network evolution

The dynamics of cooperation addresses the questions of *how* and *why* networks emerge, grow and dissolve. Smith Ring and Van de Ven define the dynamics of collaboration as the 'sequence of events and interactions among organizational parties that unfold to shape and modify inter-organizational relationships over time' (Ring and Van de Ven, 1994, p.91).

In a review of different perspectives on theories of change, Van de Ven and Poole (1995) group them according to four basic models: life cycle (linear and irreversible organic growth), teleology (the result of purposeful cooperation), evolution (competitive survival) and dialectic (thesis, antithesis, synthesis).

Life-cycle perspectives on network dynamics

Among these different perspectives, life cycle has been the most used in management literature to explain the evolution of relationships (Ellram and Edis, 1996; Spekman et al., 1998b; Dwyer et al., 1987; Ellram, 1991). Dwyer et al. (1987), for example, present buyer-seller relationships as evolving through five phases: awareness, exploration, expansion, commitment and dissolution. Based on a previous contribution by Scanzoni (1979), the authors break down further the exploration phase into five sub-phases: attraction, communication and bargaining, development and exercise of power, norm development, and expectation development.

In the buyer-seller relationship literature, Ford (1980) also identifies five stages in the context of buyer-seller relationships, recognizing an explicit phase of development. He does not, however, address specifically the end stage of a relationship. The five phases included are: 1) Pre-relationship - Evaluation of a new potential supplier is initiated by an episode in current relationships, the efforts of a non-supplier, or an overall policy decision. This phase can also be conditioned by the experience of the buyer with the previous supplier, the level of uncertainty about the potential new relationship, and the 'distance' (geographic, cultural or otherwise) that exists with the potential supplier; 2) Early Stage – During this stage a negotiation of a sample delivery can take place. As distance is high and experience low, there is a high level of uncertainty in the relationship and management time is heavily invested; 3) Development Stage – In this phase a longer term contract is signed or deliveries/orders are scaled up. As increased experience is achieved, the level of uncertainty is reduced and formal or informal adaptations tend to happen. This is also a phase where cost savings can be realized; 4) Long Term Stage - After several major or large purchases, the level of experience becomes very high and the distance between the buyer and seller is reduced to a minimum. Large scale adaptations can take place in this phase; 5) Final Stage: In long, stable markets, extensive institutionalization of the relationship takes place and business is based on 'codes of practice'.

Ellram and Edis (1996) start from an earlier moment than Ford in that they specifically consider the identification of multiple potential partners and the selection among them, which is implicit in Ford's model. The model also addresses reflection and feedback phases. The five phases identified in this perspective are: 1) Preliminary - Establishing strategic needs, forming an internal team and confirming top management support; 2) Identifying potential partners – Including benchmarking best practices, determining selection criteria and identifying potential partners; 3) Screening and selecting - Contacting potential partners, reviewing proposals, evaluating suppliers, and reaching a decision; 4) Establishing the relationship – Including engagement of top management and documenting of expectations; 5) Evaluating the relationship – Establishing relevant measures to report results and, as results get processed, making the decision to either continue at the current level of engagement, expand or build the relationship, or otherwise reduce or dissolve it altogether.

In a multi-actor context, and consistently with social network's theory focus on structure and relative position, Thorelli (1986) identifies four phases that are critical in a network: entry, positioning, repositioning and exit. This last phase would be influenced by the transaction costs involved, which can facilitate or slow down joining or leaving networks.

With no significant contradiction among its proponents and with slight variations on the phases addressed by different authors, the linear cycle perspective helps in the

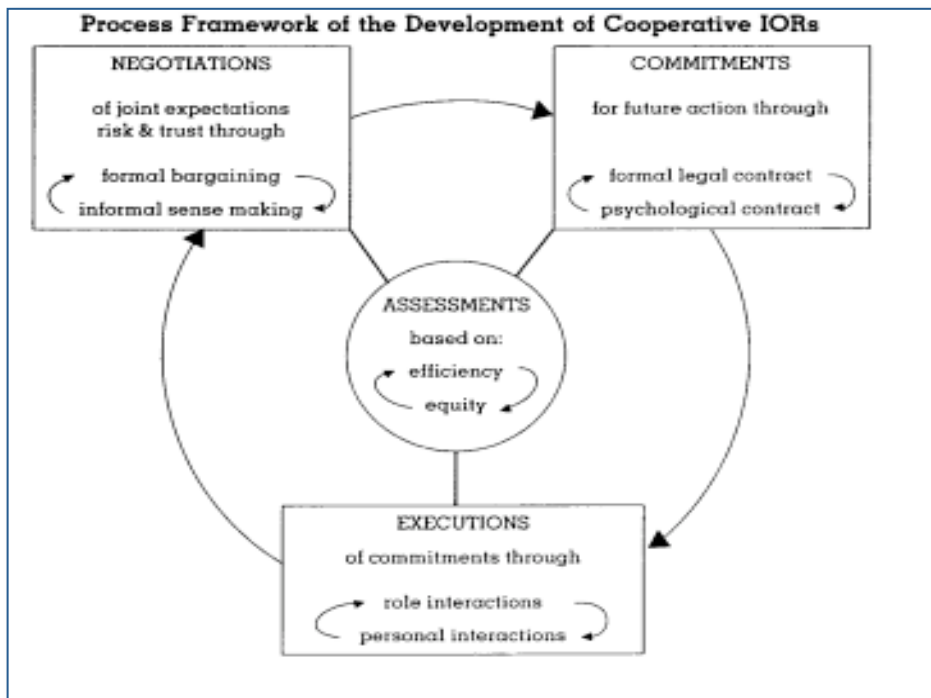
identification of important moments in most networks. It has, however, been criticized for being mostly a linear perspective (2002), not lending itself to cycles or repetitive loops that can occur in a relationship, implying irreversibility in the evolution process. On this, important contributions from the work of Smith Ring and Van de Ven (1994) and Doz (1996) have introduced an iterative perspective to the study of network evolution (Reuer and Ariño, 2002).

Iterative perspectives on network dynamics

Iterative processes see network dynamics as following a circular path, with networks going through repetitive sequences in the relationship. Four models that frame this perspective were identified in the literature review: Smith Ring and Van de Ven’s (1994) process framework, Doz’s (1996) network evolution, Ariño and de la Torre’s (1998) collaborative venture model, and Lambert, Emmelhainz and Gardner’s (1996a) partnering process model.

A first process framework proposed by Smith Ring and Van de Ven suggests analyzing networks as a ‘repetitive sequence of negotiation, commitment and execution stages, each of which is assessed in terms of efficiency and equity’ (Ring and Van de Ven, 1994, p.97). Figure 2-7 reproduces the authors’ depiction of the dynamics of relationships and the iteration of negotiations, commitments and executions, which are impacted by each partner’s periodic assessments of the efficiency and the equity of the relationship.

Figure 2-7: Smith Ring and Van de Ven Process Framework

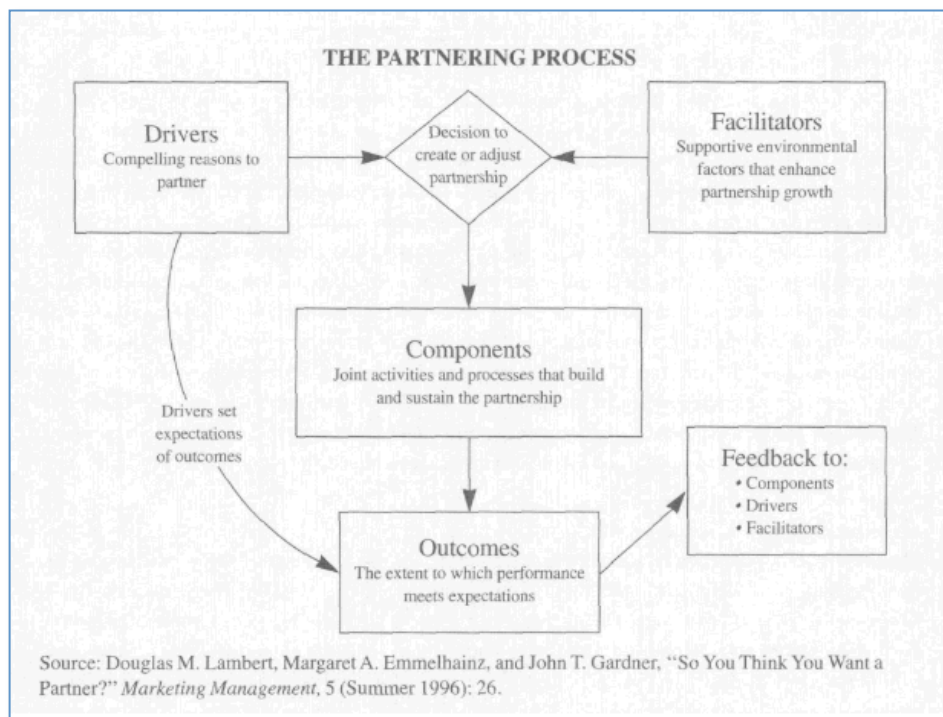


Source: Smith Ring and Van de Ven 1994

The model also follows Ouchi's (1979) prescript that all organizational arrangements must fulfil conditions of efficiency and equity: an organization will enter (and remain) in an alliance as long as it continues to perceive it as an efficient and equitable form for its purposes (Doz, 1996; Ariño and de la Torre, 1998; Ring and Van de Ven, 1994).

In the supply chain literature, Lambert, Emmelhainz and Gardner (1996a) propose a dynamic view of buyer-seller relationships. In this framework, reproduced in Figure 2-8, the authors distinguish a creation phase influenced by internal and external drivers and facilitators that leads to the definition of components of the relationship—including activities and processes – and a set of outcomes which, in turn, becomes an input to an eventual decision to adjust the components of the relationship.

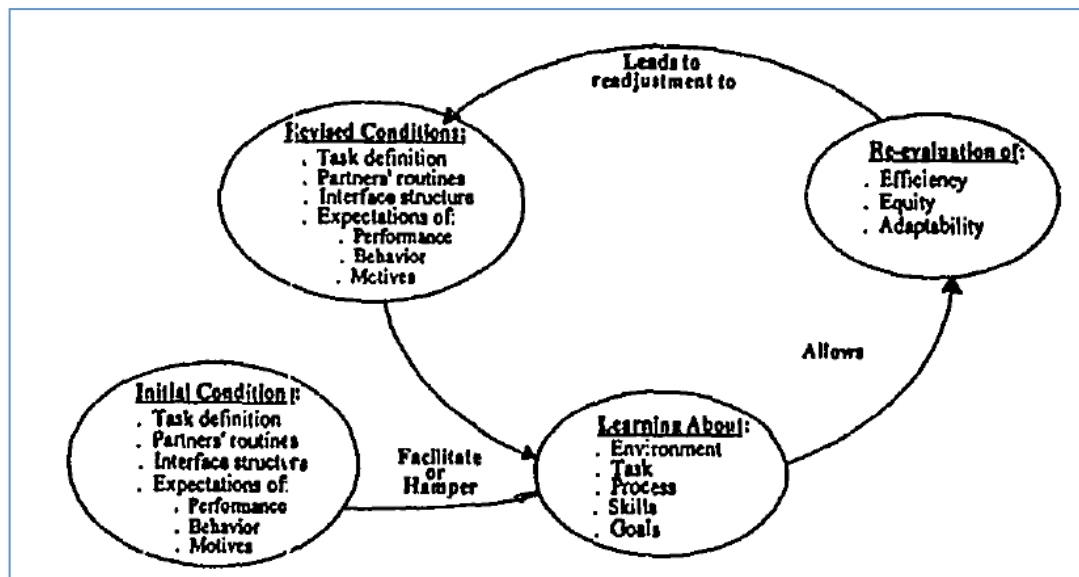
Figure 2-8: Lambert, Emmelhainz and Gardner Model



Doz (1996) also proposes an iterative model that applies a circular view of relationships, but adapts it by adding a special emphasis on the role of initial conditions facilitating or hampering learning on different levels. This learning leads to a re-evaluation of the efficiency, equity and adaptability, and this directs the relationship to revised conditions and a new cycle of learning.

Figure 2-9 reproduces the author's view of these dynamics, with evolution in the form of a loop and leading to an interactive process of learning, re-evaluating and readjusting.

Figure 2-9: Doz's model of network evolution

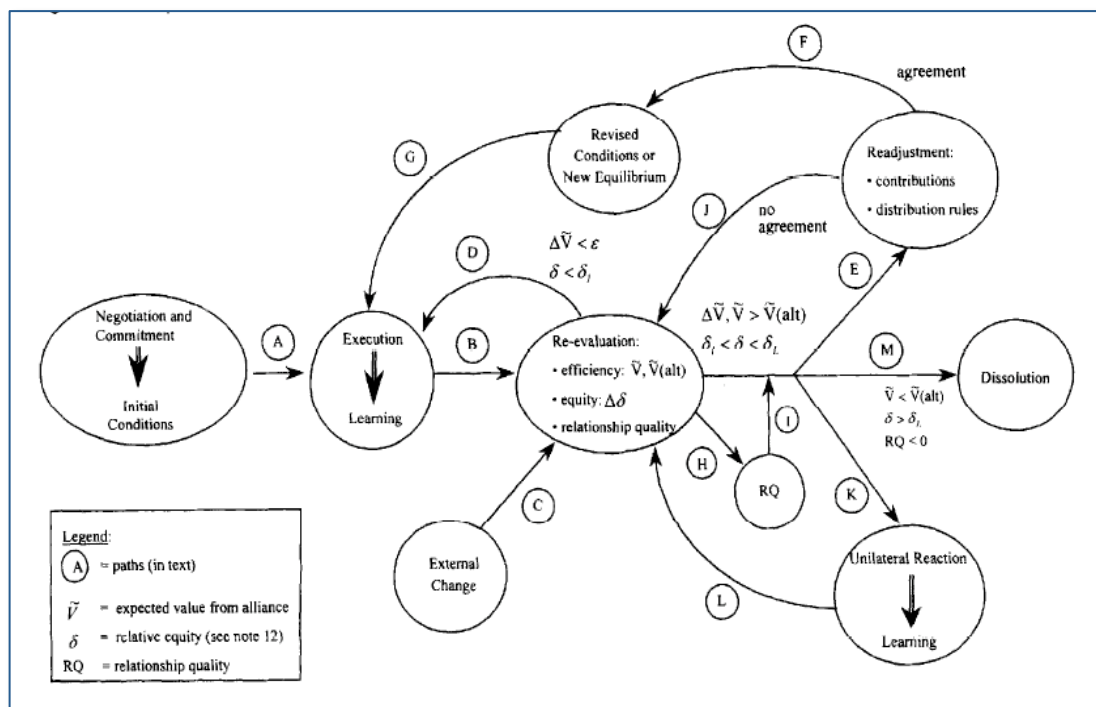


Source: Doz (1996)

Building on the models presented by Smith, Ring and Van de Ven (1994) and Doz (1996), Ariño and de la Torre (1998) propose additional variables in the study of network dynamics: the importance of relationship quality, establishing procedural solutions for conflict resolution as part of the initial conditions, and the role of external change as a trigger of efficiency and equity assessments. The integrative model developed by the authors is shown in Figure 2-10. In a study of failed alliances, the authors support the argument that events in the environment, including the actions of other organizations, will affect the relative value of the relationship for each partner. This is also in resonance with the views expressed by Gulati and Gargiulo who maintain that 'studying the development of an alliance network over time provides unique insights into the evolution of networks, where strategic action and social structure are closely intertwined' (Gulati and Gargiulo, 1999, p.1475).

Though implied in other models, Ariño and de la Torre's model also makes an explicit allusion to the role of relational quality, both as an initial input to the process as well as an output of the interactions between the partners.

Figure 2-10: Ariño and de la Torre's model of collaborative venture evolution



Source: (Ariño and de la Torre, 1998, p. 320)

2.7.9 Evolution of governance mechanisms

Though the literature on governance dynamics has been characterized as ‘limited to a small number of case-based studies and conceptual models’ (Reuer et al., 2002, p.136) it appears to be gaining relevance as an important topic in the study of networks and recent publications have placed a greater emphasis on dynamic aspects of alliance governance decisions (Ariño and Reuer, 2006).

It is nevertheless not always simple to track the evolution of governance mechanisms. The introduction or modification of formal mechanisms tends to follow a formal negotiation or contracting moment in the relationship, making it easier to identify such a change. On the other hand, changes and prevalence of informal mechanisms generally happen through an informal or implicit negotiation process, making it less visible and harder to assess.

Changes in governance mechanisms, as part of network evolution as a whole, have also been recognized to follow pre-determined patterns. Smith Ring and Van de Ven (1994) propose an ‘institutionalization’ of the relationship that becomes evident over time in three ways: 1) personal relationships increasingly supplement formal role relationships, 2) psychological contracts increasingly substitute formal legal contracts, and 3) as the temporal duration of relationships extends beyond the tenure of initial contracting agents, formal agreements increasingly mirror informal understandings and commitments. Following this logic, there would be an initial formal agreement that would then be increasingly overtaken by norms and informal coordination

mechanisms, relying on the personal and role relationships among individual actors in the network.

In a buyer-seller relationship survey among over a thousand retailers, Jap and Ganesan (2000) find that norms may not be fully established in the early stages of a relationship and hence a buyer's ability to exercise needed vertical control is limited. In such instances a buyer may have to rely on other mechanisms, such as contractual protection to safeguard specific assets, but as relationships develop, 'supporting norms may evolve and eventually enable a buyer to establish control' (Heide and John, 1992).

Inkpen and Currall also agree that 'learning about the joint venture partner increases the likelihood that partner firms will reduce their emphasis on formal joint venture controls' (2004p. 593). This relationship, however, is linked to the individual actors that participate in the relationship. Smith and Ring and Van de Ven (1994) find that re-instating formal agreements extends the relationship to other individual actors that have not participated in the relationship before and thus allows the relationship to outlive the initial actors.

Increase in trust produced through an accumulation of prior interactions that were judged by the parties as being efficient and equitable increases the likelihood that parties may be willing to make more significant and risky investments in future transactions (Ring and Van de Ven, 1994).

The opposite trend in governance mechanisms, i.e. the re-negotiation and the introduction of new formal mechanisms of coordination, is also explored in the literature. In one of the few empirical research projects on this topic, Reuer, Zollo and Singh (2002) studied post-creation governance changes among 81 firms in the biotech and pharmaceutical industry. They found that 44% of 145 alliances reviewed experienced changes in at least one of three types of governance: contractual alterations, major changes in the joint board or committee overseeing the alliance, or the introduction or formalization of monitoring mechanisms. These changes occurred when a misalignment existed between the chosen governance structure and features of the transaction, and when the costs involved in attempting to alter the alliance were less than the value expected from altering the governance structure.

Ring and Van de Ven (Ring and Van de Ven, 1994) also propose that supplemental agreements are generally established to deal with misunderstandings or conflicts, whilst informal, psychological contracts can become more prevalent in relationships as partners become more committed to each other and to the relationship.

Ariño and de la Torre (1998) study a longitudinal case of a failed alliance and propose that external shocks and evolution of relationship quality causes actors to either engage in re-negotiation of the terms of the contract or to modify their behaviour unilaterally. These moves, to readjust the respective contributions and the alliance's

distribution rules, will continue until there is a new equilibrium or the relationship is dissolved.

To summarize, the literature identifies two main 'paths' for evolution of governance mechanisms. The first is a relatively generalized view that relationships can go on a 'virtuous cycle' where, as positive trust reinforcement among actors increases, the relationship will tend to depend proportionately more on informal relative to formal governance mechanisms. The second option is where (internal or external) sources of tension arise and make the formal mechanisms inadequate.

Key drivers of governance changes

A number of internal and external variables have been proposed in the literature as forces leading to actors' re-assessments of equity, efficiency and relationship quality and subsequent evolution of governance mechanisms. In addition to the results achieved by the network, external changes or shocks, initial relationship conditions, and relationship evolution are the three key sources of changes in governance mechanisms identified in the reviewed literature.

Results, Strategic Importance, Value:

As the organization bears renegotiation costs when attempting to change governance structures, the relationship has to be worthwhile to engage in such an exercise (Williamson, 1979; Williamson, 1985; Reuer et al., 2002). It is only when the relationship engages more resource commitments but highly relevant to the overall business strategy that the organization has a greater incentive to bear ex-post adjustments costs (Reuer et al., 2002).

Also, the investments of assets in the alliance and the difficulty of an alternative use for these assets would make the partner more willing to engage in re-negotiation of the conditions rather than dissolution of the relationship (Ariño and Reuer, 2004).

Beyond the importance of the relationship and the investments on assets that are specific to the relationship, the performance of the objectives that each partner had defined for itself as a motivation to form a network is an important driver in the assessment of equity by each actor and can influence the change, or not, in governance mechanisms. As Spekman et al. (1998a) state, the results achieved by the relationship are very important in how the partners see the relationship evolving. 'When business is going strong, partners appear to be very willing to ignore problems facing the interpersonal side of the relationship, [and] it is natural to ignore problems when slack resources are many and goals are being reached' (Spekman et al., 1998a, p. 763).

However, Ariño and de la Torre (1998) suggest that if an alliance is assessed as having a lower value than projected, but it is still superior to other alternatives, then a corrective action is required to restore efficiency or equity, and this will lead to a renegotiation process. The results can also be different for each partner. In the Resource Based View of the Firm, uneven learning among the actors can impact the

level of interdependency and bargaining power (Das and Teng, 2002; Inkpen and Beamish, 1997), leading to a renegotiation (or discontinuation) of the network and increasing the likelihood that formal controls will be emphasized by the 'out learned' partner.

Initial conditions:

Initial conditions have been found to promote or deter changes in governance mechanisms over time, depending on the degree of alignment between the early governance structure including the fundamental attributes of the transaction and the broader contracting environment (Williamson, 1985). If these are not aligned in the beginning, the probability of renegotiation as the relationship unfolds increases (Reuer et al., 2002; Ariño and Reuer, 2004).

The completeness of initial contracts has also been linked to posterior governance changes. Clear, unambiguous collaborative objectives and performance guidelines established at the time of creation are believed to support the development of network trust and thus lead to a reduced need to restructure governance mechanisms (Reuer and Ariño, 2002). On this matter, in an empirical research covering 71 alliances of 63 companies in different industries, Reuer and Ariño (2002) find that relationships with more detailed contractual safeguards are less likely to experience contractual negotiations.

A contrasting view is offered by Inkpen and Currall (2004) who argue that more extensive use of formal controls and safeguards will slow down the development of trust in relationships and hence slow down the introduction of informal mechanisms of coordination, which in turn will impact the likelihood of re-negotiations. The lack of specific safeguards can also be purposeful as when firms implement simple and flexible contracts and then alter them as the collaboration progresses and more information is obtained (Bleeke and Ernst, 1991).

Though the scope of cooperation must be tightly tailored to areas of mutual interest thus ensuring appropriate boundaries to the cooperation, Doz (1987) argues that these boundaries need to be flexible enough to accommodate eventual changes in scope. Governance mechanisms set up in the beginning of a relationship can also include the agreement to mutually adapt to unpredictable contingencies as they arise (Ring and Van de Ven, 1994; Thorelli, 1986).

Another initial condition in a relationship is determined by the total and relative relationship experience of actors involved in the network. An organization, as an accumulation of people, resources, and administrative routines involved in a network, would contribute to building an expertise that helps in the design and management of future networks (Gulati, 1995a) as firms with significant alliance experience should be able to be clearer and more specific on the roles and responsibilities of the network (Reuer et al., 2002). A caution on the relevance of experience is that while in static settings experience will accumulate into improved decision-making and

performance, positive learning effects are not assured (and can even be counterproductive) in dynamic contexts (Reuer et al., 2002; Cohen and Levinthal, 1990).

Other initial conditions and initial actions are also brought up in certain articles as a key determinant of how the relationship will evolve in the future. Doz's (1996) model identifies a set of initial conditions (task definition, partners' routines, interface structure and expectations) that facilitate or hamper learning on five dimensions (environment, task, process, skills and goals), and this in turn leads to re-adjustments and revised conditions in the relationship. In this article Doz goes on to suggest that strong institutional anchors between the individual managers and the partner firms support the development of trust because they provide managers with a safety net and a willingness to step out of roles. Ariño and de la Torre (1998) go as far as to say that 'if these [initial conditions] are wrongly configured, no amount of relationship building will compensate for their mis-specification' (Ariño and de la Torre, 1998, p.322).

The first steps in a relationship can also be considered as part of the initial conditions. Doz (1996) argues that what is accomplished early in building quality into a cooperation process may be more important than the outputs the process actually achieves early and that small events early in the alliance have a disproportionate importance in establishing, or not, a self-reinforcing cycle of heightened efficiency expectations, greater institutions and personal trust and commitment, joint sense-making and learning, and greater flexibility and adaptability.

Changes in external conditions:

Environmental changes affect the dynamics of alliances by altering the firm's assessment of the alliance value (Zajac and Olsen, 1993) or by bringing new opportunities of learning and contributing to new adjustment cycles (Doz 1996).

Case-based research by Doz (1996) and Ariño and de la Torre (1998) suggest a relationship between environmental changes and re-negotiation of alliance conditions, though a later empirical research based on the study of 71 alliances by Reuer and Ariño (2002) doesn't find empirical support for this stated relationship between environmental changes and contractual alterations.

Attitudes and behaviours:

An important influence on the evolution of a relationship is the set of attitudes and behaviours the partners have towards it. Of these, trust among the partners and commitment to the relationship are the two that are most referred to in the literature.

Trust exists when 'one party has confidence in an exchange partner's reliability and integrity' (Morgan and Hunt, 1994, p. 23). It can refer to a type of expectation that alleviates the fear that one's exchange partner will act opportunistically (Bradach and

Eccles, 1989). The concept is also adopted by management theory that asserts that trust, goodwill and commitment are vital in alliances of all kinds (Killing, 1983), and by the stakeholder theory where mutually trusting and cooperative relationships between a corporation and its stakeholders are seen as critical to the success of these relationships (Morgan and Hunt, 1994).

Trust in a relationship reduces the development of opportunistic intentions and therefore makes possible more complex inter-firm division of labour and interdependence than would be predicted by the transaction costs theory (Powell, 1990; Gereffi et al., 2005; Thorelli, 1986; Jarillo, 1988) and, as a self-regulating verification system, it can eliminate or reduce the need for structural control mechanisms (Granovetter, 1985). Trust built on the basis of interpersonal relationships can also help when the business is under stress by becoming a 'safety net' that protects the alliance from self-destruction or major re-negotiation when the business is under-performing or when expectations are not being realized (Spekman et al., 1998a).

Trust has also been interpreted as positive 'knowledge based trust' (Shapiro et al., 1992 cited by Gulati, 1995) when there are strong cognitive and emotional bases for such trust vs. 'deterrence based trust' (Shapiro et al., 1992 cited by Gulati, 1995; Ring and Van de Ven, 1989) when untrustworthy behaviour by a partner can lead to costly sanctions that exceed any potential benefits that opportunistic behaviour may provide.

The second mediating variable in Morgan and Hunt's theory is that of commitment, where each party believes the relationship is worth working on to ensure that it endures indefinitely (Morgan and Hunt, 1994, p. 23).

Commitment can be classified as either attitudinal or instrumental (Gundlach et al., 1995). Attitudinal relates to affective commitment, psychological attachment and value congruence (O'Reilly and Chatman, 1986 cited by Gundlach et al., 1995). Instrumental, on the other hand, is linked to the transaction cost economics view and has to do with the pledges, credible commitments and idiosyncratic investments and the allocation of resources that become specific or dedicated to a relationship (Williamson, 1985; Anderson and Weitz, 1992). Pledges have the effect of displaying a willingness to continue the relationship and bind the firms to the relationship. A workflow interdependence between two firms with a mutual interest can also stimulate commitment in a value creating relationship (Wilson, 1995). Long-term orientation can also be identified as a form of trust or commitment to the relationship (Ganesan, 1994). In a survey of 124 retail buyers and 52 vendors, Ganesan (1994) concludes that credibility and not benevolence is a predictor of long-term orientation, and that the dependence of a retailer on a vendor is positively related to the retailer's longer-term orientation. The same research concludes that satisfaction with past outcome does not have a significant effect on a vendor's benevolence or credibility, but that a vendor's perception of retailers and Transaction

Specific Investments do have a positive effect on a vendor's perception of a retailer's dependence.

Beyond trust and commitment, long-term orientation, flexibility and adaptation are mentioned by certain authors (Ganesan, 1994; Lewin and Johnston, 1997; Metcalf et al., 1992) and relationship quality is a term used to encompass a broad set of attitudes and behaviours that can enhance (or diminish) the relationship dynamics. For example, tension can arise from poor planning, poor execution or boundary definitions and/or management difficulties (Spekman et al., 1998a). Procedural issues are also critical in creating a positive climate and building mutual trust (Doz, 1996; Ring et al., 2005). Preventive process mechanisms can help overcome future difficulties in the relationship due to initial conditions. For example, lack of experience with shared governance may make it even more important to institute conflict resolution mechanisms that will promote positive renegotiation loops and enhance relation quality (Ariño and de la Torre, 1998).

Strong two-way communication, with honest and open lines of communication, has also been identified as a key element of successful conflict prevention and conflict resolution (MacNeil, 1981; Cummings, 1984). If cultural distance is an issue in the relationship, attempts to address cultural obstacles in an explicit and integrative manner should lower the potential for conflict (Kale et al., 2000). Additionally, satisfactory conflict resolution can be used to increase mutual trust and reinforce each member's commitment and confidence (Adobor, 2006; Thorelli, 1986) and has been positively associated with more successful partnerships (Mohr and Spekman, 1994).

Yet another behaviour that is alluded to in the literature is that of flexibility. Ivens (2005) refers to flexibility as 'an actor's capability of reacting to another actor's demand for modifications in a flexible manner, the actor's willingness to do so, and the actual behaviour the actor shows'. In his research Ivens finds that a service provider's flexibility in long-term business relationships positively influences customer satisfaction, customer trust and customer commitment. It is also linked to the commitment dimension presented before in this section.

In summary, trust and commitment are linked in the literature as two potential sides of the same coin whereby a long-term and trusting attitude can be a result of a positive feeling of trust and/or reinforced by mutual commitments that can be represented as pledges. Trust is not only an input to the relationship but is also reinforced by the manner in which inter-firm interaction is organized and trust-building activities are carried out (Gulati, 1995a; Bryson et al., 2006). Beyond having a direct impact on the relationship, levels of trust and commitment have been found to affect adaptive behaviour and adaptation, and these in turn 'feed back' into increased trust and commitment (Brennan and Turnbull, 1999).

As a summary, Table 2-15 presents selected authors' approach to factors impacting the evolution of governance mechanisms and the forms that these mechanisms take over time.

Table 2-15: Factors impacting the evolution in governance mechanisms

Authors	Initial conditions and governance mechanisms	Evolution of conditions and impact on governance mechanisms
Ariño and de la Torre (1998)	<p>Initial expectations of efficiency and equity.</p> <p>Initial relational quality (based on previous personal bonds and institutional reputation).</p> <p>Uncertainty about partners, state of nature and venture.</p> <p>Decision rules on functional areas.</p>	<p>Changes that impact evaluation on equity and efficiency and uncertainty:</p> <ul style="list-style-type: none"> • Execution of commitments • Learning • Conflict resolution • External changes • Relationship quality • Learning-action-reaction loops <p>Conditions can be adjusted to restore efficiency and/or equity but there may also be unilateral reactions or the dissolution of the relationship if balance cannot be restored.</p>
Doz (1996)	<p>Initial conditions determine whether and how learning takes place between partners:</p> <ul style="list-style-type: none"> • Task definition • Partners' routines • Interface structure • Expectations of performance, behaviour and motives 	<p>Learning about environment, tasks, processes, skills and goals allow re-evaluation of efficiency, equity and adaptability leading to revised conditions.</p> <p>Successful alliances engage in iterative and interactive learning cycles over time, with greater trust, adaptive flexibility and commitment.</p> <p>Failure may occur if initial conditions block or delay learning or do not foster joint learning.</p>
Heide and John (1992)	<p>Safeguarding against opportunistic behaviour and investment of specific assets.</p> <p>Governance mechanisms include contracts and Transaction Specific Investments.</p>	<p>Increased presence of supportive norms provides confidence.</p> <p>Norms may eventually enable a buyer to establish control independent of contracts</p>
Inkpen and Currall (2004)	<p>Expectations on trustworthiness of partner (competence and benevolence) influence decision on control mechanisms.</p> <p>Clarity of collaborative objectives and performance guidelines foster initial development of trust.</p> <p>Social controls play a larger role when initial trust is high.</p> <p>Extensive initial use of formal control can slow down development of trust, while formal controls that create structure assurance will foster development of trust.</p>	<p>Trust, control and learning (partner and venture) co-evolve in the relationship.</p> <p>Social control complements formal control as trust and learning about partner and venture increases.</p> <p>Imbalanced learning leading to shift in bargaining power can lead to increased formal controls.</p>
Ring and Van de Ven (1994)	<p>Expectations about motivations, investments.</p> <p>Uncertainty about future states of nature and behaviour of partners.</p> <p>Bargaining process includes process of sense making.</p>	<p>Execution of commitments through role interactions and personal interactions.</p> <p>Continuous sense making and formal bargaining.</p> <p>Supplemental agreements are established to deal with misunderstandings, conflicts and changing</p>

Authors	Initial conditions and governance mechanisms	Evolution of conditions and impact on governance mechanisms
	Governance through formal legal contracts and informal psychological contracts.	expectations. High commitment relationships increasingly governed by informal, psychological contracts.

2.8 Synthesis

Network relationships have attracted significant attention from academics and managers in multiple fields such as organization studies, management, political science and sociology and psychology. The 104 articles that were selected for this review, in addition to the 133 additional sources that were consulted for specific topics, demonstrated a substantial amount of research done on the area of creation and, to a lesser extent, evolution of networks.

The review found that some areas, such as the motivations to form networks, have been extensively covered in the literature while others, such as the dynamics of governance mechanisms, have been less present or have resulted in occasional contradictory views on the subject.

This Section summarizes the findings of the review, contrasting these with the questions driving the research and identifying gaps and opportunities for further research. As presented in the Introduction to this chapter (Section 2.1) the three research questions guiding the Systematic Literature Review were the following:

- How and why are networks created?
- How are initial governance mechanisms defined?
- How and why do governance mechanisms evolve over time?

2.8.1 How and why are networks created?

The review covered three topics related to the creation of networks: 1) actors' motivations; 2) the role of the external and internal contexts; and 3) relationship-specific factors.

Among these, the study of motivations to create networks was the more extensively covered subject. As expected, on the basis of previous literature searches on the topic, Transaction Cost Economics represented a dominant view. In its pure view, establishing closer relationships with other organizations is motivated by the pursuit of efficiencies by lowering transaction costs in situations of bounded rationality, future uncertainty and risk of opportunism (Williamson, 1975; Williamson, 1979; Coase, 1937). Though it was the dominant view in the literature, seven additional perspectives on motivations were found: increasing the total benefit-cost ratio (Dwyer et al., 1987; Scanzoni, 1979; McWilliams and Siegel, 2001); accessing

resources not otherwise available (Das and Teng, 2000; Barney, 1991; Pfeffer and Salancik, 1978; Di Maggio, 1986); increasing market power (Hamel et al., 1989; Porter, 1985; Porter, 1980); increasing legitimacy with markets or societies (DiMaggio and Powell, 1983; Baum and Oliver, 1991; Dacin et al., 2007); managing of relationships with stakeholders (Freeman, 1984; Evan and Freeman, 1983; Donaldson and Preston, 1995); dealing with a large cross-sector challenge (Bryson et al., 2006; Subramanian et al., 2006); and resulting from interpersonal exchanges that might not be purely economically motivated (Blau, 1964).

A number of possible motivations are mentioned in the literature. Although for the most part the literature reviewed presented the precedents to network creation as dominated by one type of motivation, it has already been established that most organizations can have different and non-mutually-exclusive reasons to engage in networks (Barringer and Harrison, 2000; Contractor and Lorange, 1988). The fragmentation in the literature has been frequently observed and commented on (Contractor and Lorange, 1988) and efforts to integrate views across these different perspectives have been done by some authors. For example, Oliver's (1990) identification of necessity, asymmetry, reciprocity, efficiency, stability and legitimacy as six crucial contingencies of relationship formation goes in this direction by integrating multiple views and identifying situations when each would predominate.

The review of the external context can be grouped in two main areas: the economic, legal and institutional environment surrounding the relationship on one side, and the web of relationships in which the organizations are embedded on the other. Though Granovetter's (Granovetter, 1985) concept of embeddedness refers to all these factors, different areas of literature address the topic from diverse perspectives. Management and supply chain literature refer to external context factors such as globalization trends and speed of technology evolution (Lamming et al., 2000; Ring et al., 2005), uncertainty on market and technology evolution (Gulati and Gargiulo, 1999; Williamson, 1975), or absent or insufficient regulation (Lenox and Nash, 2003) as positively impacting the propensity of organizations to form networks. Though different authors emphasize varied external factors, the review didn't find areas of contradiction in the literature and there appeared to be agreement in identifying more turbulent, fast changing and uncertain environments with an increased tendency to establish networks and as an influence in the choice of partners.

Focusing on the relationship network as part of the external context, authors associated with the social network theory assert that embedded relationships accumulate into a network which thus becomes a growing repository of information on the availability, competencies and reliability of prospective partners and that firms placed in a social network of trusting relationships can significantly reduce their search for new partners when they decide to ally with an entity they already trust (Granovetter, 1985; Gulati, 1995a). The social networks within which organizations are embedded can also shape network relationships by influencing which companies will enter alliances (Powell et al., 1996; Gulati, 1998; Gulati, 1999), which companies

are more likely to create ties with each other (Gulati, 1995b; Gulati and Gargiulo, 1999), and how these dyadic relationships will develop (Häkansson and Ford, 2002). Context factors specific to the organizations in the relationship have also been identified as factors enhancing or deterring the creation of a network. Organizational factors such as compatible organizational structures and cultures (Ellram and Edis, 1996; Lambert et al., 1999), relational experience (Gulati and Gargiulo, 1999), decision-making processes (Fey and Beamish, 2000) within each organization, and pre-existing relationships between the partners (Gulati, 1995a) are believed to favour the creation of networks.

The research also analyzed the role of the internal context as a factor in the creation of networks. This was covered much less extensively than the motivations or the role of the external context and factors mentioned in the literature as organization characteristics or capabilities that would support the creation of networks included the organization's capability to learn (Hamel, 1991), its absorptive capacity (Cohen and Levinthal, 1990), the experience in creating and managing alliances (Gulati and Gargiulo, 1999) and the level of engagement of top management (Powell, 1990; Anderson and Weitz, 1992; Ellram and Hendrick, 1995).

2.8.2 How are initial governance mechanisms defined?

The initial conditions that are defined after a negotiation phase can include the definition of the scope of the relationship, the activities and resources committed to the relationship by each organization and the initial governance mechanisms that will support the coordination of activities, roles, relationships and decision mechanisms. Among these, the review questions focused on the choice of governance mechanisms as an area of research.

A range of governance mechanisms can be employed to sustain inter-organizational cooperation (Grandori and Soda, 1995), including formal mechanisms such as the specific set of contracts and obligatory arrangements (Ellram and Edis, 1996), the legal structure used to govern the relationship (Nassimbeni, 1998), and informal mechanisms such as the implicit norms of behaviour (Heide and John, 1992; MacNeil, 1981). The four factors mentioned in the literature as favouring the dominance of formal mechanisms were: 1) when there are investments in assets that are highly specific (Williamson, 1979; Reuer and Ariño, 2007), 2) when there is risk of opportunistic behaviour (Williamson, 1979; Anderson and Weitz, 1992; Hennart, 1988); 3) when the activities in the network entail high complexity of information (Gereffi et al., 2005); or 4) when knowledge-based or other intangible resources are shared (Kogut, 1988).

An additional factor, the role of uncertainty, was not dealt with consistently in the literature and, in some cases, the conclusions of different authors were contradictory. A traditional view of uncertainty, promoted by Transaction Cost Economics Theory, is that increased level of environmental and behaviour uncertainty (Williamson, 1991; Williamson, 1985) would favour use of formal mechanisms of coordination. However,

empirical research shows mixed results on the effects of environmental uncertainty (David and Han, 2004; Coles and Hesterly, 1998, cited by Koenig and Mellewigt 2006). Also, authors like Viaar et al. (Viaar et al., 2006) propose that formalization can be used as a means to make sense of the partners and lower uncertainty by focusing attention, provoking articulation and instigating interaction, and reducing judgment error.

The relationship between uncertainty and governance mechanisms appears to be, as expressed by Koenig and Mellewigt (2006), still a 'theoretical and empirical puzzle'. Compared to other areas in the network literature, theoretical positions can contradict one another and the empirical research has not yet been conclusive.

Another limitation in the literature was its coverage of governance mechanisms in multi-actor networks as most of the literature focuses on governance mechanisms in dyadic relationships. Among the papers that were identified for the review, the ones that addressed multi-actor networks focused either on the creation of such networks, such as Ring, Doz and Olk's (2005) paper on R&D consortia, or addressed the topic at a high level as was the case of Bryson's (Bryson et al., 2006) cross-sector collaboration article. As multi-actor networks have become more prevalent and cross-sector collaboration has also taken a prominent role in management and public sector literature (Gray, 1996; Senge et al., 2006), understanding the governance mechanisms of these networks and the variables that drive the mix of formal and informal mechanisms was identified as an area that would benefit from further research.

2.8.3 How and why do governance mechanisms evolve over time?

The third question in the research explored the evolution in the mix between formal and informal mechanisms of coordination in networks and the drivers that influence this evolution. Though literature on the dynamics of networks is significantly more limited than the literature focused on the creation and performance aspects of networks, 12 articles were identified in the initial review and over 10 additional documents through specific cross-referencing. However, the limited research that exists on this area of network dynamics limits deriving any conclusions from the review.

The articles that were reviewed, however, showed similarities in identifying possible trajectories of the relationship as it relates to governance mechanisms. Relationships can go on a 'virtuous' cycle: as positive interactions and trust reinforcement take place, the relationship will tend to depend more on informal governance mechanisms and less on contracts and formal ones (Ring and Van de Ven, 1994). In the early stages of a buyer-seller relationship, norms may not be fully established and a buyer may rely on contractual protections but, as the relationship develops, 'supporting norms may evolve and eventually enable a buyer to establish control' (Heide and John, 1992p. 42). Inkpen and Currall (2004) also agree that 'learning about the joint

venture partner increases the likelihood that partner firms will reduce their emphasis on formal joint venture controls' (2004p. 593).

A 'vicious' cycle can also occur when (internal or external) sources of tension arise that make the formal mechanisms inadequate. Ring and Van de Ven (Ring and Van de Ven, 1994) propose that supplemental agreements are generally established to deal with misunderstandings or conflicts, whilst informal, psychological contracts can become more prevalent in relationships as partners become more committed to each other and to the relationship. Ariño and de la Torre (1998) study a longitudinal case of a failed alliance and propose that external shocks and evolution of relationship quality causes them to either engage in re-negotiation of the terms of the contract or modify their behaviour unilaterally. These moves to readjust the respective contributions and the alliance's distribution rules will continue until there is a new equilibrium or the relationship is dissolved.

In summary, three observations emerge from the review. First, external environmental shocks were found to be an important variable in determining re-negotiation of conditions in one case-based research (Doz, 1996; Ariño and de la Torre, 1998) but were not found to be significant in a subsequent quantitative research (Reuer and Ariño, 2002). Additional research could specifically address this question. Second, the evolution to more informal mechanisms is treated in the literature as a positive development of relationships, with increased trust and lower need of contractual relationships, while the introduction of new formal mechanisms of coordination is associated with a negative development of the relationship and the need to 'correct' it in some way. Third, it is unclear from the review if more extensive controls and mechanisms of coordination in the beginning of the relationship impact favourably or not the evolution of these governance mechanisms. On one side, some authors argue for initial flexibility to allow the mechanisms to be adapted to evolving circumstances (Bleeke and Ernst, 1991) and that extensive use of initial formal agreements will slow down the development of informal relationships (Inkpen and Currall, 2004), while a different view argues that clear, unambiguous collaborative objectives and performance guidelines established at the time of creation will support the development of trust and thus lower the need for restructuring governance mechanisms (Reuer and Ariño, 2002).

2.8.4 Revised research model

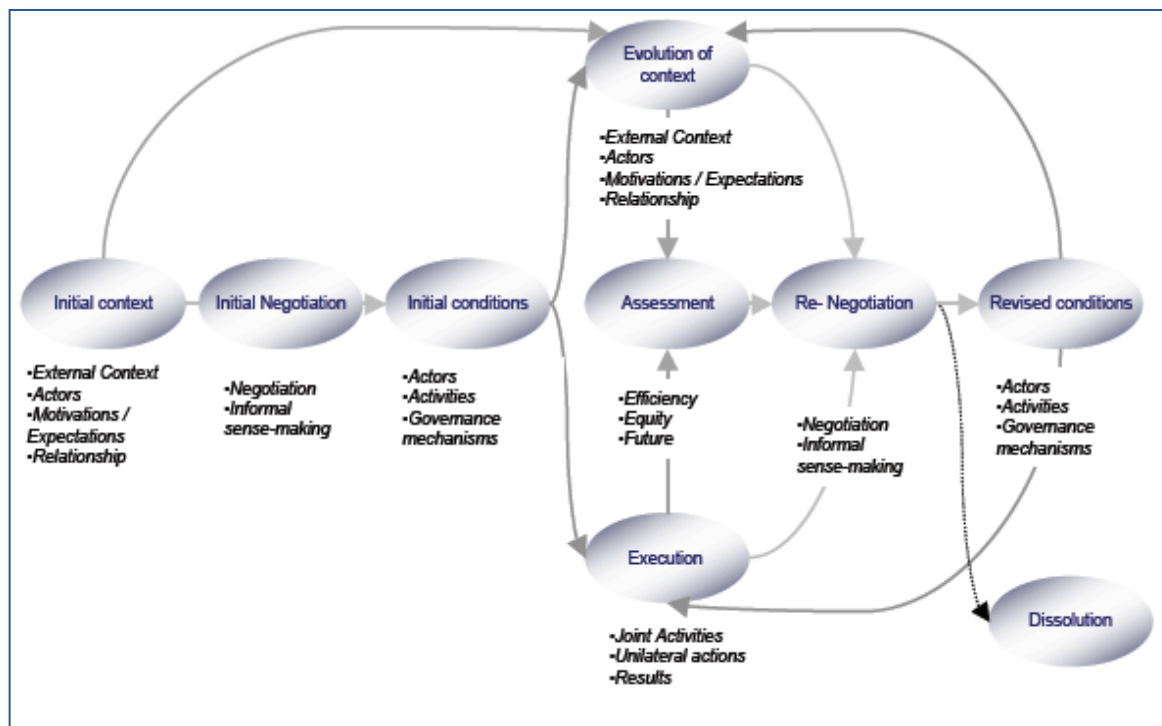
Building on the initial research model proposed in Section 1.7 and the results from the literature review, a revised framework to study the creation and evolution of networks is presented in Figure 2-11.

The basic premise of the framework remains the same in that there is a creation phase where internal and external context variables influence the creation of networks and the determination of network conditions, including governance mechanisms. As the context conditions evolve and the relationship also develops,

revised conditions are negotiated and a new cycle begins or, otherwise, the relationship is discontinued.

Based on the review of the literature, the framework now includes a specific negotiation stage as a process step between the factors influencing the creation of a network and the actual conditions of the initial network. This negotiation phase occurs again as the relationship evolves and, as Smith Ring and Van de Ven propose, as a 'repetitive sequence of negotiation, commitment and execution stages, each of which is assessed in terms of efficiency and equity' (Ring and Van de Ven, 1994, p. 97).

Figure 2-11: Proposed framework to study the creation and evolution of networks



The revised model also includes the evolution of context factors and unilateral actions as part of the dynamics in the execution of the network, in line with the model proposed by Ariño and de la Torre (1998). Overall, the model includes a creation phase and an iterative evolution phase. The initial phase is influenced by external and internal context factors and includes a process of negotiation and definition of initial conditions. As the relationship evolves, changes in the context and results of the execution are assessed by the network participants and a new negotiation process occurs. This in turn leads again to revising the conditions of the relationship or to dissolution of the relationship.

The model is mainly a descriptive tool and can be used to frame the identified opportunities for further research and the contributions to theory and to practice made by this paper.

2.8.5 Summary of research questions and findings

As a summary of the findings, Table 2-16 presents the key findings for each of the question and identifies the relevant Section where this was addressed.

Table 2-16: Project questions and findings summary

Question	Research Findings	References in thesis
How and why are networks created?	<p><i>Extensive coverage found in the literature on motivations to form networks, initial governance mechanisms.</i></p> <p>Why are networks created? Precedents to network formation: 1) actors' motivations; 2) the role of the external and internal contexts</p> <p>1) Actors' motivation: Transaction Cost Economics as a dominant view: establishing closer relationships with other organizations is motivated by pursuit of efficiencies lowering transaction costs in situations of bounded rationality, future uncertainty and risk of opportunism (Williamson, 1975; Williamson, 1979; Coase, 1937). Seven additional perspectives on motivations: increasing the total benefit-cost ratio (Dwyer et al., 1987; Scanzoni, 1979; McWilliams and Siegel, 2001); accessing resources not otherwise available (Das and Teng, 2000; Barney, 1991; Pfeffer and Salancik, 1978; Di Maggio, 1986); increasing market power (Hamel et al., 1989; Porter, 1985; Porter, 1980); increasing legitimacy with markets or societies (DiMaggio and Powell, 1983; Baum and Oliver, 1991; Dacin et al., 2007); managing of relationships with stakeholders (Freeman, 1984; Evan and Freeman, 1983; Donaldson and Preston, 1995); dealing with a large cross-sector challenge (Bryson et al., 2006; Subramanian et al., 2006); and resulting from interpersonal exchanges that might not be purely economically motivated (Blau, 1964). Most organizations can have different and non-mutually-exclusive reasons to engage in networks (Barringer and Harrison, 2000; Contractor and Lorange, 1988). Efforts to integrate views across these different perspectives: Oliver's (1990) identification of necessity, asymmetry, reciprocity, efficiency, stability and legitimacy as six crucial contingencies of relationship formation goes in this direction by integrating multiple views and identifying situations when each would predominate.</p> <p>2) Context: Two areas: Economic, legal and institutional environment surrounding the relationship on one side, and the web of relationships in which the organizations are embedded on the other. Though Granovetter's (Granovetter, 1985) concept of embeddedness refers to all these factors, different areas of literature address the topic from diverse perspectives. Management and supply chain literature refer to external context factors</p>	Section 2.8.1

	<p>such as globalization trends and speed of technology evolution (Lamming et al., 2000; Ring et al., 2005), uncertainty on market and technology evolution (Gulati and Gargiulo, 1999; Williamson, 1975), or absent or insufficient regulation (Lenox and Nash, 2003) as positively impacting the propensity of organizations to form networks. Though different authors emphasize varied external factors, the review didn't find areas of contradiction in the literature and there appeared to be agreement in identifying more turbulent, fast changing and uncertain environments with an increased tendency to establish networks and as an influence in the choice of partners.</p> <p>Relationship network as part of the external context: Embedded relationships accumulate into a network which thus becomes a growing repository of information on the availability, competencies and reliability of prospective partners and firms placed in a social network of trusting relationships can significantly reduce their search for new partners when they decide to ally with an entity they already trust (Granovetter, 1985; Gulati, 1995a). Social networks within which organizations are embedded can also shape network relationships by influencing which companies will enter alliances (Powell et al., 1996; Gulati, 1998; Gulati, 1999), which companies are more likely to create ties with each other (Gulati, 1995b; Gulati and Gargiulo, 1999), and how these dyadic relationships will develop (Häkansson and Ford, 2002).</p> <p>Context factors specific to the organizations in the relationship have also been identified as factors enhancing or deterring the creation of a network. Organizational factors such as compatible organizational structures and cultures (Ellram and Edis, 1996; Lambert et al., 1999), relational experience (Gulati and Gargiulo, 1999), decision-making processes (Fey and Beamish, 2000) within each organization, and pre-existing relationships between the partners (Gulati, 1995a) are believed to favour the creation of networks.</p> <p>Internal context factors mentioned in the literature: organization characteristics or capabilities that support the creation of networks included organization's capability to learn (Hamel, 1991), absorptive capacity (Cohen and Levinthal, 1990), experience in creating and managing alliances (Gulati and Gargiulo, 1999) and level of engagement of top management (Powell, 1990; Anderson and Weitz, 1992; Ellram and Hendrick, 1995).</p>	
	<p>How are networks created?</p> <p>Differences in the scope of which activities and processes are considered within the creation phase of a network, most authors agree that it includes elements such as partner identification and selection, individual and joint expectation creation, negotiations and commitments.</p> <p>Partner identification and selection:</p> <p>Life-cycle approach identifies specific steps that network creation processes follow. Dwyer et al. (1987) and Scanzoni (1979) include in their models moments of attraction, communication and bargaining, development and exercise of power, norm development, and expectation development. Ellram and Edis (1996) also propose specific processes: Establishing strategic</p>	<p>Section 2.7.5</p>

	<p>needs, forming an internal team and confirming top management support1); 2) Identifying potential partners – Including benchmarking best practices, determining selection criteria and identifying potential partners; 3) Screening and selecting - Contacting potential partners, reviewing proposals, evaluating suppliers and reaching a decision; 4) Establishing the relationship.</p> <p>Gulati (1998) presents the concept of embeddedness as a main driver in the identification of potential partners as ‘actors who share direct connections with each other are likely to possess more common information and knowledge of each other’. Information on the availability, needs and requirements, and reliability of those partners would then be dependent on the networks in which it operates. The embeddedness of firms in networks and their structural position in them would then influence the extent to which firms have access to information about potential partners and the attractiveness of such potential partners.</p> <p>Smith Ring et al. (Ring et al., 2005) distinguish three alternative processes that occur in network formation: ‘emergent process’ pulled by the strength of mutual interest, even if social and strategic relationships are weak, ‘engineered process’, with a key design role for the triggering entity, and ‘strong social relationships process’ already embedded in a relationship, making the actors aware of strategic interdependencies.</p> <p>Sense making and negotiation: The network creation process also identifies a process of approaching the partner, making sense of the value of the relationship and the reliability of the partner, and developing joint agreements about activities, resources and the mechanisms that will govern the relationship.</p> <p>Two differing views on this process have to do with the time and the scope of the relationship: 1) gradual approach to networks that begins with small, informal deals and which initially requires little reliance on trust because it involves low risk (Ring and Van de Ven, 1994; Van De Ven, 1976) In the buyer-seller literature, Ford (1980) identifies such gradual development of a relationship with an intermediate stage where negotiation of a sample delivery can take place; 2) negotiation as a formal bargaining process that takes place at a specific point and over possible terms and procedures of a potential relationship’ (Ring and Van de Ven, 1994, p. 97).</p> <p>Approach chosen also dependent the circumstances of the relationship. Parties decide the extent, in terms of length and intensity, to which they want to take their formal bargaining processes (Ariño and Reuer, 2004; Vlaar et al., 2006). This will depend on factors such as the threat of opportunistic behaviour, the level of investment required (Parkhe, 1993b), the strategic importance of the alliance (Gomes-Casseres, 1996) and its projected duration (Crocker and Reynolds, 1993, cited by Ariño and Reuer, 2004).</p> <p>A series of factors has also been identified in the literature as supporting or deterring the processes leading to successful creation of networks: developing a shared purpose (Huxham and Vanghen, 2005), achieving</p>	
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	<p>pragmatic, operational and moral meaning (Kumar and Anderson, 2000).</p> <p>After a negotiation phase, parties agree on the obligations and rules for future action in the relationship (Ring and Van de Ven, 1994), entering a collaborative agreement that incorporates formal/contractual aspects as well as a set of norms and ‘psychological’ or informal contracts, and which defines the conditions of the collaborative agreement: activities and linkages, resources, and governance or coordination mechanisms.</p>	
How are initial governance mechanisms defined?	<p><i>Extensive coverage found in the literature on initial governance mechanisms.</i></p> <p>A range of governance mechanisms can be employed to sustain inter-organizational cooperation (Grandori and Soda, 1995), including formal mechanisms such as the specific set of contracts and obligatory arrangements (Ellram and Edis, 1996), the legal structure used to govern the relationship (Nassimbeni, 1998), and informal mechanisms such as the implicit norms of behaviour (Heide and John, 1992; MacNeil, 1981).</p> <p>Four factors mentioned in the literature as favouring the dominance of formal mechanisms: 1) when there are investments in assets that are highly specific (Williamson, 1979; Reuer and Ariño, 2007), 2) when there is risk of opportunistic behaviour (Williamson, 1979; Anderson and Weitz, 1992; Hennart, 1988); 3) when the activities in the network entail high complexity of information (Gereffi et al., 2005); or 4) when knowledge-based or other intangible resources are shared (Kogut, 1988).</p> <p>Another limitation in the literature was its coverage of governance mechanisms in multi-actor networks as most of the literature focuses on governance mechanisms in dyadic relationships.</p>	Section 2.8.2
	<p><i>Gaps/contradictions identified in context conditions (role of uncertainty)</i></p> <p>Role of uncertainty not dealt with consistently in the literature and, in some cases, the conclusions of different authors contradictory. Following Transaction Cost Economics Theory, an increased level of environmental and behaviour uncertainty (Williamson, 1991; Williamson, 1985) would favour use of formal mechanisms of coordination. However, empirical research shows mixed results on the effects of environmental uncertainty (David and Han, 2004; Coles and Hesterly, 1998, cited by Koenig and Mellewig 2006). Also, authors like Vaar et al. (Vaar et al., 2006) propose that formalization can be used as a means to make sense of the partners and lower uncertainty by focusing attention, provoking articulation and instigating interaction, and reducing judgment error.</p>	Section 2.8.2
How and why do governance mechanisms evolve over time?	<p><i>Gaps identified in the evolution of governance dynamics.</i></p> <p>Relationships presented as going through a ‘virtuous’ cycle or ‘vicious’ cycle: as positive interactions and trust reinforcement take place, the relationship will tend to depend more on informal governance mechanisms and less on contracts and formal ones (Ring and Van de Ven, 1994). Buyer may rely initially on contractual protections but, as the relationship develops,</p>	Section 2.8.3

	<p>‘supporting norms may evolve and eventually enable a buyer to establish control’ (Heide and John, 1992p. 42). Inkpen and Currall (2004) also agree that ‘learning about the joint venture partner increases the likelihood that partner firms will reduce their emphasis on formal joint venture controls’ (2004p. 593). A ‘vicious’ cycle can also occur when (internal or external) sources of tension arise that make the formal mechanisms inadequate. Supplemental agreements are established to deal with misunderstandings or conflicts (Ring and Van de Ven, 1994). External shocks and evolution of relationship quality causes them to either engage in re-negotiation of the terms of the contract or modify their behaviour unilaterally (Ariño and de la Torre, 1998).</p> <p>External environmental shocks found to be an important variable in determining re-negotiation of conditions in one case-based research (Doz, 1996; Ariño and de la Torre, 1998) but not found to be significant in a subsequent quantitative research (Reuer and Ariño, 2002).</p> <p>Unclear from the review if more extensive controls and mechanisms of coordination in the beginning of the relationship impact favourably or not the evolution of these governance mechanisms. On one side, some authors argue for initial flexibility to allow the mechanisms to be adapted to evolving circumstances (Bleeke and Ernst, 1991) and that extensive use of initial formal agreements will slow down the development of informal relationships (Inkpen and Currall, 2004), while a different view argues that clear, unambiguous collaborative objectives and performance guidelines established at the time of creation will support the development of trust and thus lower the need for restructuring governance mechanisms (Reuer and Ariño, 2002).</p>	
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2.8.6 Limitations

Systematic Review distinguishes itself from other types of literature review by adopting a ‘replicable, scientific and transparent process that aims to minimize bias through exhaustive literature search of published and unpublished studies and by providing an audit trail of the reviewer’s decisions, procedures and conclusions’ (Cook et al., 1997 cited by Tranfield et al. 2003). Implementation of the process in connection with the topic of network creation and evolution, however, is restricted by certain limitations. Two important limitations referred to the scope of the study and the technical limitations of the search process.

A first limitation in the review is the limited coverage of sustainable sourcing networks, the original object of study. While sustainable sourcing started as being a central theme in the research, it became obvious early on that the literature on the topic is still at its very early stages and, with notable exceptions (Gereffi et al., 2005; Gereffi, 1994; Roberts, 2003), it does not address the issues of inter-organizational relationships, linkages or governance structures. Broadening the topic to all inter-

organizational networks expanded significantly the scope of study but it was based on the assumption that literature on dyadic and multi-actor networks can adequately inform and set the base for future empirical research on sustainable networks.

A second limitation is imposed by the vastness of the topic of networks and the different fields that cover the subject. Besides the volume of information, each area addresses networks from a different perspective and uses specific language. The search for keywords proved to be a complex part of the process due to the wide divergence in terminology used by different areas of literature. Even in the same field, different authors employ diverse terms to refer to the same phenomena. For example, what this review defines as inter-organizational network relationships is also referred to by different authors as alliances, joint ventures, inter-firm networks, buyer-seller relationships, inter-organizational relationships, consortia and collaborative arrangements. To try to incorporate all this into an electronic database search is a challenging undertaking. It proved impossible to implement in one of the databases (ProQuest) and suboptimal for the one that was used (EBSCO). This limitation, however, was mitigated by the complementary data sources used, namely the documents identified in previous doctoral research, cross-referenced articles and a search through relevant journals and specific authors.

2.8.7 Future research opportunities

A number of possible paths for extending the research and contributing to build theory have been identified in the thematic analysis and in the synthesis section. Among these, due to their relevance to the topic studied and the identification of a clear gap or contradiction in the literature, four specific areas of extension can be proposed: 1) the relationship between environmental and relationship uncertainty and governance decisions; 2) the evolution of governance mechanisms and the mix of formal and informal mechanisms over time; 3) the role of power as a factor in determining governance mechanisms; 4) the selection of governance mechanisms in multi-actor networks.

The first topic, the relationship between uncertainty and governance decisions was one of the subjects explored in this research. The conclusions, however, indicate that it is an area where there is limited consensus and where an increased use of formal mechanisms (Williamson, 1991; Williamson, 1985), at least in the case of environmental uncertainty, is not supported by findings of empirical research (David and Han, 2004; Coles and Hesterly, 1998, cited by Koenig and Mellewigt 2006).

The second topic identified refers to the evolution of the mix of governance mechanisms over time. As it was discussed in the synthesis of the findings, there appears to be a common view that the introduction of formal mechanisms acts as an element that seeks to fix a relationship, to re-establish balance (Ariño and de la Torre, 1998) or to deal with misunderstandings or conflicts (Ring and Van de Ven, 1994). The single differing point of view, found only in one article reviewed, presented a conceptual development of formalization as an opportunity to provide clarification

(Viaar et al., 2006). As this implies a very different use of governance mechanisms, the topic merits further research and exploration through empirical research.

The third topic proposed, the role of power in the definition of governance mechanisms, was identified but not explored in depth in this research. The articles that were reviewed as part of the research identified the degree of symmetry as a factor in the balance of control mechanisms, with a high degree of symmetry coinciding with contracts where informal mechanisms based on trust is the predominant mode of governance (Peck and Juttner, 2000). However, power in a relationship has been related to imbalances of needs (Salancik and Pfeffer, 1977), knowledge (Inkpen and Beamish, 1997) and importance (Gereffi et al., 2005), all areas that have not been explicitly addressed in this research. The question is then how these different sources of power would impact the decisions on governance mechanisms.

Lastly, the fourth area of research proposes further exploration of the use of governance mechanisms in multi-actor networks over time. Though these networks are less prevalent in existing research, cross-sector collaboration is gaining acceptance as a tool for organizations to gain legitimacy, engage with stakeholders and tackle issues that are broader than what a single firm, organization or sector can address. As such, research on how governance decisions are made in such relationships, and how they evolve over time, has an opportunity to make a worthwhile contribution on the topic of network dynamics.

2.9 Conclusion

The literature on networks, and inter-organizational relationships in particular, has been frequently referred to as broad, fragmented and heterogeneous (Barringer and Harrison, 2000; Oliver, 1990), with multiple fields of knowledge contributing to the topic, each from a different perspective.

Integrating the vast literature around the questions that guide this research is therefore a critical step to identifying relevant gaps in the literature and guiding future field research. Because of the fragmentation of the field and the interest of managers in the topic, it could also, as Denyer and Tranfield (Denyer and Tranfield, 2006) suggest, be useful for practitioners by providing ideas, illustrations and recommendations for practice.

The research reviewed existing literature on the topics of creation and dynamics of networks, focusing on reviewing what the literature said on factors influencing the creation of networks, the definition of initial governance mechanisms and the evolution of these governance mechanisms over time.

The methodology used for the review was based on the Systematic Review approach which distinguishes itself from other types of literature review by adopting a 'replicable, scientific and transparent process that aims to minimize bias through

exhaustive literature search of published and unpublished studies and by providing an audit trail of the reviewer's decisions, procedures and conclusions' (Cook et al., 1997 cited by Tranfield et al. 2003).

As a result of the analysis, the review found that some areas, such as the motivations to form networks, have been extensively covered in the literature while others, such as the dynamics of governance mechanisms, have been less present or have resulted in sometimes-contradictory views on the subject. Lastly, specific areas were identified as gaps or contradictions in the literature that merit further research.

2.9.1 Contribution to research

The Systematic Review was designed as a first step in the research to frame future theory development and locate empirical research to be carried out as part of the doctoral research. It nevertheless also resulted in certain specific theory and practice contributions on its own.

By proposing a framework to study the subject and integrating the literature in a conceptual model, the research identified gaps in the literature that can frame further theoretical and empirical research to resolve these issues. The research then extended the integration of multiple disciplinary areas that have contributed to the vast and fragmented field of networks that exists at present by categorizing the seven sources of motivation for the creation of networks and including in these motivations specific ones for the creation of cross-sector networks.

The research contributed to the development of theory by identifying gaps and inconsistencies that exist in the literature, namely in the treatment of uncertainty as a factor influencing the decision of governance mechanisms. Contradictions in the literature also resulted in the research challenging the view that a positive evolution of a relationship must entail governance mechanisms moving towards the use of more informal mechanisms and less formal ones.

2.9.2 Contribution to practice

By its structured approach and the introduction of a comprehensive framework, the research can be used by practitioners as support in understanding the evolution of networks.

The research also integrates a number of normative papers that provide advice on the conditions in which creation of a network is merited and the context factors that should be analyzed in the creation of such a relationship. Further, it integrates guidance on the selection of partners and of appropriate governance mechanisms. An important element in this research is the analysis of networks from a dynamic perspective. For practitioners, the main implication is that governance mechanisms need not to be decided, as much of the literature implies, once and for all in the

beginning of a relationship. Rather, they can evolve as the context and the remaining conditions of the relationship also evolve.

Overall, by identifying the factors involved in the evolution of governance mechanisms, this research contributes to the still nascent field of network dynamics, a research topic that has been 'often called for but rarely chosen' (Salk, 2005) and that sets the stage for interesting further avenues of research.

3 Project 2: Network governance dynamics

3.1 Abstract

Purpose:

Within the context of a sustainable supply chain, this chapter reports on an empirical longitudinal research on network evolution and the dynamics of governance in a multi-stakeholder supply chain sustainability initiative led by Nespresso, the specialty coffee division of consumer products company Nestlé.

Design/Methodology/Approach:

Based on earlier contributions by Ring and Van de Ven (1994), Doz (1996) and Ariño and de la Torre (1998), I propose a framework to study the creation and evolution of governance mechanisms over a five-year period. The research uses data from 48 semi-structured interviews and 15 recent and historic documents. The interviews were conducted among current and past representatives of all the organizations concerned.

Findings:

In contrast with some literature on the subject, it was found that in a context marked by high environmental uncertainty, governance mechanisms initially relied mostly on informal mechanisms. As the programme evolved and expanded in scale, complexity and the number and type of actors involved, formal governance mechanisms were incorporated into the relationship to enable the network to grow and to provide clarity to all actors. Naturally occurring relational quality processes that encouraged increased trust were critical elements in the early phase, and were explicitly built into a second phase of the relationship.

Research implications:

The study concludes by proposing that in a context of high uncertainty and programme experimentation, relational norms based on organizational and interpersonal trust from pre-existing relationships can provide a higher level of flexibility, and that relationship quality processes are critical both during the experimentation phase and during the formalization and expansion phase.

Practitioner implications:

The importance of treating governance mechanisms in the supply chain not as a fixed variable to be determined once and for all in the beginning of a relationship, but rather to adapt the coordination mechanisms to the evolution of environmental and relationship conditions.

3.2 Introduction

The study of inter-organizational networks has attracted growing interest in academic and practitioner literature. Networks, consisting of multiple organizations linked through multilateral ties and connected in ways that facilitate achievement of a common goal (Provan et al., 2007), have been presented as a way to reduce transaction costs (Williamson, 1975; Cavinato, 1992; Williamson, 1979), to access resources otherwise unavailable (Das and Teng, 2000; Barney, 1991; Pfeffer and Salancik, 1978) or to increase market power (Doz and Hamel, 1998; Porter, 1985; Porter, 1998). However, collaborating with other organizations can be a difficult undertaking, with partners facing difficulties in areas such as lack of staff support (Waddock, 1988), fragility of trust (McEvily et al., 2003) and conflict management (Gray, 1996). As expressed by Huxham and Vangen (2005, p. 13):

Seeking collaborative advantage is a seriously resource-consuming activity so [it] is only to be considered when the stakes are really worth pursuing. Our message to practitioners and policy makers alike is don't do it unless you have to (Huxham and Vangen, 2005).

Academic interest in the subject has resulted in a vast body of literature, with hundreds of articles in academic journals (Barringer and Harrison, 2000) advancing the understanding of what networks are and how they are structured. Review articles like Oliver's (1990), Grandori and Soda's (1995), and more recently Borgatti and Forster's (2003), integrate and summarize perspectives on the creation, operation and impact of inter-organizational networks. Despite progress in the field, the literature has been nevertheless often criticized for offering mostly a static view of the relationship (Barringer and Harrison, 2000) and frequent calls have been made by academics in management literature to study the dynamic aspects of collaboration (Doz, 1996; Parkhe et al., 2006; Salk, 2005; Reuer and Ariño, 2002; Ahuja et al., 2007).

This research responds to this call, addressing two aspects of network dynamics: the role of uncertainty in defining governance mechanisms and the evolution of these coordination or governance mechanisms over time. This is consistent with the observations that 'managing the relationship over time is usually more important than crafting the initial formal design' (Doz and Hamel, 1998, p. XV) and that 'firms make governance decisions in alliances not only at the creation stage but after they have been set up' (Reuer and Ariño, 2002, p.48).

The research focuses on a multi-stakeholder programme in the coffee sector organized by Nestlé's premium coffee subsidiary Nespresso to introduce environmental and socio-economic considerations in the supply chain, i.e. the 'management of raw materials and services from suppliers to manufacturer/service provider to customer and back with improvement of the social and environmental impacts explicitly considered' (New Zealand Business Council for Sustainable Development, 2003). The topic has received significant attention lately but research carried out as late as 1998 concluded that 'only one mainstream beverage company has shown an interest in the social or environmental dimensions of its supply chain'

(Blowfield, 2003). Nespresso's project, as one of the first such supply chains in the coffee world, was developed under conditions of high environmental uncertainty, where corporations were considering a wide spectrum of options from proactive postures involving future regulations and social trends to altering operations, processes and products to prevent negative impacts (Aragon-Correa and Sharma, 2003). The research addresses the key question of what mixture of governance mechanisms is utilized in such a relationship, how and why these evolve over time and what the mediating variables involved are.

In the next section I summarize the existing literature on network governance and propose a model of network evolution that integrates the concepts developed in the literature. A description of the methods used follows, and then a summary of the research findings. Based on analyzing the key findings of the research relative to the existing literature, a series of specific implications for theory and for practitioners is presented. Finally, the last section identifies limitations and presents suggestions for further research on this important topic.

3.3 Theoretical background

The network as a unit of analysis

Networks have become a popular subject of study of relationships spanning across organizational theory, strategic management, business studies, economics and sociology, among others. Theoretical paradigms such as transaction cost economics, resource based view, political economy theory, institutional theory, stakeholder theory, social exchange theory and social network theory approach the topic from different perspectives. One of the important distinctions among these perspectives is the unit of analysis that they focus on. For example, most of Transaction Cost Economics and Resource Based View of the Firm take dyads (relationships between two organizations) as the main unit of analysis. At the other end of the spectrum, social network theory authors study the 'network as a whole' (Borgatti and Foster, 2003; Kilduff and Tsai, 2003; Provan and Milward, 1995), analyzing the structures and processes of the entire network rather than the organizations that compose the network.

For the purposes of this research, the analysis is based on networks that are formally established, governed and goal-directed (Kilduff and Tsai, 2003). It also adopts the network as a whole as the unit of analysis (Provan et al., 2007; Kilduff and Tsai, 2003). It incorporates, however, much of the literature that has originated in the study of dyadic relationships, where most of the study of network governance mechanisms resides (Provan et al., 2007; Kenis and Provan, 2006) and which has informed much of the research on inter-organizational networks.

Network Governance

Coordinating and monitoring the activities of networks is an important aspect of networks that enhances the likelihood of achieving not only organization-level goals

but also network-level objectives (Kenis and Provan, 2006). This research thus refers to network governance as the set of mechanisms that supports and sustains cooperation among participating organizations (Grandori and Soda, 1995) to enhance the likelihood of achieving network-level goals (Kenis and Provan, 2006; Provan and Kenis, 2008)⁷.

The governance of networks can therefore be analyzed from two perspectives. On the one hand, the actual mechanisms used to coordinate networks and, on the other, to what extent the definition of these coordination mechanisms is shared among the different actors or concentrated in a lead organization.

Coordination mechanisms

On the issue of governance mechanisms, a common typology distinguishes between formal and informal coordination mechanisms. Formal mechanisms can take the form of control and reporting systems through which organizations structure their interaction in an explicit way and can include command structures, incentive systems, standard operating procedures and documented dispute resolution procedures (Gulati and Singh, 1998; Dekker, 2004). Relationships, however, also encompass additional coordination mechanisms characterized by informal social systems rather than by bureaucratic structures (Jones et al., 1997; Powell, 1990). As these mechanisms are often not explicit, it can be difficult for a manager or researcher to consciously assess the prevalence thereof in the governance of relationships, but their presence can be identified in self-regulations such as norms (Heide and John, 1992; MacNeil, 1981; Dwyer and Oh, 1988), conventions or standards (Ponte and Gibbon, 2005), and in informal cultures and social bonds among managers (Wilson, 1995; Spekman et al., 1998b).

A dominant theme in management literature deals with identifying the appropriate governance mechanisms under specific factors and conditions. Formal mechanisms have been advocated in conditions of high asset specificity (Williamson, 1979; Williamson, 1985; Wilding and Humphries, 2006), as a protection against opportunistic behaviour (Anderson and Weitz, 1992; Bradach and Eccles, 1989), and to help prevent involuntary sharing of knowledge across organizations (Kogut, 1988).

Informal mechanisms can have a moderating effect on the need for contractual mechanisms when social norms can deter a partner from behaving opportunistically for fear of potential sanctions related to reputation or exclusion (Gulati, 1998; Shapiro et al., 1992), or when increased trust exists among partners. Trust, the expectation that the counterpart will behave in a reliable, predictable and fair manner (Zaheer et al., 1998), can be developed as partners become more committed over time (Doz, 1996), when trust already exists developed from previous transactions with the partner (Gulati, 1995a), and even transferred (McEvily et al.,

⁷ The term network is also often used in the literature as a coordination mechanism in its own right. This research, however, studies networks as an object of coordination and not as a coordination mechanism in itself.

2003) when a third party connects two individuals, therefore closing a 'structural hole'⁸ (Burt, 1992). It can also be used as a main form of governance when monitoring and formal controls are considered difficult and costly (McEvily et al., 2003).

Uncertainty has been frequently mentioned in the literature as having a strong influence on governance mechanisms. But different theoretical perspectives have reached alternative and sometimes even contradictory conclusions on the role that uncertainty plays. A dominant view present in Transaction Cost Economics (TCE) proposes that formal mechanisms of coordination increase control over sources of uncertainty (Williamson, 1991). More recently, authors in TCE have differentiated between environmental uncertainty (lack of knowledge about states of nature and unpredictability of other economic actors' actions) and behavioural uncertainty (future behaviour of the relationship partner), where the classic TCE proposition will support behavioural uncertainty but be less effective as a mechanism to manage environmental uncertainty (David and Han, 2004; Coles and Hesterly, 1998). An alternative view on environmental uncertainty is that of Real Options Theory that stresses the importance of uncertainty and the discretion management has over managing it (Tong and Reuer, 2007). Following this perspective, Folta (1998) argues that less hierarchical and contractual governance forms can provide flexibility to adapt upon the arrival of new information. Bachmann and Zaheer (2008) point to organizations taking a 'leap of faith' when business situations involve 'unknown unknowns' that create complexities that contracts are of little help with.

Though the analysis of individual forms of governance is often found in the literature, it has also been observed that in reality the choice is not necessarily between one mechanism or the other but rather a combination of mechanisms that will govern the interactions among the organizations. Prescribed networks composed of a set of formally specified relationships and emergent networks involving informal patterns of interaction overlap and are interdependent of each other (Krackhardt, 1990; Kadushin and Brimm, 1990). Larson (1992) states that while formal agreements provide a frame of reference in which the alliance operates, informal interfaces are the glue that holds the alliance together, and that both mechanisms coexist in networks. More broadly, some authors propose that as sources of complexity add up in a relation, a larger and more mixed set of coordination mechanisms is set in place (Grandori and Soda, 2006).

Governance of the network as a whole

An important aspect of network governance is the influence played by the different actors in defining its governance mechanisms. Taking the network as a unit, Provan et al. (2007) distinguish between shared governance, lead organization governed, and independent network administrative organization, proposing that the extent to which lead-organization or hub-firm governance occurs is dependent on that organization

⁸ In a 'structural hole' different parts of a network are disconnected but bridged by a few nodes that can then act as brokers among the parties (Burt, 1992).

having sufficient resources and legitimacy to play such a lead role (Provan et al., 2007; Jarillo, 1988; Sydow and Windeler, 1998).

Power can also derive from legislative and regulatory conditions (Knoke and Chen, 2008), or from possessing critical resources (Pfeffer and Salancik, 1978) including financing, legitimacy and strategic allies (Pfeffer, 1992). At the network level, actors can be more or less powerful depending on factors such as their centrality (object of many connections), their betweenness (connecting other organizations) or closeness of their ties (Nohria, 1992).

Network Governance dynamics

A common criticism to the literature in the field of governance is its implicit treatment of each transaction as a discrete independent event (Doz and Prahalad, 1991). By taking the transaction as the unit of analysis, it generally ignores the possibility of a social structure and the history of prior interactions between partners that may alter their choice of governance mechanisms (Gulati, 1995a; Gulati, 1998; Ring and Van de Ven, 1992).

Most of the literature is also mainly static in its view of governance mechanisms, implicitly assuming that these choices take place only at the beginning of the relationship and ignoring evolution of these conditions over time (Reuer and Ariño, 2002; Ariño and de la Torre, 1998; Reuer et al., 2002; Das and Teng, 2002). Though comparatively fewer academics have focused on the dynamic and process aspects of networks, the field has benefited from important contributions over the past 20 years. Ring and Van de Ven (1994) observe that an alliance evolves through iterative processes of negotiations, commitments and executions, each of which is assessed by the organizations in terms of efficiency and equity, and that supplemental agreements can be established to deal with misunderstandings or conflicts, whilst informal, psychological contracts are more prevalent as partners become more committed.

Doz's model (Doz, 1996) identifies learning on environment, tasks, process, skills and goals as a mediating variable between the initial conditions and the outcomes of alliances, whilst initial conditions and learning can influence the partners' willingness to improve jointly on initial conditions. Ariño and de la Torre (Ariño and de la Torre, 1998) integrate the above two views in a study about failed ventures and conclude that partners' assessments of equity and efficiency, based on their interactions and on external shocks, result in renegotiation of the contract or in unilateral behaviour.

As to the factors influencing the sense-making and renegotiation that occur in networks, most authors identify trust in the partner's intentions and the venture itself (Inkpen and Currall, 2004; Zajac and Olsen, 1993), relationship quality⁹ (Ariño

⁹ Relationship quality refers to the measure of strength of a relationship. Here I use Ariño and de la Torre's (1998) interpretation of the concept encompassing an initial state of trust and confidence, the

and de la Torre, 1998), and joint vs. differential learning (Doz, 1996; Ring and Van de Ven, 1994; Inkpen and Currall, 2004; Kumar and Nti, 1998) as mediating variables that impact the need or desire to re-negotiate conditions in network relationships.

A common view among authors points to the existence of virtuous or vicious cycles. Relationships can thus enter a 'virtuous cycle' where, as positive trust reinforcement among actors increases, the relationship will tend to depend proportionately more on informal relative to formal governance mechanisms (Ring and Van de Ven, 1994). Heide and John (Heide and John, 1992), for example, argue that in the early stages of a buyer-seller relationship norms may not be fully established and a buyer may rely on contractual protections. As the relationship develops, 'supporting norms may evolve and eventually enable a buyer to establish control' (Heide and John, 1992p. 42). Inkpen and Currall (2004) also argue that 'learning about the joint venture partner increases the likelihood that partner firms will reduce their emphasis on formal joint venture controls' (2004p. 593). On the other hand, lack of cooperative behaviour or insufficient investment on specific assets can lead to decreased trust (Humphries and Wilding, 2004) and increased use of formal mechanisms of coordination which, in turn, can lead to a 'vicious' cycle of increased formal mechanisms and decreasing trust.

Besides internal factors, the relationship can also be impacted by external changes, where environment changes can impact partners' re-evaluation of the alliance (Ariño and de la Torre, 1998) and uncertainty on the state of nature and the clarity of objectives can influence governance decisions over time (Inkpen and Currall, 2004). Table 3-1 summarizes selected authors' approach to factors impacting the evolution of governance mechanisms and the forms that these mechanisms take over time.

firm's cumulative experiences during the execution, and external events that can affect reputation or credibility of partners.

Table 3-1: Factors impacting the evolution of governance mechanisms

Authors	Initial conditions and governance mechanisms	Evolution of conditions and impact on governance mechanisms
Ariño and de la Torre (1998)	Initial expectations of efficiency and equity Initial relational quality (based on previous personal bonds and institutional reputation). Uncertainty about partners, state of nature and venture.	Changes that impact evaluation on equity and efficiency and uncertainty include execution of commitments, learning, conflict resolution, external changes, relationship quality, and learning-action-reaction loops. Conditions can be adjusted to restore efficiency and/or equity but there may also be unilateral reactions or dissolution of the relationship if balance cannot be restored.
Doz (1996)	Initial conditions determine whether and how learning takes place between partners: <ul style="list-style-type: none"> • Task definition • Partners' routines • Interface structure • Expectations of performance, behaviour and motives 	Learning about environment, processes, skills and goals allow re-evaluation of efficiency, equity and adaptability, leading to revised conditions. Successful alliances engage in iterative and interactive learning cycles over time, with greater trust, adaptive flexibility and commitment. Failure may occur if initial conditions block or delay learning or do not foster joint learning
Heide and John (1992)	Safeguarding against opportunistic behaviour and investment of specific assets. Governance mechanisms include contracts and Transaction Specific Investments.	Increased presence of supportive norms provides confidence. Norms may eventually enable a buyer to establish control independent of contracts.
Inkpen and Currall (2004)	Expectations on trustworthiness of partner (competence and benevolence) influence decision on control mechanisms. Clarity of collaborative objectives and guidelines foster initial development of trust. Social controls play a larger role when initial trust is high. Extensive initial use of formal control can slow down development of trust, formal controls that create structure assurance will foster development of trust	Trust, control and learning (partner and venture) co-evolve in the relationship. Social control complements formal control as trust and learning about partner and venture increases. Imbalanced learning leading to shift in bargaining power can lead to increased formal controls.
Ring and Van de Ven (1994)	Expectations about motivations, investments. Uncertainty on future states of nature and behaviour of partners. Bargaining process includes process of sense making. Governance through formal legal contracts and informal psychological contracts.	Execution of commitments through role interactions and personal interactions. Continuous sense making and formal bargaining. Supplemental agreements are established to deal with misunderstandings, conflicts and changing expectations. High-commitment relationships increasingly governed by informal, psychological contracts.
Gulati (1998)	Network resources from previous alliances and history impact initial forms of governance. Embeddedness of firms and informal, personal connections promote 'knowledge-based' trust, helping to develop trust around norms of equity. Social network can also act as 'deterrence-based' trust. Each partner's awareness that the other has much to lose from behaving opportunistically.	Cautious initial contracting gives way to looser practices as partners become increasingly embedded in a social network. Firms may use network to control benefits proactively by utilizing their advantage position to play one partner off against another. As social network grows, new ties contribute to the differentiation among organizations by their specific direct and indirect relations and by the structure positions that organizations occupy.

Integrative model of evolution and governance dynamics of network relationships

In an effort to integrate existing models in the literature, Figure 3-1 presents a model to study network relationships and the evolution of context, activities and accompanying governance mechanisms.

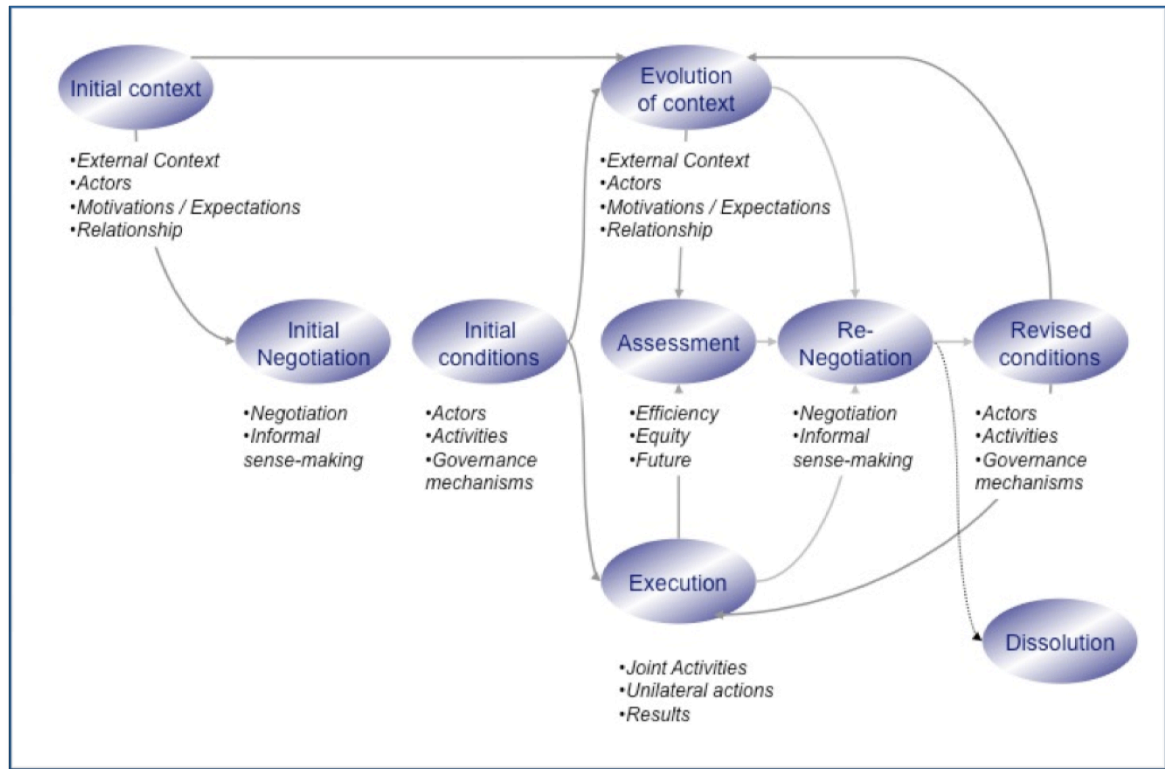
The model is designed as a descriptive framework and was derived from the literature analyzed in a Systematic Literature Review carried out as part of the Doctoral Research (please refer to Chapter 2, Section 2.8.4 for a review of the development of the model).

The framework integrates concepts from models proposed in the literature that address the creation phase as well as the evolution of a network. In line with Smith Ring and Van de Ven's model of cooperative inter-organizational relationships, the framework includes 'a repetitive sequence of negotiation, commitment and execution stages, each of which is assessed in terms of efficiency and equity' (Ring and Van de Ven, 1994, p.97). It also incorporates a set of initial conditions, as per Doz's (1996) model of alliance evolution and in line with Lambert et al.'s (1996b) partnering components and Håkansson and Snehota's (1995) actors, activities and resources model.

The framework also incorporates a context element. Ariño and de la Torre (1998) identify external change as a factor influencing the evolution of networks. In addition to this, the framework includes a broader concept of context to include Granovetter's notion of embeddedness (Granovetter, 1985) and Gulati's (1995a) incorporation of relationship history. Lastly, consistently with the purpose of the questions in this research, the model also explicitly incorporates governance mechanisms as a variable within network conditions. The definitions for each of the variables included in the framework are included in Appendix 6.1.

Initial context conditions, both external and actor-related, influence the initial negotiation phase and this negotiation in turn leads to a first set of initial conditions that specify the actors involved, the activities or tasks to be performed and the governance mechanisms to regulate the relationship. Evolution in the external and internal contexts and the outcomes of execution of activities lead to re-assessment of the current status of the relationship and expectations on its future evolution. This in turn leads to a new phase of re-negotiation and either continuation, revision or dissolution of the relationship.

Figure 3-1: Model of evolution of network relationships



3.3.1 Identifying a gap: Uncertainty and governance dynamics

Using the descriptive model developed on the basis of the literature review and which is reproduced above, this study identified three areas that merit further research: 1) pursuing empirical research in relationship dynamics; 2) exploring the role of uncertainty in the definition of governance mechanisms; and 3) studying the evolution of governance mechanisms over time.

The field of network dynamics, though still limited in volume relative to the static analysis of relationships, has benefited from important contributions over the past fifteen years. The theoretical models that were presented in the previous section have advanced the understanding of how relationships evolve over time, the importance of initial conditions, the role of external context and pre-existing relationships, and have highlighted the role of learning and relationship quality as factors influencing network development.

However, although a number of researchers have made theoretical contributions, limited empirical research has been carried out in this field (Salk, 2005; Reuer and Ariño, 2002). A first gap that this research addresses is applying these conceptual models in an empirical study of a multi-stakeholder network, contributing to academic and practitioner understanding in this field.

A second gap identified in the literature and addressed in this research relates to the

role of context uncertainty, its influence on the definition of initial governance mechanisms and the subsequent evolution of these mechanisms. The review of the literature suggests it is an area where there is limited consensus and where an increased use of formal mechanisms (Williamson, 1991; Williamson, 1985), at least in the case of environmental uncertainty, has not been supported by the findings of empirical research (David and Han, 2004; Coles and Hesterly, 1998, cited by Koenig and Mellewigt 2006).

A third gap identified and addressed refers to the evolution of the mix of governance mechanisms over time. There appears to be a common view that the introduction of formal mechanisms acts as an element that seeks to fix a relationship, re-establish balance (Ariño and de la Torre, 1998) or deal with misunderstandings or conflicts (Ring and Van de Ven, 1994). The only differing point of view is that offered by Viaar et al. (2006) that presents a conceptual development of formalization as an opportunity to provide clarification (Viaar et al., 2006). As this implies a very different use of governance mechanisms, the topic merits further research and exploration through empirical research.

The research questions thus addressed in this empirical research are:

- How does a context of high uncertainty influence the definition of governance mechanisms in a network?
- How and why do network governance mechanisms evolve over time?

The objective of the research was thus to facilitate understanding of the issues behind initial governance mechanisms and their evolution in a context of uncertainty. It was also designed as a base to contribute to theory building, a research strategy that involves using one or more cases to create theoretical constructs, proposition and/or midrange theory from case-based empirical evidence (Eisenhardt, 1989b).

3.4 Methodology

3.4.1 Research methodology

A qualitative research approach was used to analyze the Nespresso AAA Sustainable Quality Programme, one of the first multi-stakeholders sustainable sourcing networks to be established in the industry. Because the number of such networks already in execution stage is very limited, the case can be considered an 'extreme or unique' case that can validate the use of in-depth single case analysis (Yin, 1994). It also offers an occasion to carry out an in-depth examination of the dynamics of collaboration present in a single and unique setting (Eisenhardt, 1989a; Parkhe, 1993a). Qualitative research has been proposed as an adequate approach to explain causal links in real-life interventions that are too complex for the survey or experimental strategies (Yin, 1994).

The research adopts a longitudinal approach, proposed as appropriate to study and explore subjective meaning systems and social processes and to capture the complexities and dynamics of cooperation (Smith et al., 1995).

Qualitative research and single case studies are not, nevertheless, undertaken without difficulties. Eisenhardt and Graebner identify five challenges that qualitative, theory building cases have to address at the different stages of the process: clearly stating the rationale for the research, presenting theoretical sampling, dealing with interview data, presenting the empirical evidence and writing the emergent theory.

The rationale for undertaking this research has already been addressed in two areas. The introduction to this chapter, Section 3.2, highlights the importance of increasing our understanding of creation and evolution of governance mechanisms in the rapidly expanding phenomena of multi-stakeholder networks. After reviewing the literature on the field, Section 3.3.1 identifies the gaps and limitations in the theory that justify undertaking this research. As these questions have already been addressed, the three remaining issues are addressed below.

Theoretical sampling and Case selection

The Nespresso AAA Sustainable Quality Programme was selected based on three considerations: 1) as sustainable sourcing initiatives in the coffee sector are relatively recent, it provided an opportunity to observe creation and evolution patterns under conditions of context and process uncertainty; 2) as the programme was started about five years before the analysis was conducted, it provided enough opportunities to review evolution of conditions and governance conditions, while at the same time affording the possibility to identify and interview relevant participants thus offering an increased probability that records were kept and memory of key events was fresh enough; 3) access to key decision makers in all intervening organizations was facilitated, thus allowing a relatively rare opportunity in case research to interview all relevant stakeholders, from farmers at location, to partners, to Nespresso's past and present executives.

Theoretical sampling implies that cases are selected because they are suitable for 'illuminating and extending relationships and logic among constructs' (Eisenhardt and Graebner, 2007). Further, single cases are chosen because they are unusually revelatory, extreme exemplars or opportunities for unusual research access (Yin, 1994).

Data sources

The three major sources of evidence used for this research – historic records, documents, and interviews – are explained in detail in Section 3.4.3. These sources are among the six outlined by Yin (1994) as primary sources of evidence in qualitative research.

The interview respondents represented a mix of stakeholders, geographies, functions and tenure. In addition to contributing to the richness and variety of the data, this

approach is also believed to help mitigate potential biases from informants in the unlikely event that varied informants would engage in convergent retrospective sense-making or impression management (Eisenhardt and Graebner, 2007).

In addition, the historic records and documents providing additional data were used to complement the views of participants, offering a view of formal governance mechanisms and records of relationship building events as they were announced at the time they occurred.

Presenting empirical evidence and emerging theory

Eisenhardt and Graebner state that a challenge associated with qualitative research is that case data – as opposed to large-scale deductive studies – cannot generally be tightly summarized because much of it consists of rich qualitative detail. This, according to the authors, can be addressed by presenting a relatively complete rendering of the story within the text and the ‘story then intertwined with the theory to demonstrate the close connection between empirical evidence and emergent theory’ (Eisenhardt and Graebner, 2007, p.29).

As this is a single-case study, this document follows these recommendations, with Section 3.6 detailing the findings in a story format interspersed with the supporting data, and Section 3.7 contrasting the findings with the existing literature, presenting a series of propositions and an integrative model contributing to theory building.

Detailed methodology

In general, and as noted above, some of the difficulties encountered when presenting single-case qualitative data are to accurately present the rigor with which the research was undertaken and allow for the process to be replicated by an independent observer (Vogt, 1993). Following this cautionary advice, and as suggested by Lofland and Lofland (Lofland and Lofland, 1984), the data collection and analysis procedures were documented and are summarized below, with additional specific information on the interview protocols in Appendix 6.6 and on the coding process in Appendix 6.8.

3.4.2 Unit of analysis

In this research, the main unit of analysis was Nespresso’s AAA Sustainable Quality Programme network as a whole, including all organizations that directly participated in the network. The dyadic relationship between actors was analyzed as part of the network but the focus of the research was on studying the governance mechanisms of the network as a whole.

As Provan and Fish propose, ‘only by examining the whole network can we understand such issues as how networks evolve, how they are governed, and, ultimately, how collective outcomes might be generated’ (Provan et al., 2007, p. 480).

3.4.3 Data Collection

The sources of data included 15 pieces of documentation or archival records, 48 interviews with stakeholders in all the organizations involved in Nespresso's AAA Sustainability Network and a series of visits to farms and cooperatives participating in the programme.

Interview respondents

The interview list was composed in several phases. After identifying the relevant stakeholder organizations involved, the principal criterion for determining the respondents within these organizations was their experience or knowledge of the programme at any time between 2003 and 2007, even if they were no longer part of the organization. An initial list of respondents was drawn up with a consultant that had been involved in the programme since its inception. Snowball sampling was used to identify and gain access to the most suitable respondents within each organization.

A total of 48 semi-structured interviews were then carried out with Nespresso executives and representatives of stakeholder organizations directly involved in the programme at any point during the period studied. The respondent set included Nespresso's CEO and both Programme Managers that were active during the period 2003-07. It also included central, regional and local representatives of five suppliers, two NGOs, two consulting companies and one multi-lateral development organization.

In addition, six farms in Costa Rica and Colombia were visited, and eight farmers and six cooperative managers were interviewed for the project. The farms visited were proposed by the suppliers and therefore may or may not be representative of the rest of the farms involved in the project. Still, it provided a view on how the AAA Sustainability Programme was executed in the field and some of the challenges and opportunities faced by farmers participating in the programme. To complement this data, twenty additional farmers selected by the researcher to represent a range of farms filled in a short questionnaire. Respondents were assured that information disclosed during the interview would be treated as confidential, thus enabling potentially critical viewpoints about the programme, relationships or other actors to be expressed.

Semi-structured interviews were conducted between June and September 2007. Each meeting lasted approximately 60 minutes, with a handful extending for up to three hours. Of the total number of interviews, 41 were face-to-face meetings in Switzerland, Costa Rica and Colombia, while 7 were done via the telephone. After the first round of interviews, 5 participants were questioned a second time to expand on topics or to clarify their responses.

As areas.

Table 3-2 illustrates, the interviews covered multiple organization and geographic areas.

Table 3-2: Semi-structured interviews by organization and geography

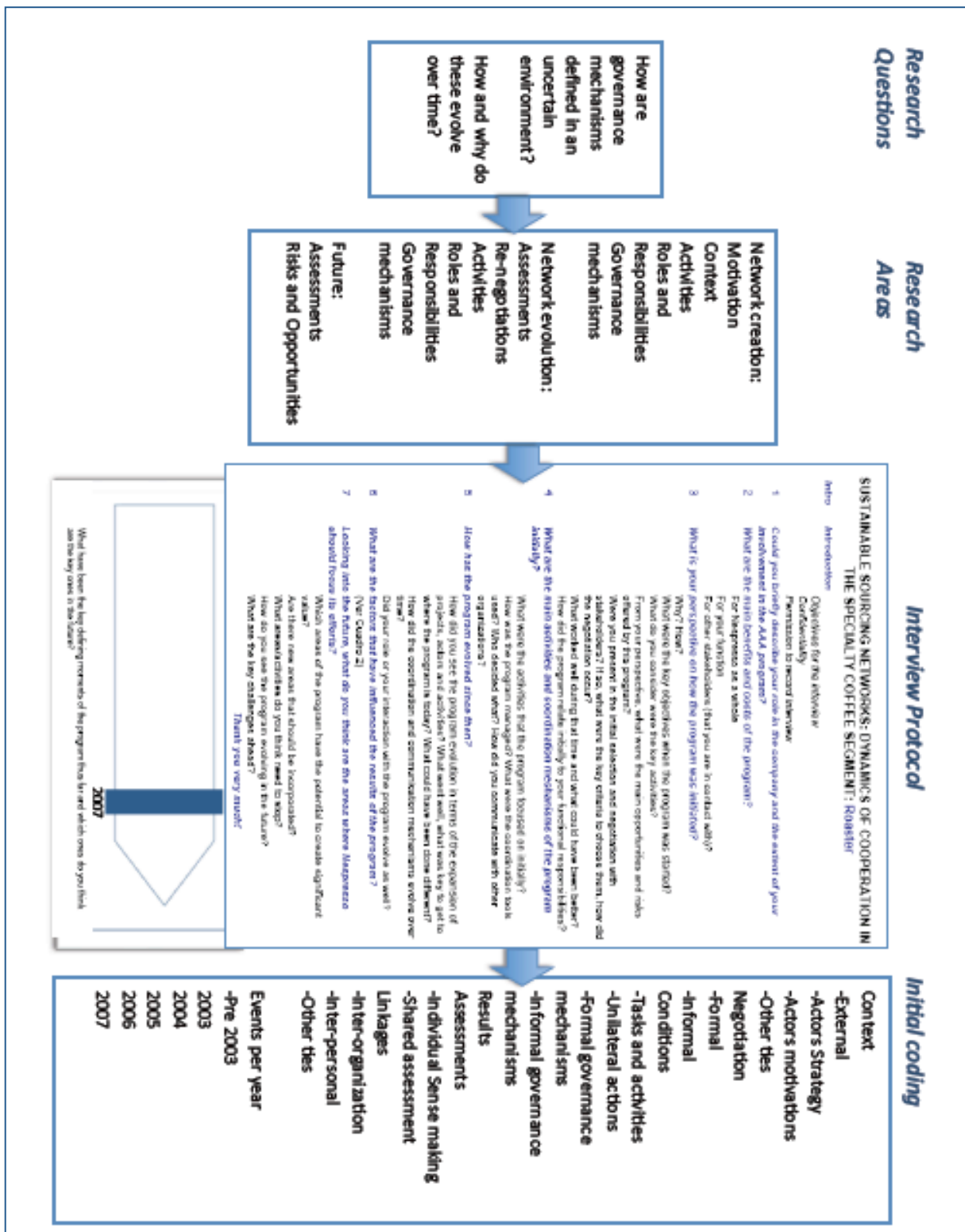
	Central level	Regional/ National	Local/ Farm	Total
Nespresso	8	2		10
Coffee traders	6	6	4	16
Coffee Cooperatives		1	5	6
Farmers			8	8
Consultants	1			1
Non-Government Organizations	2	3		5
Multilateral organizations	1			1
Other		1		1
Total	18	13	17	48

Interview protocol

Based on the research questions and the gaps identified in the literature, a set of initial constructs was defined. These constructs were then used to prepare an interview protocol to be used in the semi-structured interviews. Figure 3-2 illustrates the process followed. The two research questions on the creation and evolution of governance mechanisms were framed in three areas of questioning: Network creation, network evolution and future perspectives. Besides the governance mechanisms, the research also analyzed the broader context of the relationship, including antecedents to network creation such as context conditions and motivations, activities and roles of the organizations involved. The network evolution component also enquired about individual and shared assessment as the relationship evolved.

These research areas were then translated into an interview protocol (Appendix 6.7.1) that was used as a basis for semi-structured interview questions to all the organizations participating in the programme, except the farmers, a group of which responded a separate questionnaire. The interview protocol consisted of a series of open-ended questions in seven areas and a blank time-line chart where respondents freely positioned the context or the programme-specific events that they considered had impacted the programme thus far and the expected key events impacting the programme in the future.

Figure 3-2: Research questions and interview protocol



A full copy of the interview guideline, timeline form and enhancers/inhibitors chart are included in Appendix 6.6. The research questions and interview protocol were also used as a basis for the initial coding utilized and are detailed later in the section documenting the data analysis process.

Documents and archival records

An additional research data source consisted of relationship documents and archival information in the form of contracts, agreements, reports and press releases. In total, 15 documents were analyzed. Table 3-3 lists the titles and type of documents included in the research. These documents were also analyzed using the research questions and the data coding presented in the next section.

Table 3-3: Documents reviewed

Document name	Type of document	Year
Agreement with supplier	Agreement/Contract	2003
Anonymous AAA commitment	Agreement/Contract	2007
Nespresso RA Activities 1	Agreement/Contract	2005
Nespresso RA MOU	Agreement/Contract	2003
Public-private partnership Costa Rica	News release	2006
Ixthuaplan project	News release	2005
Costa Rica project	News release	2006
News release Miles	News release	2006
Commitments 2010	News release	2006
Awards and Africa	News release	2007
Project report Caldas	News release	2005
Project report San Ramon	News release	2005
TASQ-Fact sheet	News release	2006
Stakeholder Forum Report 1	Report	2005
Stakeholder Forum Report 2	Report	2007

3.4.4 Data Analysis

The documents reviewed were all accessible in print or in electronic format and in the English language. The interviews were originally done in Spanish, English and Portuguese. All interviews were taped and transcribed in their original language. The data were then analyzed using data reduction techniques to identify emerging themes and concepts, guided by the research questions.

As Miles and Huberman (1994) suggest, the research questions were used to create a first list of descriptive codes. The initial coding, which can be viewed in Appendix 6.8.1 was used to analyze an initial set of transcripts and documents.

The software tool NVivo Version 8 (QSR International Pty Ltd, 2008) was used for this process. The software has built-in tools for uploading documents, classifying, sorting and arranging information using, among other functionalities, tree nodes and sub-nodes.

Two researchers (one of whom had not been involved in the interview phase) independently coded three representative interviews and two documents. This process sought to identify discrepancies in interpretation of the categories and to limit the extent of subjectivity that may exist in interpreting semi-structured interview data, as suggested by Johnsen et al. (2000). Discrepancies and unclear areas were identified using such process. Appendix 6.8.1 reproduces the differences in coding results of two of the three interviews. After a discussion on the discrepancies or areas that could lead to confusion, a final set of coding variables was agreed upon and is reproduced in Table 3-4 and Table 3-5.

Table 3-4: Coding variables - Category

Category	Code		Definition
Context	External macro context	ExContx	Macro-economic, political and industry conditions surrounding the programme. It includes industry-wide events as well as consumer, media, NGO activities and government actions.
	Actors Overall Strategy	AcStrat	Actions or statements relating to broad strategic choices made by an organization, ex. new markets, products, aspirations, leadership changes.
	Actors motivations/ expectations	AcMotiv	Rationale to seek the establishment or expansion of relationship among two or more actors.
Negotiation	Informal	NegoInf	Attraction, communication and informal bargaining among actors.
	Formal negotiation	NegoFor	Establishment of formal contracts or other forms of contractual agreements.
	Power	Power	Power balance, demonstration of power among the parties.
Conditions	Programme Tasks and activities	Activ	Activities related to the operation of the programme including information sharing, knowledge capture, infrastructure, education, etc.
	Roles and Responsibilities	RResp	Individuals and organizations involved in the programme, their roles and responsibilities within it.
	Unilateral actions	UniAct	Actions decided unilaterally by one of the actors in the relationship that may have an effect on other actors.

Category	Code		Definition
	Coordination mechanisms	Coord	Formal and informal coordination mechanisms (planning, budgeting and reporting activities, informal communication, encounters, e-mails, face to face informal interaction, events, etc.)
	Resources	Resources	Allocation of financial and human resources to activities related to the AAA Programme.
Results	Results	Results	Key Performance Indicators (general or per actor). Results against these indicators or general results.
Assessment	Sense-making by individual actors Strengths/Weaknesses	AssessIndiv	Reflections made by individuals or by organizations with regard to the equity or efficiency of the programme.
	Shared assessment	AssessGrp	Shared assessments of areas of challenges and opportunities for the AAA Programme.
Linkages	Inter-organizational linkages (in programme)	Link-Org	Creation, strengthening, weakening and/or dissolution of ties among organizations in the AAA Programme as part of the AAA Programme.
	Interpersonal linkages	Link-Pers	Creation, strengthening, weakening and/or dissolution of ties among individuals in the organizations involved in the AAA Programme.
	Other ties between organizations	Link-Ext	Creation, strengthening, weakening and/or dissolution of ties between organizations in the AAA Programme with organizations that are not part of the AAA Programme or non-AAA relationships with organizations that are part of the programme.

Table 3-5: Coding variables - Chronological

Category	Code		Definition
Before 2002, 2003, 2004, 2005, 2006, 2007	External events	Y02-Ext Y03-Ext Y04-Ext Y05-Ext Y06-Ext Y07-Ext	Macro events impacting at industry, country level.
Before 2002, 2003, 2004, 2005, 2006, 2007	Relationship events	Y02-Rel Y03-Rel Y04-Rel Y05-Rel Y06-Rel Y07-Rel	Dyadic or multi-actor events occurring at the level of the AAA Sustainability relationship.
Before 2002, 2003, 2004, 2005, 2006, 2007	Organization and individual events	Y02-Org Y03-Org Y04-Org Y05-Org Y06-Org Y07-Org	Events occurring within one of the organizations or relating specifically to an individual within that organization.

The interviews and documents were then coded by one of the two coders, as detailed in Appendix 6.8.2 with one of the researchers coding 26 interviews and 13 documents and the other coding the remaining 19 interviews.

Each interview and document was thus electronically coded using the software program NVivo. Figure 3-3 indicates the number of nodes and the total number of references from each interview transcript and document. Each transcript or document was also assigned a code to serve as a reference in the summary analysis and in this document.

Figure 3-3: Coding by source - Interviews and documents

Central

Name	Nodes	References
CE-CN-1-DS	15	59
CE-EX-1-JO	18	37
CE-EX-2-JCA	25	108
CE-EX-3-AM	8	13
CE-EX-4-NR	23	61
CE-EX-5-MF	14	36
CE-EX-6-JT	13	29
CE-EX-7-MF	21	47
CE-ML-1-JGF	13	28
CE-NG-1-CW	13	23
CE-NG-2-RS	13	28
CE-NG-2-RS (2)	1	2
CE-NN-1-AR	24	96
CE-NN-2-GB	12	26
CE-NN-3-HJR	11	31
CE-NN-4-JM	4	4
CE-NN-5-KR	23	49
CE-NN-6-OG	21	65
CE-NN-7-PB	17	38
CE-NN-8-OQ	9	17

Costa Rica

Name	Nodes	References
LO-EX-11-CA	20	87
LO-EX-12-MO	11	23
LO-EX-13-TS	8	17
LO-EX-14-TJ2-JD3	3	11
LO-EX-15-EC	7	24
LO-FA-11-CO	3	3
LO-FA-12-DRO	8	11
LO-FA-13-Prod La Giorgia	4	7
LO-NN-11-DF	7	17
LO-NN-12-JD1	10	37
LO-NN-13-JD2	3	3
LO-NN-14-JD4	2	2

Colombia

Name	Nodes	References
LO-CN-21-ES	18	39
LO-CO-21-FE	5	10
LO-CO-22-ADH	5	5
LO-CO-23-Coop-S -Prod Sup	6	10
LO-CO-EX-23-CS	10	16
LO-EX-21-MR	16	42
LO-EX-22-CAG	16	50
LO-EX-24-CB	7	13
LO-EX-25-DG	3	8
LO-EX-26-Extension-Quality	3	5
LO-EX-27-LM	15	30
LO-FA-21-Prod Cauca	4	5
LO-FA-22-Prod-Supia-1	7	12
LO-NG-21- L B (2)	17	37
LO-NN-21-SA	24	67

Brazil

Name	Nodes	References
LO-EX-31-C J	4	7
LO-NG-31-ET	8	9

Documents

Name	Nodes	References
JA-1-Agreement with Brazil suppli	3	5
JA-2-Anonymous AAA commitme	8	66
JA-3-Nespresso RA activities 1pg	4	7
JA-4-Nespresso RA MOU Version	4	5
NR-1-Achievements news	3	4
NR-2-Ixthuaplan project	0	0
NR-3-News_Release_2006_Cost	4	4
NR-4-News_Release_2006_Miles	3	3
NR-5-News_Release_2010_Com	3	4
NR-6-News_Release_Awards_Afr	1	1
NR-7-Project_Report_Caldas	2	3
NR-8-Project_Report_San_Ramo	3	3
NR-9-TASQ_Factsheet	1	1
SR-1-Stakeholder_Forum_Report	3	4
SR-2-2007 Stakeholder Nespress	18	42

The coding was organized in a tree-node structure with parent and child nodes. Some tree nodes had few references associated with it. For example, there was only one

reference to the child node ‘relationship inhibitor’ as most of the references on assessments were general in nature and therefore were coded in the parent tree-node ‘Organization and individual sense-making’, which had 32 sources associated and 111 references coded. Figure 3-4 displays the parent-child tree node structure. The diagrams also indicate the sources coded in each category and the number of references identified in each node. Additionally, an example of the most referenced sources included in the Coordination Mechanisms node are displayed in Appendix 6.8.4.

Figure 3-4: Tree-node coding - References coded

Name	Sources	References
Assessments	5	5
Organization and Individual sense-making	32	111
Enhancers	3	4
Inhibitors	1	1
Opportunities and Strengths	24	49
Risks and Weaknesses	22	56
Shared assessment	13	24
Conditions	0	0
Coordination mechanisms	21	69
Formal governance mechanisms	13	45
Informal coordination mechanisms	12	26
Program tasks and activities	49	270
Resources	24	51
Roles and Responsibilities	31	111
Unilateral actions	3	3
Context	0	0
Actors motivations and expectations	38	103
Actors Overall Strategy	25	62
External macro context	13	26
Linkages	6	10
Inter-organizational linkages (in program)	27	96
Inter-personal linkages	13	25
Intra-organization relations	3	4
Other ties between organizations	23	61
Pre-existing organization linkages	1	1
Negotiation	18	40
Formal Contracts & Agreements	14	23
Informal negotiation	8	11
Power	5	10
Results	25	49

Data synthesis and pattern analysis

At the end of this phase the entire database was again reviewed to identify any overlaps and to ensure relevance of the references to the topic. It was then analyzed looking for patterns and indications to help build explanations for the unique situation and experiences (Yin, 1994). A matrix combining the chronological

dimension and the themes emerging from the research was built using an excel spreadsheet, transferring the data from the NVivo database, translating when necessary any Spanish or Portuguese quotes into English and disguising the names of organizations and individuals to preserve privacy and confidentiality. An extract of this spreadsheet is replicated in Table 3-6. A print-out of the section on Governance Mechanisms is included in Appendix 6.8.5. The complete workbook including eight spreadsheets is available on request in print or electronic format.

Table 3-6: Emerging themes - Sample extract from spreadsheet

				Sheets	Charts	SmartArt Graphics	WordArt				
	A	B	C	D	R	S	T	U	V	W	
1	Governance Mechanisms										
2											
3											
4	Variable / Year	State	Evidence	2006	State	Evidence	Reference	2007	State	Evidence	Reference
5											
6	Coordination mechanisms	1. Disorganized communication	1. "When I joined the program (2004-07), I saw there were a lot of deficiencies in terms of clarity. There was nothing written, nothing was very organized and information was just passing from one person to another with vague indications of what really needed to be done."					1. NN-RFA reviews, communication		1. "...besides Chris there is also our executive director Terrie Whelan, who's involved in Nespresso, of course, and from Nespresso there are different people like there's Karsten, and then there's Dean Sanders and there's Paulo, so maybe the recommendation would be that once a year we try to come together and talk more in detail about where to take this program, let's say within two to three years, what are your goals for within two to three years and not just talking about numbers because Nespresso is very good in defining KPIs ... so not just putting the numbers but looking a little bit closer, to get to these numbers what needs to be done, by whom and when, and which countries ..."	1.CE-NG-2
7		1b. Organized communication	1b. "My perception is that the communication and channel, and also contents, are already rather clear to those involved now on our side. And on the side of NN there is still some parallel communication on issues which have to be more streamlined... but this is not causing any problems, it's just that efficiency, I would say, can still be raised on this side as well as on NN side."					2. Intra-organization coordination-NN		2. "I think it would now be a good time to sit down, the whole team, for a few days and coordinate everything. It is quite difficult to manage all this by phone. Karsten has some ideas, Alberto also needs to match his purchasing KPIs, Alexis has the quality part, Paulo, Juan Diego and myself are more aligned. But it would be good to first sit down ourselves and then also with Rainforest Alliance, the major partner in all of this."	2.LO-NN-21
8			1c. "The role of people like R.K. and myself are very important as program coordinators at a global level. We are responsible to guarantee the communication flow is efficient but that the quality of communication is not lost or that it becomes overly technical. This has worked well so far and I think that if we maintain this principle it can continue working as the program grows."					3. Complexity		3. "Coordination now is more difficult. Because there are more actors. There are also more interests and power relationships. An actor can now say "I get more PPP funding, listen to me"	3.CE-NN-1
9			1d. "I think we found a good way of communicating. Of course we have the time difference with Switzerland, but, as I said, we work quite a lot as well with R. in Costa Rica. We are in the same time zone. But also with Paulo in Switzerland we found a good way to communicate that whenever we need to talk we find a time to do so..."					4. Manual?		4. "We still don't have an implementation manual for this thing. Ask Starbucks, they have one, everything is spelled out there. Even internal people sometimes complain they don't have a manual!"	
10			1e. "One thing that has changed lately is that now the communications are one-on-one. I talk with R. with A. with H. with R. but always one-on-one and not the whole group as it used to be. When a topic was discussed we could all chip in, while now you depend on them communicating among themselves. And people don't communicate the same way when you speak with them or when they are speaking to their boss..."							4b. Structure, process and cooperation rules, it is still not clear. There's been a lot of work on this, but it is still not clear."	4b.CE-NN-1
11			1f. "If I'm talking to Supplier A and if I want to do several projects with a company in 3,4,56 countries I can't do one one conversation with each managing director... so we asked for some structure in place where we have someone overseeing the project from Ecom's perspective."								
12			1f. "The hiring of A. as a member of the team was crucial. It helped solved a lot of bottlenecks and it gave an opportunity to our quality and technical people to talk directly with someone there, in their language, in their time-zone."					5. IT Systems		5. "Everything is still handled in little word or excel spreadsheets, there is no SAP or anything like that yet!"	5.CE-EX-2
13			1g. "RA is a network of organizations... so they have local organizations... we convinced them that they should establish sort of key account managers, which is totally unique, they don't have that... so we now have a person, based in Guatemala, looking at all these different projects. So we brought her here for a week to explain, to show her everything. So we also moved RA more into an understanding of how an enterprise works and how it could see a cooperation with this INGO. Very senior people at the INGO know this, but people that have been working on the field... I think it was good to enhance a little more of understanding."							5b. "And you know what? Documents have to be really simple to work. Complicated documents are useless. If you see Nespresso documents they are all really simple, most of them in excel. Because every computer has excel. So the TASQ worms and everything is in excel."	5b.LO-NN-12
			2. Change					5. Local		5. "I think the arrival of the local manager in Colombia helped a lot in	5. CE-EX-2

3.5 Research Setting:

3.5.1 Nestlé Nespresso

Nestlé Nespresso is an operating unit of Nestlé Group, one of the world's leading food, beverage, nutrition and wellness companies. The business is headquartered in Paudex, Switzerland, and focuses on premium single-portion coffee at the high-end of the market with a patented coffee-capsule technology, associated machinery and coffee capsules. The business is based on sales of specialized machines through retailers and direct sales of the patented coffee capsules to consumers, each capsule retailing at about CHF 0.50¹⁰. Though the original concept was developed in the mid 80s it was not until the late 90s that the business started showing signs of market success. Despite a slow start, after a rapid transformation, by 2003 sales represented CHF 445 million, up from CHF 127 million five years earlier. The growth rate

¹⁰ At the exchange rate of December 14, 2009, 1 CHF was equivalent to € 0.66 and GBP 0.60

continued over the following five years and by 2007 the company had already reached CHF 1.7 billion in sales.

3.5.2 The Coffee industry

The coffee industry with retail sales of 45 billion US dollars (Euromonitor Global Market Information Database, 2008) is also one of the most widely traded agricultural commodities in the world. Most of its consumption concentrates in developed economies while production takes place in smallholder farms in more than 50 developing nations, with over 20 million families depending on this crop (Ponte, 2004). From 1962 to 1989 the industry was tightly regulated by a trade, quota-based International Coffee Agreement (ICA) subscribed by most producing and consuming countries that regulated the target price for 'green' coffee (beans that have been washed and dried but not yet roasted and have a green colour).

The ICA broke down in 1989 (Ponte, 2004; Muradian and Pelupessy, 2005) and shortly after an oversupply of coffee and the entry of low-cost new actors such as Vietnam led to prices falling to an all time low in the second half of 2001 (International Coffee Organization, 2007). For more information about the characteristics and recent history of the coffee industry see Ponte (2004), Muradian and Pelupessy (2005), and Giovannucci and Ponte (2005/6). This coffee crisis hit coffee producers, many of them subsistence farmers, especially hard and it was a call for action for activist organizations such as Oxfam and Equal Exchange which organized campaigns to sensitize consumers and the media on the precarious conditions of coffee growers, questioning the sourcing practices of the large and powerful coffee buyers (Argenti, 2004; Oxfam America, 2002).

At the same time, while demand for average coffee was slowing down, consumer appetite for high quality coffees was on the rise and Nespresso's coffee capsules enjoyed great success, pressuring the supply chain operations to manage a continually rising demand for high quality green coffee.

3.5.3 Nespresso's AAA Sustainable Quality™ Programme

Sensitive to the difficult context conditions and concerned about the long-term supply of high quality coffee needed to support an aggressive growth strategy, Nespresso launched the 'Nespresso AAA Sustainable Quality™ Programme' in 2003. According to the firm, the programme represented an 'effort to secure the highest quality coffee while promoting environmental, social and economic sustainability along the entire value chain, from the farmer to the consumer' (Nestlé Nespresso 2008).

The programme was driven by Nespresso but developed together with green coffee suppliers, Nestlé internal resources and Rainforest Alliance (RA), an agricultural production sustainability non-governmental organization. The programme elements included assessing the sustainability practices of farms and designing a 'continuous improvement' process, while at the same time providing a premium price to farmers for their coffee. During its inception and initial activities the programme operated in

two geographic clusters¹¹ and involved two local NGOs (one RA local subsidiary and one NGO associated with RA through the Sustainable Agriculture Network) and two suppliers. The programme expanded over time, and by the end of 2007 it was operating in 10 clusters in 5 different countries, involving 14 organizations and approximately 12,000 farmers.

Table 3-7 presents the organizations involved in Nespresso's AAA Programme during the period 2003-07 and Table 3-8 lists the regional clusters where the programme operated.

Table 3-7: Organizations involved in Nespresso's AAA Programme 2003-07

Organization type	Organization	Description	Year joined
Roaster - Buyer	Nespresso	Subsidiary of Nestlé, roasts and packages coffee in patented system, sells directly to end consumer	2003
	Nestlé	Consumer goods company: food, beverage, nutrition and wellness	2003
Coffee Traders (Buying green coffee in origin country and selling to roasters)	Expocafé	Colombian coffee trader, owned by 36 cooperatives European sales office based in Switzerland	2003
	Ecom	Global coffee trader with operations in 20 countries, headquartered in Switzerland	2003
	National Coffee Federation of Colombia (FNC)	Colombian coffee trader and not for profit institution supporting coffee farmers and farming communities; European Sales office based in Belgium	2005
	Volcafé – ED&F	Global coffee trader with operations in 21 countries, headquartered in Switzerland	2006
	Neumann	Global coffee trader with operations in 28 countries, headquartered in Germany	2007
	Cooxupé	Brazilian coffee cooperative – Largest private coffee cooperative in the world.	2004
	Efico	Responsible for European sales of Cooxupé, based in Belgium	2004
Non-Governmental Organizations (NGOs)	Rainforest Alliance	Pursues biodiversity conservation and sustainable livelihoods Has its own certification label but also works with company-specific sustainability programmes Acts as Secretariat of Sustainable Agriculture Network	2003
	Sustainable Agriculture Network	Local based biodiversity conservation NGOs in nine countries. Rainforest Alliance – Costa Rica Fundación Interamericana Investigación Tropical – Guatemala FundaNatura – Colombia Imaflora – Brazil	2003 2003 2004 2004 2005
	Technoserve	Helps entrepreneurs in poor rural areas of the developing world to create economic growth.	2006
Consultant	GoodBrand	Provides support to corporations in developing corporate social strategy	2003
Multi-lateral development organization	International Finance Corporation	Member of the World Bank Group, providing investment and advisory services to build the private sector in developing countries.	2007

¹¹ Clusters are geographic regions where the conditions for Nespresso's required coffee quality exist. These clusters are identified and developed in partnership with a coffee supplier, who is granted exclusivity over the region for Nespresso purchases of green coffee.

Table 3-8: Clusters participating in Nespresso's AAA Programme

Country	Trade Partner	Cluster	Year joined
Costa Rica	Ecom	La Giorgia	2003
		Orosi	2006
	Volcafé	Santo Domingo	2006
Colombia	Expocafé	Caldas	2004
	FNC Colombia	Nariño	2005
	FNC Colombia	Cauca	2005
	Neumann	Huila	2007
Guatemala	Ecom	Huehuetenango	2004
Mexico	Ecom	Ixhuatlán	2004
Brazil	Cooxupé	Cerrado	2004

From a chronological perspective, Figure 3-5 through Figure 3-7 illustrate the evolution of the network, both from an actor perspective and also from a geographical one by distinguishing relationships established at the central, regional/national and local levels.

Figure 3-5: Nespresso's AAA Programme – Sustainability Network 2003-04

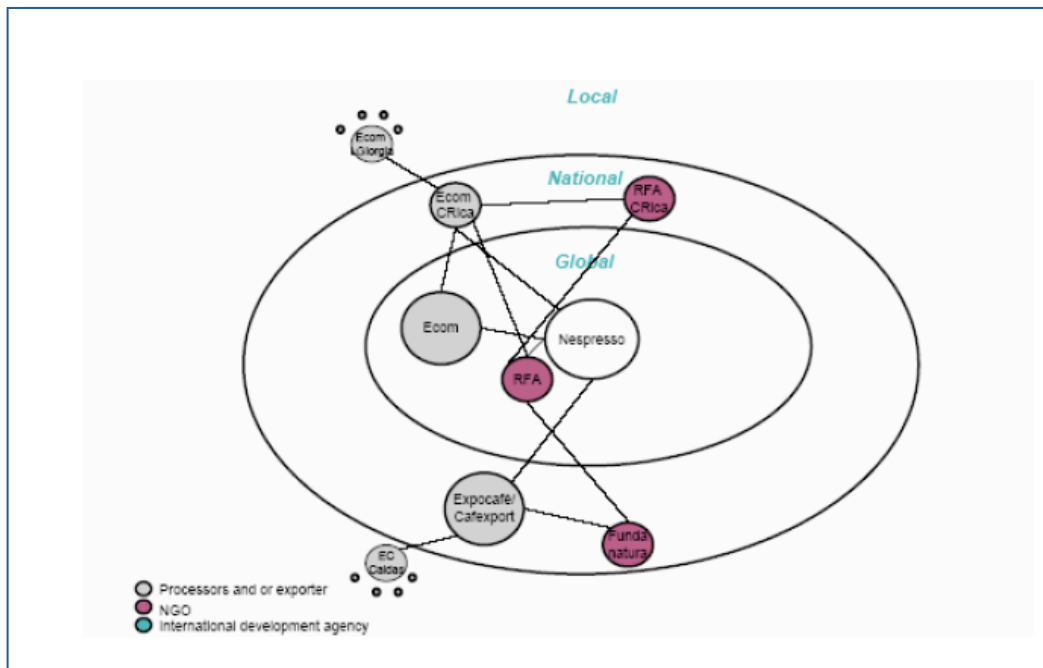


Figure 3-6: Nespresso's AAA Programme – Sustainability Network 2005

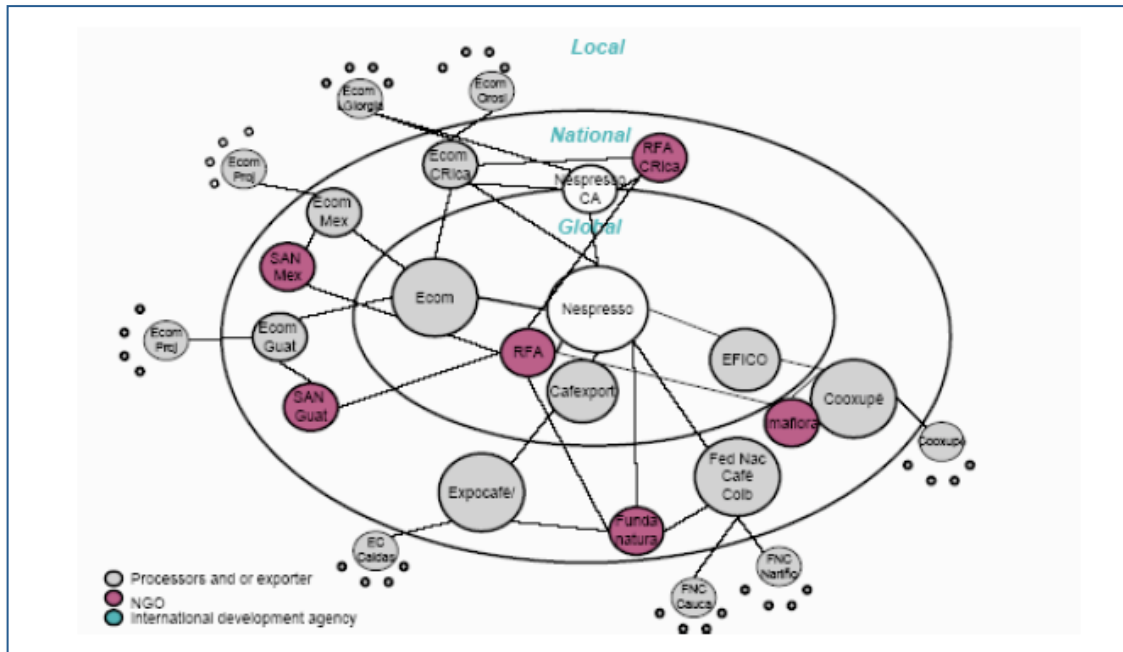
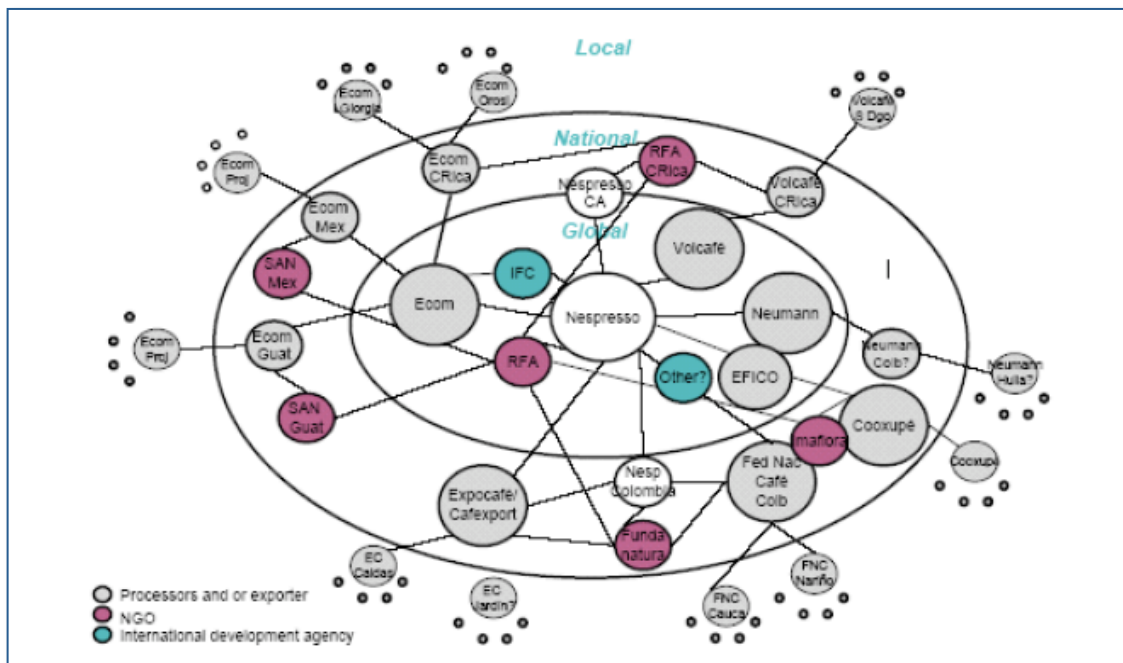


Figure 3-7: Nespresso's AAA Programme – Sustainability Network end of 2007



3.6 Research findings

Using the model developed in Section 3.3 and the results of the coding, the data were reviewed to analyze the co-evolution of external and internal context variables and the relationship conditions and governance mechanisms that were used in Nespresso's AAA Programme.

The findings can be grouped in two distinct phases. The first one took place between 2002 and early 2005 and was marked by high environmental uncertainty, vision and experimentation. A second phase, from 2005 to 2007, was characterized by a lower level of environmental uncertainty and emphasized structured processes, formal coordination mechanisms and the introduction of formal governance mechanisms to complement the informal ones.

3.6.1 Initial context

The external context in the early 2000s was dominated by the repercussions of the coffee crisis in the industry. A number of private initiatives emphasizing socio-economic sustainability standards (e.g. Fair Trade, Utz Kapeh) and environmental sustainability standards (e.g. Organic, Rainforest Alliance) emerged in the coffee sector as 'alternatives outside the public domain for governing the coffee chain and alleviating the coffee crisis' (Muradian and Pelupessy, 2005, p. 2030)¹². However, the majority of the coffee was still being sold in the mainstream (non-differentiated) market, with the sustainable coffees estimated to represent no more than 3% of the total market in 2003 (Daviron and Ponte, 2005). Thus, the external environment was characterized by high uncertainty on the viability of sustainable supply chains for larger industry actors and the multiple alternative programmes and options for companies deciding to engage in this area.

Internally at Nespresso three factors were identified as influencing the creation of the AAA Programme: 1) a clear business need existed to secure the highest quality coffee in increasing quantities over the long term; 2) Nespresso had recently separated its purchasing function from Nestlé's overall green coffee buying, providing the opportunity to manage relationships with suppliers and producers directly; 3) a number of individuals, both at the top and in management levels, were enthusiastic about this topic and about the opportunities it offered.

As the coffee crisis deepened, there were questions about the economic viability of coffee growing in some of the regions from where Nespresso sourced. Securing access to these raw materials to support its high growth objectives was therefore critical. As expressed by a manager:

Of the 10% that is considered high-quality coffee, only about 10% complies with the flavour and quality profile that we need in our coffee. Securing long-term availability of this precious raw material is very important for us (CE-NN-1).

¹² For a complete review of standards and codes of conduct in the coffee industry see Ponte (2004) and Giovannucci and Ponte (2005/6).

Nespresso was also now responsible for its own supply chain, which had been separated from the rest of Nestlé's coffee purchasing operations in 2002 (CE-NN-6). This gave the unit more control to seek the high quality green coffee inputs it needed, but it also entailed managing its own relationships with suppliers and producers to ensure long-term availability of this raw material.

In addition, a small group of individuals was also very influential in the creation of the programme. The CEO was personally engaged in the initiative and saw it as an important opportunity. As it was perceived by the supply chain managers at the time:

The CEO was well known for his clear vision. And he saw this as an area that could be beneficial in multiple dimensions. His message was clear: top quality and get closer to the coffee producer. Once the CEO got engaged, he provided a vision for this project and then the project really took off internally (CE-NN-6).

In his own words:

For me it was very clear. If the coffee farmer has no interest in coffee, sooner or later we will not have any coffee. Also, if we are interested in having the best coffee, we needed to include the sustainability dimension (CE-NN-2).

Another individual, a consultant specialized in Corporate Social Responsibility and previous colleague of the CEO's at another company, was engaged to support the organization in addressing this issue and was influential in generating a vision for the programme. As seen by one of the managers:

He is an energetic and visionary person. He brought in a fresh perspective into Nespresso. He also had the ear of the CEO, and that was very important (CE-NN-7).

In addition, two influential managers in the supply chain, the green coffee manager and the quality manager, had a strong personal connection to the topic and were motivated by the challenges of developing a new concept in the coffee world:

For me, there was also a personal motivation. I come from a coffee growing country and this is an opportunity to give something back to the coffee grower community (CE-NN-1).

It was exciting to be working on this, creating a model that would include the quality criteria alongside the sustainability criteria. Something that didn't exist at the time... (CE-NN-7).

Beyond Nespresso, the internal context for other actors at the time also had an influence on the creation and shaping of the programme. Rainforest Alliance had been working with Chiquita Corporation; a banana growing company, since 1992 and the experience was considered by both parties a success in NGO-corporation collaboration (Rainforest Alliance, 2008). Looking to expand their activities in other areas, the NGO decided in 2002 to target coffee as an industry in which they could build on this collaboration experience, centred on working 'with' corporations instead

of 'against' them in the belief that this would be a more effective approach to promoting change.

We thought this was an interesting idea. Using essentially our standards for social and environmental conservation and labour using, and using their expertise to add quality to those basic sustainability standards (CE-NG-1).

Among coffee suppliers, the level of interest in the topic varied significantly. Some of the suppliers were active in this area, initiating projects on the topic. For example, Ecom, one of the world's largest traders of coffee, had started an analysis of environmental and social sustainability conditions in Costa Rica and two senior company leaders were particularly open to new initiatives. But many suppliers were admittedly less interested in addressing the topic. As one of them expressed:

We've certainly placed more emphasis on this sort of programmes only recently and we are playing a bit of catch-up, we didn't see the strategic importance of this before (CE-EX-7).

A final important context factor at the time was a series of pre-existing linkages between actors, both at the organization level as well as at a personal level. Suppliers had a pre-existing commercial relationship with Nespresso. Also, through previous job experiences, several managers had linkages with some of the supplier and producer organizations.

Table 3-9 summarizes the context conditions found in the initial phase of the programme, marked by a high level of environmental uncertainty and a strong vision and motivation to engage in an initiative combining quality and sustainability.

Table 3-9: Summary: Initial context

	Initial (2002-05)			Supporting evidence, references
Context	External	High environmental uncertainty	<ul style="list-style-type: none"> • Coffee crisis • NGO pressure • High uncertainty on sustainability initiatives 	<ul style="list-style-type: none"> • Industry references: • Ponte 2004 • Muradian and Pelupessy 2005 • Giovannucci and Ponte 2005/6 • Interview references: • CE-NN-1, CE-NN-5, CE-EX-7, CE-CN-1, CE-EX-5
	Actors – Organizations	Few, non-overlapping Pre-existing relationships	<ul style="list-style-type: none"> • Nespresso, 2 suppliers, 1 NGO • Both suppliers already selling to Nespresso, pre-existing personal and organizational relationship • Trust based on previous relationship and reputation 	<ul style="list-style-type: none"> • Document references: • JA-3, SR-1 • Interview references: • CE-NN-2, CE-CN-1, LO-EX-22, CE-EX-2, CE-NN-6, LO-EX-11
	Actors – Individuals	Vision, motivation	<ul style="list-style-type: none"> • CEO supports and leads project • Motivation among key employees to create ‘something new’ • Consultant could play a linking role between organizations 	<ul style="list-style-type: none"> • Document references: • SR-1, NR-2 • Interview references: • CE-CN-1, CE-NN-1, CE-NN-6, CE-NN-2, CE-NN-7
	Internal Nespresso	High growth, High Strategic importance of coffee	<ul style="list-style-type: none"> • Control of supply chain operations • Nespresso’s need to secure long term supply of high quality coffee • Get closer to coffee farmers 	<ul style="list-style-type: none"> • Document references: • SR-1, NR-2, • Interview references: • CE-NN-2, CE-CN-1, CE-NN-1, CE-EX-2
	Internal other actors	Parallel sustainability efforts Seeking profitability	<ul style="list-style-type: none"> • Initial activities in one region • Coffee crisis pressures traders to find new opportunities for differentiation and increased profitability • NGO seeking to work ‘with’ firms seeks partners in coffee industry 	<ul style="list-style-type: none"> • Interview references: • CE-NN-1, LO-NG-21, CE-NG-1, CE-EX-2, CE-NG-2, LO-EX-22, LO-NG-31, LO-NN-21

3.6.2 Initial negotiation and conditions

Conversations on the topic were initiated with all major suppliers but more intensely pursued with two of them, Ecom and Expocafé. Ecom, a long-time supplier, expressed interest in co-developing a customized approach to fit Nespresso's needs. Expocafé, a Colombian cooperative-owned coffee trader, had recently started selling coffee to Nespresso and its new European representative had had commercial dealings with Nespresso managers in the past. The green coffee manager at Nespresso had also previously worked for Expocafé in Colombia, so there was a good knowledge of the quality of their products and the organization. A series of informal meetings, frequent communication and visits initiated a dialog on the topic with these organizations. The initial traders were joined in the Nespresso AAA Sustainable Programme in 2004 by a Brazilian cooperative, also a long-time supplier of Nespresso.

Initial conversations also started with NGO Rainforest Alliance, though these were handled more cautiously. The company showed initial interest in initiating conversations but the organization represented a new type of actor with whom neither Nestlé nor Nespresso had experience. The consultant thus played a linking role in the initial conversations with Rainforest Alliance, and the dialog was maintained quite informally throughout the negotiations with both the NGO and the suppliers initially involved in the programme.

The NGO could offer an attractive reputational resource to Nespresso, but there were also associated risks. As stated by a Nespresso executive:

If you are linked to an NGO partner, the reputation of that partner becomes very important to you. If the partner had a major issue in one area, this could extremely easily backfire on other organizations they are linked with (CE-NN-1).

At the time of the programme launch, at the end of 2003, a short Memorandum of Understanding (MOU) was signed with RA to develop training sessions, a farm assessment tool and a traceability system. The agreement with Ecom and Expocafé was less specific and included a commitment to cooperate on information of origin, assessment of farms and participation in the pilot project (JA-1, JA-4).

Some areas of the programme, such as a simultaneous focus on quality and sustainability, were clear since its inception. As expressed by a supplier:

Nespresso was very clear in communicating their expectations. The process starts with an AA coffee (just the quality part) and when that has been achieved, the rest of the programme kicks-in (CE-EX-4).

But other programme elements were less defined. In the initial months, the focus of the relationship was on identifying opportunities for collaboration and further defining the key elements of the programme. As expressed by the green coffee manager:

If we had planned all this in detail we wouldn't have moved. We had to do it, or at least start it, have some information and then further develop the scheme (CE-NN-6).

We had to think very quickly of the first projects, they were planned and executed in less than two months, so it was not very organized, but it was a first step (CE-NN-6).

The process was very simple. Let's do it and then figure it out as we go (CE-NN-6).

Resources were also difficult to quantify at this stage and were not clearly assigned to the project by participating organizations:

In the beginning, we didn't know what it would take. Maybe it was better that way. If we had actually had a clear idea of how much effort and cost this was going to take, I don't think we would have ever started (LO-EX-11).

This was a 'garage' programme. In the beginning we just used the budget and resources from our department to get it off the ground (CE-NN-6).

Table 3-10 summarizes the negotiation process and the initial activities of Nespresso's AAA Sustainability Programme, which were characterized by being managed as individual projects with limited overall programme structure or budget.

Table 3-10: Summary - Negotiation and initial conditions

	Initial (2002-05)			Supporting evidence, references
Negotiation and Conditions	Negotiation	Informal with suppliers Formal with Rainforest Alliance	<ul style="list-style-type: none"> Negotiation with Rainforest Alliance supported by external consultant Short documents covering general expectations and commitments 	<ul style="list-style-type: none"> Document references: <ul style="list-style-type: none"> JA-4, JA-1 Interview references: <ul style="list-style-type: none"> CE-CN-1, CE-EX-4, CE-NN-1, CE-NN-5, LO-EX-11, LO-EX-21
	Activities	Project based Assessment Tool building	<ul style="list-style-type: none"> Specific projects in Costa Rica, Mexico and Guatemala Initial tool development led by RA with contributions from other actors Continuous experimentation 	<ul style="list-style-type: none"> Document references: <ul style="list-style-type: none"> NR-7, NR-2, NR-7, NR-8 Interview references: <ul style="list-style-type: none"> CE-NN-1, CE-NN-6, LO-EX-11, CE-EX-1, LO-EX-21
	Resources	Limited resources No planned budget	<ul style="list-style-type: none"> Resources are allocated on an ad-hoc basis by Nespresso and suppliers Nespresso funds RA activities on the project Actors don't have a pre-agreed budget 	<ul style="list-style-type: none"> Interview references: <ul style="list-style-type: none"> CE-EX-2, CE-NN-6, LO-EX-11, CE-NN-1

3.6.3 Initial governance mechanisms

The documents signed among the parties at the time showed limited coverage of reporting or other formal means of communication, dates for activities to take place or a communications schedule.

The MOU signed with Rainforest Alliance (JA-4) and the agreements established with the suppliers (JA-1) in this first phase were characterized by being general in nature, with limited specification of reporting, commitments, communication or decision-making processes.

Since the inception of the programme, however, it became clear for all actors that Nespresso, as the commercial buyer and initiator, would lead the programme and that in consultation with other stakeholders the organization would define the direction, scope and coordination mechanisms involved.

In the beginning, my role was to make sure everybody understood why we led this thing. We led because we are the ones who need to buy the coffee. We are the ones that can say it is the right region to participate because they have the right quality. And we can only fulfil our buyer's role if the quality is right... (CE-NN-5)

The few actors participating in the first phase of the programme were involved in very intense communication. This communication consisted mainly of video calls, telephone conference calls, continuous e-mail exchanges and one-to-one telephone calls.

At the time it was not as if we had scheduled conferences or anything like that. At any point someone would pick up the phone and figure out what was going on (CE-EX-2).

There were also several opportunities for face-to-face interaction between organizations, both at the central level and locally, at producer country locations. Participants appreciated these events as they offered an opportunity to get to know each other better.

The workshops were very useful, not only to know the process better but also to get to know the other people working on this in Latin America (LO-NG-31)

Governance or coordination mechanisms were mostly informal at this phase, relying on norms rather than on formal coordination mechanisms.

I think at the time Nespresso was also quite an informal organization, and that was also how it communicated with others. It was very much based on already knowing some people and having common interests (CE-CN-1).

I would say that the vast majority, the overwhelming majority of what we did was informal... It was exploratory, it was conversational, it was relational and it was in the spirit of let's try out a few things, let's test a few things... (CE-NN-1)

As Table 3-11 summarizes, a combination of pre-existing relationships, strong motivation and leadership supported an informal governance structure with frequent

but generally unstructured communications and a series of relationship building face-to-face events.

Table 3-11: Summary - Initial governance mechanisms

	Initial (2002-05)			Supporting evidence, references
Governance	Network governance	Actor-led network (Nespresso)	<ul style="list-style-type: none"> Nespresso leads organization and operation of network Additional sources of power held by other actors (resources, institutional/ reputation) 	<ul style="list-style-type: none"> Document references: <ul style="list-style-type: none"> JA-1, JA-4 Interview references: <ul style="list-style-type: none"> CE-EX-4, CE-NN-1, LO-EX-21, CE-NN-5, CE-CN-1, CE-EX-2
	Governance Mechanisms	Mostly informal mechanisms	<ul style="list-style-type: none"> Continuous communication Relationship building based on previous relationships and frequent meetings, communication All individuals in the network communicate directly with each other 	<ul style="list-style-type: none"> Interview references: <ul style="list-style-type: none"> CE-EX-1, LO-NG-21, LO-CO-31, LO-CN-21, CE-NN-3, CE-NN-6

3.6.4 Context evolution

The external context evolved from 2002 to 2005 with sustainability initiatives in the coffee sector continuing to expand and starting to reach more mainstream industry actors. As expressed by a representative of a large coffee trading company:

The trends are quite startling... normally the coffee industry is quite a mature industry, trends happen slowly, but this has happened very, very fast by coffee standards (CE-EX-5).

Large coffee roasters such as Kraft and Nestlé announced partnerships to source a small percentage of their green coffee under certification schemes run by NGOs (Kraft, 2005; Nestlé, 2005). In 2004 one of the major global coffee buyers, Starbucks, launched its 'Coffee and Farmer Equity Practices' (CAFÉ) (Starbucks, 2004) and by 2005 the programme already accounted for almost 25% of the total purchases of green coffee (Starbucks, 2005). This had a strong impact on suppliers:

Starbucks came and said that they would favour suppliers that made an effort with the CAFÉ practices programme. And that certainly rang a lot of bells in our brains. We expanded the CAFÉ practices and gained a lot of experience during this time (LO-EX-11).

I think we know that at some point in time every producer will have to be associated with some type of certification (CE-EX-7).

The original actors in the programme were overall very satisfied with the programme and the relationships among the different actors. Factors that were cited as being important in this assessment were the premiums paid by the firm, Nespresso’s continued growth, high level of enthusiasm among the partners, and the good relationship and respect that existed among actors.

The stakeholders remained very motivated in the programme. Why? Price. Whoever doesn’t admit that this was a major motivation is just lying. But beyond the financial benefit, there was also an opportunity to differentiate (LO-EX-11).

There was an amazing level of dynamism, business acumen and relationship skills in the initial group of organizations that started this. These guys really stood out (CE-CN-1).

But there was also a feeling among participants that the programme should evolve from a series of relatively independent projects to a more consistent global programme. RA was also interested in increasing cooperation by further integrating its own certification process. The flexibility with which the programme was handled required intense and frequent communication among actors and resulted in certain inconsistencies, and this was starting to generate some frustration. As one of the participants expressed:

Sometimes we would end up playing broken phone, and it was not easy anymore to get all the involved parties in a videoconference on short notice (CE-EX-2).

In 2006 we went through some growth pains. In the beginning when it was just Costa Rica and Colombia, it was easy to communicate, we knew each other from the beginning, and it was easy. But now we had different partners, people in three continents, multiple organizations and operating styles, this can create some growth stress (CE-NN-5)

Table 3-12 summarizes the characteristics of the evolution of the context surrounding Nespresso’s AAA Programme, marked by lower environmental uncertainty and increased number of new actors participating in the programme.

Table 3-12: Summary - Context evolution

	Evolution (2005-07)			Supporting evidence, references
Context	External	<p>Lower environmental uncertainty</p> <p>Multiple competing sustainability programmes</p>	<ul style="list-style-type: none"> • Coffee prices recuperate • Mainstream actors initiate sustainable sourcing practices • RA expands to more agriculture sectors and expands use of own seal 	<ul style="list-style-type: none"> • Document references: • SR-2 • Interview references: • CE-EX-7, CE-EX-5, LO-EX-15, LO-EX-27,

	Evolution (2005-07)			Supporting evidence, references
			<ul style="list-style-type: none"> Starbucks CAFÉ practices growth 	CE-NN-1, CE-EX-2, CE-EX-6
	Actors – Organizations	Multiple, sometimes overlapping actors	<ul style="list-style-type: none"> Nespresso, 6 suppliers, 6 NGOs, 1 Multilateral Organization, 1 Consulting company 5 countries, 10 clusters Pre-existing relationships complemented by new relationships 	<ul style="list-style-type: none"> Document references: <ul style="list-style-type: none"> SR-2, NR-1, NR-3, NR-4, NR-6 Interview references: <ul style="list-style-type: none"> CE-NN-1, LO-NN-12, CE-EX-5, CE-EX-2
	Actors – Individuals	Vision, motivation Professionalism	<ul style="list-style-type: none"> New green coffee manager New positions get created in most organizations specific to the programme, attracts individuals with high motivation and specialized in the topic 	<ul style="list-style-type: none"> Document references: <ul style="list-style-type: none"> SR-1, SR-2 Interview references: <ul style="list-style-type: none"> LO-EX-15, LO-EX-27, CE-NN-5, CE-ML-1
	Internal Nespresso	High growth Limited internal awareness of programme outside supply-chain	<ul style="list-style-type: none"> Business profitably growing at +35% per year Increased targets of supply through AAA Programme to 50% of total by 2010 Increased external and Nestlé recognition of programme 	<ul style="list-style-type: none"> Document references: <ul style="list-style-type: none"> SR-1, SR-2, NR-6, NR-5 Interview references: <ul style="list-style-type: none"> CE-EX-2, CE-CN-1, CE-NN-6
	Internal other actors	<p>Large actors increase interest in sustainability</p> <p>Limited internal awareness of programme outside point of contact</p>	<ul style="list-style-type: none"> Increased experience from working in multiple sustainability programmes Growing importance of establishing longer term relationships with buyer Nespresso's AAA Sustainability Programme not yet part of core operations for most actors 	<ul style="list-style-type: none"> Interview references: <ul style="list-style-type: none"> CE-EX-7, CE-EX-5, LO-EX-15, LO-EX-27, CE-NN-1, CE-EX-2, CE-EX-6

3.6.5 Evolution of conditions

Between 2005 and 2007 the programme evolved significantly, expanding the number and type of actors involved, increasing the number of clusters and structuring programme activities. In 2005 a new green coffee manager arrived at Nespresso, taking over from the previous manager who moved on to a new function in Nestlé. In retrospect many viewed this as a turning point in the evolution of the programme. As expressed by a participant:

This thing was growing and growing, and it started to need some discipline. He was the person to do it (CE-NN-1).

The new manager led a reorganization of the programme focused on four main thrusts: 1) defining the process through which a cluster is initiated and managed; 2) refining the farmer's quality assessment tool, including a self-assessment tool for farmers; 3) setting up key performance indicators (KPIs) to measure progress of the clusters and of the organizations involved; and 4) establishing formal contracts with partners that included the achievement of these KPIs. As he himself expressed:

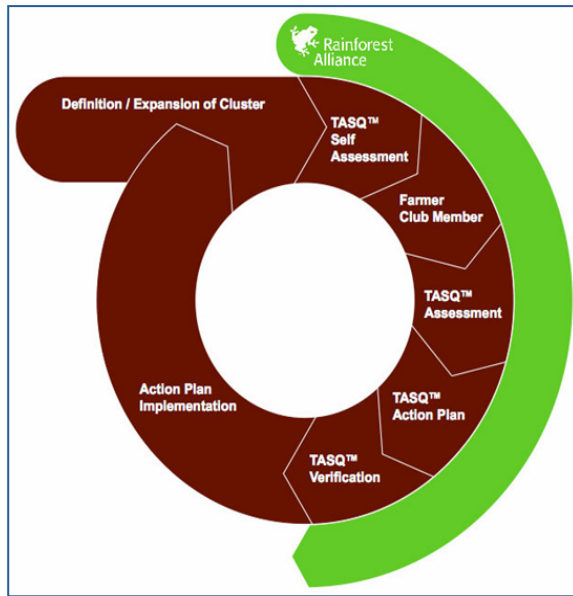
When I came on board I saw a lot of great initiatives but I felt we needed to know where the programme was heading and the CEO expectations. Once we knew this, we started to bring some structure to the programme. If you really want to do something big and solid, you have to put some structure and think about processes (CE-NN-5).

The Tool for Assessment of Sustainable Quality 'TASQ' was further developed and a seven step 'TASQ Cycle' based on the concept of continuous improvement was introduced (Figure 3-8). The introduction of this structured process was welcomed by suppliers and by Rainforest Alliance, clarifying the different steps that, until then, were only implicit. As a supplier said:

The definition of the programme 'wheel' was fundamental. Then we could see at which stage of the programme we were, what came next, and who was working on what (CE-EX-4).

Expansion of the programme also involved expanding the scope of activities to include the National Coffee Federation of Colombia (FNC) and, a little over a year later, two of the largest global coffee suppliers, Neumann Kaffee Gruppe and Volcafé ED&F. Local representatives of the Sustainable Agriculture Network (of which Rainforest Alliance holds a Secretariat position) also joined the programme to act as local resources in Guatemala, Colombia and Brazil. An additional technical assistance NGO, Technoserve, also joined the initiative to support development of the programme in the Caldas cluster.

Figure 3-8: TASQ - Tool for Assessment of Sustainable Quality



Source: (Nestlé Nespresso, 2008)

Negotiations with these new actors were indeed much more structured, with clearer objectives and responsibilities, and a clearer definition of activities and quantification of KPIs. As expressed by one of the new entrants:

The framework for action has been very clear from the start. That is very positive, it helped us a lot in getting started in the programme (LO-EX-15).

As many of the upgrade projects required financing, multi-lateral development organizations were approached as a way to leverage funds invested in the programme and an initial cooperation agreement was established with the International Finance Corporation in early 2007.

Definitely at a certain stage it is very important to have persistency and to be passionate, but at a certain stage it is simply money. This money can only come from partnerships, that is why the whole topic of Public-Private Partnerships needs to be reinforced (CE-NN-3)

There were, however, mixed feelings about the introduction of a different type of organization to the network. As expressed by one of the traders:

There's always been the question of whether to bring in external funding. Should we now bring in the IFC to fund some sort of development, or is that going to be a distraction from the core purpose of the programme? It brings a complete set of new priorities, requirements; a different organization has its own criteria (CE-EX-7).

Table 3-13 summarizes the evolution of conditions as the programme evolved and as activities and resources became more structured after a more formal negotiation process.

Table 3-13: Summary - Negotiation and conditions evolution

	Evolution (2005-07)			Supporting evidence, references
Negotiation and Conditions	Negotiation	Formalized negotiations with all actors	<ul style="list-style-type: none"> Detailed, longer contracts signed with organizations after structured negotiation process 	<ul style="list-style-type: none"> Document references: <ul style="list-style-type: none"> JA-2, JA-4 Interview references: <ul style="list-style-type: none"> CE-EX-2, CE-NG-2, CE-NN-7, CE-EX-7
	Activities	Integrated programme-based	<ul style="list-style-type: none"> Activities structured under cluster assessment and continuous development tool 'TASQ' 	<ul style="list-style-type: none"> Document references: <ul style="list-style-type: none"> NR-9, JA-2, SR-2 Interview references: <ul style="list-style-type: none"> CE-NN-5, CE-EX-2, LO-NN-21, CE-EX-4, CE-NN-7
	Resources	Programme budgets established	<ul style="list-style-type: none"> Most organizations involved have assigned specific budget to the Programme New actors sought after to secure resources 	<ul style="list-style-type: none"> Document references: <ul style="list-style-type: none"> JA-2, NR-3 Interview references: <ul style="list-style-type: none"> CE-NN-7, CE-EX-7, CE-EX-4, CE-NN-3, LO-EX-22, CE-NN-2

3.6.6 Evolution of Governance Mechanisms

In terms of governance mechanisms, the evolution involved moving from an almost exclusive use of informal mechanisms to expanding formalization and structured coordination mechanisms.

A more detailed Terms of Agreement document was signed in 2005 between RA and Nespresso (JA-3) assigning specific responsibilities to the parties (Nestlé Nespresso and Rainforest Alliance 2005). A Supplier Shared Commitment document followed later (JA-2), also identifying specific commitments by Nespresso and a set of commitments by the supplier (Nestlé Nespresso, 2007).

Coordination tools also included objective setting sessions and periodic performance reviews. Structured annual review meetings with suppliers also brought a new level of formality to the process. Beyond specific quality specifications, the KPIs were based on nine qualitative and three quantitative criteria (Nestlé Nespresso, 2007) and included detailed information such as number of farms, agronomists dedicated to the

project and workshops organized. Product traceability and financial transparency also became part of the increased specificity of the programme.

The increased emphasis on coordination, processes and metrics was intended to increase efficiency of the programme and allow it to grow beyond the initial group of actors.

If I'm talking to Supplier A and I want to do projects with them in 4, 5 or 6 countries, I can't talk with each managing director... we asked for some structure in place where we have someone overlooking the project from their overall perspective (CE-NN-5).

RA is a network of organizations... so they have local organizations... we convinced them that they should establish sort of key account managers so we now have a person, based in Guatemala, looking at all these different project (CE-CN-1).

In addition to the formal communication and coordination process, there was also an explicit intention to continue building relationships among the various stakeholders. Relationship building activities, which in the first stage occurred naturally, were part of the programme planning activities that were undertaken during the second phase. For example, a series of field visits during the period organized at different levels of the organization were highly appreciated by local actors. As a local representative of a large supplier said:

Nespresso executives came here to visit during a local coffee conference. They explained the programme, they interacted with the local people and they organized a coffee tasting. That was very powerful. People cannot fall in love with something they don't see (LO-EX-22).

There were also a series of meetings or encounters organized around different industry events. A first stakeholder forum bringing together the leadership of all organizations was held in Switzerland in 2005, and a second one took place in Costa Rica in 2007. A technical meeting, attended also by field agronomists, was organized in Colombia in 2006. These relationship-building activities were appreciated by the organizations:

The whole interaction process has been very good, including the workshops that were done here, those that were held in Switzerland and in other countries and which our agronomists attended. These events were fundamental in our relationship (LO-EX-31).

Similarly, the objectives of the stakeholder forum in Costa Rica in October 2007 expressed a desire to establish closer links among stakeholders:

The second stakeholder forum held in Costa Rica in October 2007 to honour a commitment made at the first Forum to reconvene after two years and to ensure there would be an opportunity to share experiences and best practices across the wider network of stakeholders. The process of stakeholder engagement is ongoing. The Forum itself is not the process, but an additional tool to accelerate a process that continues before and after (SR-2).

By the end of 2007 the organizations involved were very positive about the results achieved and the potential of the relationship. Some of the ‘first entrants’ to the programme, however, had a difficult time accommodating to new rules of the game:

The oldest clusters started before we had the concept of continuous improvement, we hadn't finished the TASQ tool, or the self-evaluation. In the end, the old ones paid for the consequences because we had to reinitiate a lot of things (CE-EX-2).

Overall, there was a general feeling of satisfaction and new questions were raised about entering a ‘third phase’ of the programme:

If in the bag you put not only the price of coffee but also the relevance of the programme and the vision towards the future, we can definitely say that we are very happy we are part of this programme (CE-EX-4).

My belief is that if we want to be consistent then we should not only look at sourcing of the coffee but inherently to the whole company and the way it is doing business. Starting for example with all the packaging issues, recycling, carbon emissions, etc (CE-NN-1).

Table 3-14 summarizes the evolution of governance mechanisms in the second phase of the programme. The network continued to be led by Nespresso and an increased use of formal mechanisms accompanied a drive towards increased scale and efficiency. At the same time, however, the relationship building activities continued, sustaining new interpersonal relationships and establishing increased trust among participants.

Table 3-14: Summary - Governance mechanisms evolution

	Evolution (2005-07)			Supporting evidence, references
Governance	Network Governance	Actor-led network (Nespresso)	<ul style="list-style-type: none"> Increased power due to multiple sourcing options Suppliers also increase power by option to sell to buyers like Starbucks RA maintains (or grows) reputational power 	<ul style="list-style-type: none"> Interview references: CE-EX-7, CE-EX-5, LO-EX-15, LO-EX-27, CE-NN-1, CE-EX-2, CE-EX-6
	Governance Mechanisms	Increased use of formal mechanisms Promotion of relationship building activities	<ul style="list-style-type: none"> Increased formal governance mechanisms, detailed contracts listing activities, targets, responsibilities Formal annual review meetings with suppliers and RA Defined lines of communication both at different levels and geographically 	<ul style="list-style-type: none"> Document references: SR-2, JA-2, JA-3 • Interview references: CE-EX-2, CE-NG-2, CE-NN-7, CE-EX-7, LO-EX-22, CE-EX-4, LO-NN-21, LO-NN-12

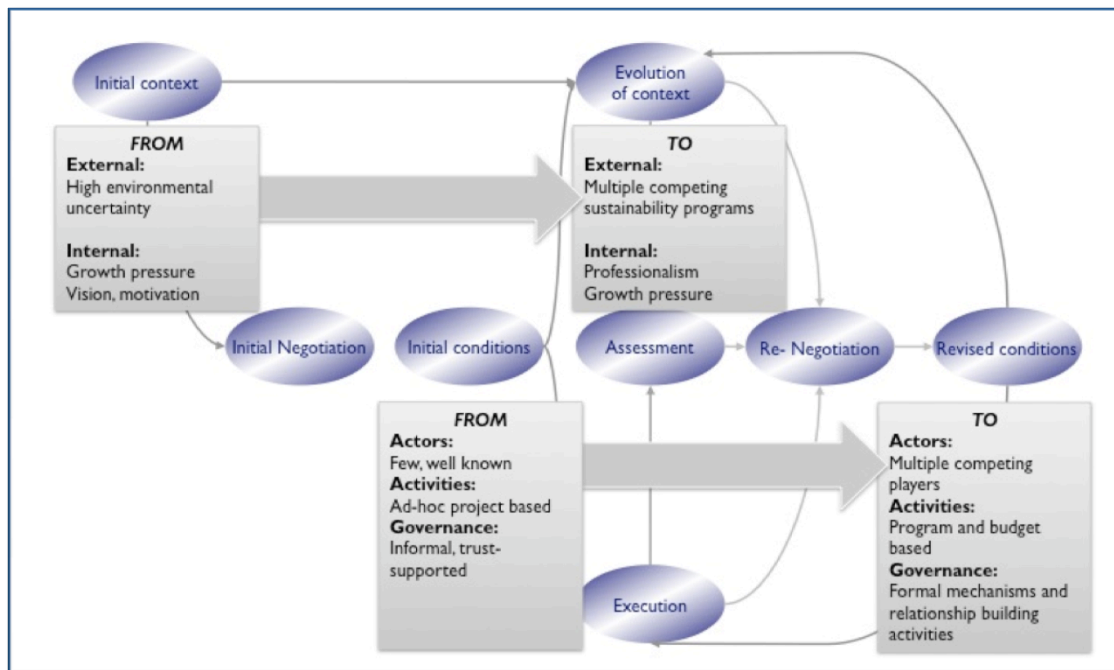
Evolution (2005-07)			Supporting evidence, references
		<ul style="list-style-type: none"> Stakeholder forums, technical meetings and visits to the field stimulate and supports informal relationships and trust building 	<ul style="list-style-type: none">

3.7 Conclusions

The research started by asking how and why governance mechanisms evolve in a multi-stakeholder network in a context marked by uncertainty. Literature on network governance and network dynamics was reviewed to identify causal mechanisms proposed by the different theoretical perspectives. Based on this literature, a framework was developed to analyze the case of Nespresso’s AAA Sustainability Programme.

The research findings are summarized in Figure 3-9, highlighting the co-evolution of context and relational conditions. The context, associated with changes in the external (environmental) and internal (actor-specific) contexts evolved in terms of decreased uncertainty and associated increased clarity in terms of the context supporting the relationship. At the same time there was an increased complexity in the number and type of actors involved. Associated with this evolution, important changes were observed in the relational conditions. An expanding scale and scope of activities was observed and, supporting this expansion, an increased formalization of the governance mechanisms was associated with the network.

Figure 3-9: Evolution of context and relational conditions



Based on the research findings, three propositions are formulated with regard to the literature:

First, in conditions of uncertainty, flexible conditions and the use of informal governance mechanisms supported by trust can facilitate a search and experimentation process.

Clarity on opportunities associated with the objectives and scope of collaboration, resources required, contributions of individual parties, and the benefits of collaboration have been considered important factors in determining the initial structure of the network and the success of the relationship (Kumar and Anderson, 2000; Human and Provan, 2000; Doz and Hamel, 1998; Bryson et al., 2006).

Nespresso's AAA Programme was initiated with small experiments, pilot projects and ad-hoc budgets. Far from determining its failure, this flexibility helped the actors shape the programme incrementally instead of doing so at the outset, when uncertainty was too high. It also permitted, as proposed by Doz (1996), initial conditions that allowed maximum learning for all parties involved.

The initial structure was supported mostly by informal coordination mechanisms. These have been found to be effective in providing confidence to a party that relinquishing control will not create a condition of vulnerability and to increase confidence (Heide and John, 1992), but they are generally viewed as an evolution of a relationship and not as a governance mechanism with which to initiate one. Further, much of the network literature, especially in TCE, states that under conditions of uncertainty individual party interests can be protected through formalized governance mechanisms (Williamson, 1975; Williamson, 1979).

This was not found to be the case in the initial negotiations of the AAA Programme, with relatively vague MOUs being drafted at the time of the programme launch and limited use of formal reporting or communication structures. In an environment of high context uncertainty, governance mechanisms were mostly informal during the initial phase. Behavioural uncertainty, however, was considered lower between Nespresso and the initial suppliers involved in the programme because of their previous history, supporting the view that repeated ties between partners increases the level of trust and lowers the need for formal mechanisms (Granovetter, 1985; Gulati and Gargiulo, 1999; Gulati, 1998; Gulati, 1999).

In line with this literature, trust was found to be an important element in defining the initial conditions and governance mechanisms. Somewhat at odds with this finding, however, is the fact that the agreement and coordination mechanisms established between Nespresso and NGO Rainforest Alliance were also quite flexible and informal. In this case the company did not have any prior relationship and establishing relationships with NGOs was considered risky at the time. One possible explanation for this can be found in the comments of some respondents who alluded

to the linking role played by the consultant. This would support McEvily et al.'s (2003) concept of trust transfer where the trusted consultant was instrumental in setting up and building an initial dialogue with Rainforest Alliance, establishing communication lines and an initial level of trust.

Second, formalization of governance mechanisms at a later stage in a relationship can promote clarity and efficiency, and facilitate expansion of the scale of collaborative activities.

In the research case, formalization of governance mechanisms was associated with a need to increase the number of parties involved, to enable measurement of identified specific objectives, and to bring clarity to current and new actors involved in the relationship. As collaboration developed from an experimental and project-based initiative to a more structured and more comprehensive programme, governance mechanisms were found to co-evolve with the specificity of objectives and the complexity of parties involved.

Contrary to what much of the literature suggests, formalization and supplemental agreements in this case were not actually designed to deal with misunderstandings and conflicts (Ring and Van de Ven, 1994) or to rebalance the relationship (Ariño and de la Torre, 1998) but rather as a way to facilitate sense-making and deliberate articulation (Weick, 1995; Viaar et al., 2006; Palakshappa and Gordon, 2006) and to set the basis for expansion of the programme.

Third, initial relationship quality among actors can be enhanced and extended to new actors through structured opportunities for informal encounters.

Relationship quality, as proposed by Ariño and de la Torre (1998), is the result of an initial store of goodwill and actual observations of behaviour over time, which acquires more importance as time progresses. In the research, relationships predating the programme facilitated the relationship in the first phase. As the programme evolved, however, organization and promotion of relationship and trust-building activities such as field visits, stakeholder forums and informal gatherings, were planned into the structure of the programme, enhancing relationship quality among actors.

3.8 Managerial implications

The research also has implications for managers involved in creating or managing network relationships. The case highlighted the importance of treating governance mechanisms not as a fixed variable to be determined once and for all in the beginning of a relationship, but rather to adapt the coordination mechanisms to the external and internal contexts of the relationship and the characteristics of the task at hand. By understanding these variables organizations can adjust the governance mechanisms to support objectives that may also vary as the relationship evolves, as it

was the case for the Nespresso network, maintaining informal coordination mechanisms to allow increased experimentation in an earlier phase while formalizing coordination mechanisms as the number of actors in the network increased and improved efficiency was sought.

The concepts of pre-existing relationships and social embeddedness, as presented in the literature review and the research findings, are not new but they are all too often not considered explicitly in the creation or evolution of relationships. Managers can benefit from explicitly considering these relationships (as resources but also as biases) that can play a role in specific phases of a relationship, and consider aligning the interpersonal relationships with the inter-organizational ones and identifying 'boundary-spanners' in relationships.

3.9 Summary of research questions, findings and propositions

The findings of the Project are presented in Table 3-15, summarizing the findings to each of the questions and the propositions formulated.

Table 3-15: Summary of research questions, findings and propositions

Question	Research Findings	References in thesis
How does a context of high uncertainty influence the definition of governance mechanisms in a network?	<p>Research findings:</p> <p>In context of high uncertainty governance mechanisms relied initially on informal means of coordination to promote experimentation.</p> <ul style="list-style-type: none"> Nespresso's AAA Programme was initiated with small experiments, pilot projects and ad-hoc budgets. Far from determining its failure this flexibility helped the actors shape the programme incrementally instead having to do so at the outset when uncertainty was too high. Over time, context evolved to decreased uncertainty and associate increased clarity in terms of the context supporting the relationship. Trust derived from previous personal and commercial relationships (with suppliers) and transferred trust from the consultant to the NGO contributed to informal mechanisms being able to be used to manage initial relationship. <p>Proposition:</p> <p><i>In conditions of uncertainty, flexible conditions and the use of informal governance mechanisms supported by trust can facilitate a search and experimentation process.</i></p>	Section 3.7
How and why do network governance mechanisms evolve over time?	<p>Research findings:</p> <p>Governance mechanisms evolved to include more formal mechanisms to provide clarity, increase efficiency and allow growth.</p> <ul style="list-style-type: none"> Formalization of governance mechanisms associated with a need to increase number of parties involved, enable measurement of identified specific objective and to bring clarity to current and new actors involved in the relationship. As collaboration developed to a more structure and more comprehensive programme, governance mechanisms were found to co-evolve with an increased specificity of objectives and increased complexity. 	Section 3.7

	<p>Proposition: <i>Formalization of governance mechanisms at a later stage in a relationship can promote clarity and efficiency, and facilitate expansion of the scale of collaborative activities.</i></p>	
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3.10 Limitations and future avenues of research

As this is a single-case study research, obvious caution needs to be applied to generalizing any findings beyond the specific context studied. However, as Eisenhardt and Graebner point out, in a single-case study ‘the purpose of the research is to develop theory, not to test it, and so theoretical sampling is appropriate (Eisenhardt and Graebner, 2007, p.27)’. It is, however, a limitation of this type of research and conclusions should therefore be considered with the appropriate caution.

An additional methodological research limitation is the limited number of actors involved in the overall network. Even though assurances of confidentiality were given and efforts to protect the privacy of respondents were made, the reduced number of actors in the network is likely to facilitate linking specific actors to statements made, and some of the respondents could have been more cautious than in an anonymous, large sample questionnaire. Though this was addressed via triangulation of data and relatively long and semi-structured interviews, it is nevertheless a limitation of this type of research. I believe, however, that the specificities of the case and the inclusion of multiple actors that participated at different times, multiple positions and multiple locations contribute to the richness of the data and uncover interesting avenues for further research.

Beyond replicating the analysis on other successful and failed initiatives, another avenue of research could involve exploring further the role of power in the relationship. Nespresso’s AAA Programme was clearly led by one actor. Even though different sources of power facilitated increased bargaining power of other actors, especially the NGO, the question arises as to how a more balanced distribution of power among actors would impact the selection of governance mechanisms and their evolution over time and how, in turn, this would be related to the other conditions.

Also, the case of Nespresso comprised different types of actors, including multiple public and private institutions, and grew to include competitive suppliers. The impact this had on the role and complexity of governance is a further area to be investigated. Changes in the size and diversity of the network over time and their impact on relationship conditions can provide a fruitful avenue of research.

As Salk (2005) expressed, research that addresses the evolution of relationships over time has been ‘often called for but rarely chosen’ (Salk, 2005, p.117). The case of Nespresso’s AAA Programme highlights the potential benefits of this type of research to develop an understanding of the evolution of relationships in a network and it raises important areas for further research.

4 Project 3 – Network structure dynamics and multiplex relationships

4.1 Abstract

Purpose:

This document reports on an empirical longitudinal research on a sustainable sourcing network established by Nestlé's specialty coffee subsidiary, Nespresso. It explores the co-evolution of commercial, personal and sustainability programme ties among actors and analyzes the influence played by context factors, managerial action and positional power on the evolution of the structural characteristics of the network.

Design/Methodology/Approach:

The research integrated concepts from dyadic and multi-actor network dynamics, and used social network analysis techniques to measure evolution of the network's structure and complexity as well as positional power opportunities.

Findings:

In a context marked by the uncertainty surrounding sustainability programmes, the research showed that pre-existing commercial and personal relationships were favoured in the choice of partners and that these relationships were influential in defining the initial network structure. Power derived by actors that occupied central or brokerage positions in multiplex networks or that were affiliated with competing sustainability programmes also influenced power relationships by moderating or expanding the power opportunities available to central actors in the sustainability programme network. As the sustainability programme network grew in size and complexity, the lead organization acted on its structure by introducing regional offices that increased centralization of the network and enhanced its efficiency.

Research implications:

Based on the research findings, it is proposed that network structure is influenced by personal and organizational ties in parallel networks; that sustainability network structure is influenced by the structure of other sustainability networks through isomorphic pressures; that actors within a network can derive positional power from their position not only in the focal network but also in parallel networks; and that this power can be exerted to shape network structure and governance mechanisms to meet innovation or exploitation objectives.

Practitioner implications:

The research suggests that in seeking partners it would be useful to incorporate information on connectivity with and between potential partners in parallel networks-relationships formed for different purposes. Managers with influence over network structure and governance may also wish to consider consciously whether innovation or exploration is a priority at a given point in time and aim to influence an appropriate network design accordingly.

4.2 Introduction

Interest in inter-organizational relationships and broader networks has increased as organizations consider increased collaboration as a way to seek resources (Barney, 1991; Pfeffer and Salancik, 1978), reduce transaction costs (Williamson, 1975; Cavinato, 1992; Williamson, 1979) or increase market power (Doz and Hamel, 1998; Porter, 1985; Porter, 1998). Beyond corporate alliances and joint ventures among corporations, cross-sector networks have also been proposed as a means to tackle tough social problems (Bryson et al., 2006) and integrate considerations of environmental and social sustainability in supply chains (Senge et al., 2006; Steurer et al., 2005; Alvarez and Wilding, 2008).

Networks with multiple organizations linked through multilateral ties can be connected in ways that facilitate achievement of a common goal (Provan et al., 2007). But identifying if and when such an organization can be an appropriate mechanism may be a difficult undertaking for managers involved. Further, the creation and development of networks can encounter numerous difficulties in areas such as identifying the right partners (Das and Teng, 2000; Lambert et al., 1996b), engaging staff (Waddock, 1988), overcoming fragility of trust among partners (McEvily et al., 2003; Ariño et al., 2001; Das and Teng, 2001), ensuring creation of value through the partnership (Anand and Khanna, 2000; Kale et al., 2001), safeguarding problems as networks grow larger (Gomes-Casseres, 1994), and identifying an optimal size for network governance (Jones et al., 1997).

Increased interest in the subject has resulted in a vast body of literature, with hundreds of articles in academic journals (Barringer and Harrison, 2000; Borgatti and Foster, 2003) advancing the understanding of what networks are and how they are structured. Review articles like Oliver's (1990), Grandori and Soda's (1995), and Borgatti and Forster's (2003) integrate and summarize perspectives on the creation, operation and impact of inter-organizational networks.

Despite progress in the field, however, the literature has often been criticized for presenting mostly a static view of the relationship, offering little insight on the dynamics of collaboration (Barringer and Harrison, 2000; Doz, 1996; Parkhe et al., 2006; Salk, 2005; Reuer and Ariño, 2002; Ahuja et al., 2007), and doing so from a dyadic rather than triadic or whole network perspective (Provan et al., 2007; Human and Provan, 2000). Granovetter also points to the need of extending the embeddedness concept into empirical research and to study what happens in a dynamic process where 'you have to look at how people make use of their location in social networks to mobilize resources in order to achieve their economic goals' (Granovetter, 1990).

This research focuses on a multi-stakeholder programme in the coffee sector organized to introduce environmental and socio-economic considerations in the supply chain, i.e. the 'management of raw materials and services from suppliers to manufacturer/service provider to customer and back with improvement of the social and environmental impacts explicitly considered' (New Zealand Business Council for Sustainable Development, 2003). Nespresso, the specialty coffee wholly owned subsidiary of

multinational company Nestlé, launched a sustainable sourcing project in 2003. The project was called 'Nespresso's AAA Sustainable Quality Programme' and, as one of the first such supply chains in the coffee world, it was developed under conditions of high uncertainty.

Integrating network structure analysis techniques with qualitative analysis of interactional dimensions, this study analyzes the evolution of network conditions over time as a combination of purposeful strategy choices and the evolution of environmental conditions, including the effects of multiple associations among actors belonging to the network studied.

The three questions driving the research were:

- How does a context of multiplex ties among actors influence the creation and evolution of networks?
- How and why does network structure evolve over time?
- How does an actor relative positioning in multiplex networks influence positional power opportunities?

After this introductory section, Section 4.3 summarizes existing literature on network evolution and multiplex relations. Section 4.4 then describes the methodology that was used for the research. After this, a brief introduction of the Research Setting is provided in Section 4.5, and the findings of the research are then summarized in Section 4.5. The document continues with a discussion of the findings in Section 4.7 presenting a series of propositions to theory, and Section 4.8 proposes implications for managers. The document ends with a Conclusion and a final section on limitations and opportunities for further research in Section 4.9.

4.3 Theoretical background

4.3.1 The networks as a unit of analysis

Networks have become a popular subject of study of relationships spanning across organizational theory, strategic management, business studies, economics and sociology, among others. The extensive literature, however, spans across multiple perspectives and 'it is not always clear exactly what organizational scholars are talking about when they use the term' (Provan et al., 2007, p.480).

Network as an organization and network as an approach

A first distinction in the use of the term network refers to its use as a perspective or as a specific organizational type or form of governance (Provan et al., 2007). Network as a form of governance or organization can refer to relationships embedded in a web of economic and social relationships (Borgatti and Foster, 2003) as informal structures that rely mainly on trust and embedded social relationships to protect transactions (Powell, 1990; Jarillo, 1988) or as formally established structures that are governed and goal-directed rather than occurring serendipitously (Kilduff and Tsai, 2003).

Network as an approach, on the other hand, focuses on capturing the relational characteristics of actors in a network. As Burt proposes, 'people and organizations are not the source of action so much as they are the vehicles for structurally induced action' (Burt, 1992, p.5). The social network perspective places its emphasis on the interaction between actors rather than the attributes of the actors themselves (Borgatti and Foster, 2003, p.991). The approach also uses a series of key components such as actors, ties, dyads and triads (Wasserman and Faust, 1994) that help characterize and specify these relationships. Actors in the network are also called nodes and this can refer to individuals, teams, organizations or another unit of study. Ties denote the relationships among the actors and they can represent different types of relationships such as friendship, advice or work. Ties can be strong or weak, direct or indirect, formal or informal, they can link two or more actors simultaneously, and so on. Measurement of the relational and structural properties is proposed as a way to 'distinguish between different types of networks and network structures based on the presence and absence of relationships and thus demonstrate different outcomes that can be expected given the configuration of the network' (Kenis and Oerlemans, 2008).

Relationships within a network and network as a whole

A second distinction in the literature relates to the unit of study. Authors in Transaction Cost Economics and the Resource Based View of the Firm take dyads – relationships between two organizations – as the main unit of analysis (Williamson, 1991; Das and Teng, 2000), even when these dyads may be part of a broader multi-actor organization (Anderson et al., 1994). An alternative approach is the focus on the 'network as a whole' (Kilduff and Tsai, 2003; Provan and Milward, 1995; Soda et al., 2004), analyzing the structures and processes of the entire network rather than on the organizations that compose the network.

For the purposes of this research, networks are considered formally established, governed and goal-directed (Kilduff and Tsai, 2003). The research also adopts the concept of network as a whole as the unit of analysis (Provan et al., 2007; Kilduff and Tsai, 2003). It does, however, incorporate much of the literature that has originated in the study of dyadic relationships where most of the study of inter-organizational relationships resides (Provan et al., 2007; Kenis and Provan, 2006) and which has informed much of the research on networks.

Additional information on these definitions and other terms used throughout this document can be found in 6.1.

4.3.2 Network dynamics – Nature of change

Though most research in this field has traditionally focused on the antecedents and consequences of networks, the dynamics and processes impacting network creation and evolution have started to attract increased attention. As Nohria states, 'the creation of a network is not a one-time event, but rather an evolution and necessitates the understanding of how networks evolve and change over time' (Nohria, 1992, p.15).

A small but expanding body of literature on the topic addresses the nature of network change, the occasions when change takes place, influence of the context and the managerial forces behind this change, and the sources and effects of power in directing or facilitating this change. These topics are reviewed below and set the theoretical basis of the research questions.

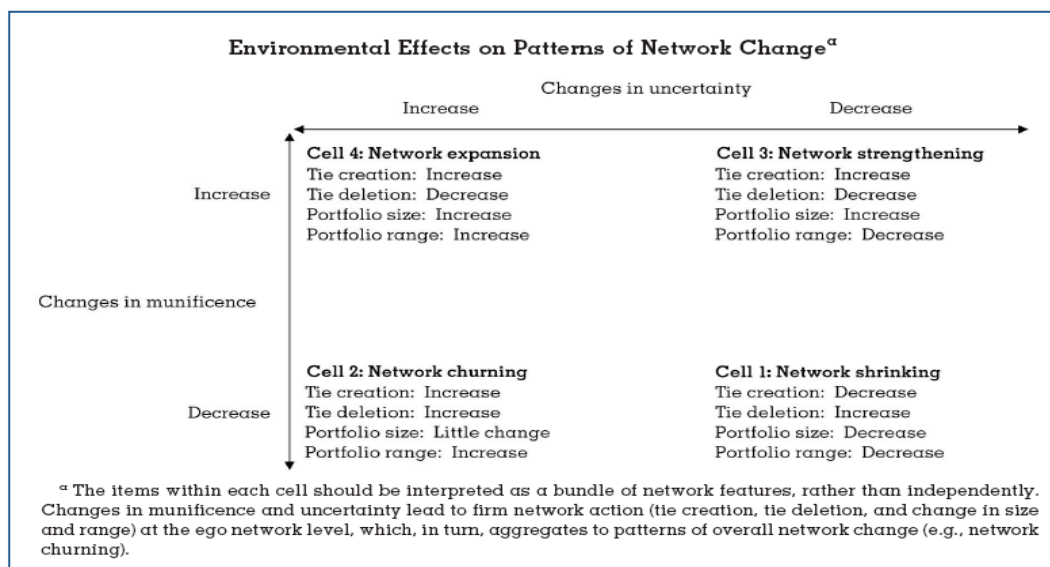
Nature of change

Network change can occur along multiple dimensions. A network can evolve as a result of the entry and exit of actors or nodes, the range of actors participating in the network, and the nature and type of ties among these actors. It can also evolve as a result of its structure conditions. Purposeful action based on evolving goals pursued can also lead to resources and linkages being established to pursue these goals and to setting of governance mechanisms to coordinate activities.

Network demographics

A first way to examine network change is to study its demographics. Koka et al. (2006) identify the creation and dissolution of ties and the type of actors in a network as basic variables to describe network change. The authors identify two dimensions – uncertainty and munificence – affecting the opportunities available to firms and the resources available for network action. As Figure 4-1 shows, by combining these variables the authors identify four basic patterns of network change: network expansion (increased ties with varied actors), network shrinking (decreased ties and decrease portfolio range), network churning (increased portfolio range without increasing the portfolio size) and network strengthening (increased ties with narrow range of actors). New ties with new partners can mean radical changes in the structure of a network while more ties with existing partners may mean reinforcement of existing network structure (Koka et al., 2006).

Figure 4-1: Koka, Madhavan and Prescott’s model of network change



Source: Koka, Madhavan and Prescott 2006

Network ties

Ties characterize the relationships among actors and they can represent different types of relationships such as friendship, advice or work. Ties can be strong or weak, direct or indirect, formal or informal, can link two or more actors simultaneously, and so on.

Ties also denote structural characteristics of networks. Centrality, density, sub-groups or cliques and brokerage opportunities are common measures used to explain networks as a whole and from individual actors' perspectives. Centrality can be used to assess the relative position of actors and the degree to which certain actors hold prominent network positions, often associated with power and influence (Freeman, 1979). A highly centralized network can also facilitate integration and coordination (Provan and Milward, 1995). Another measure, density of a network, represents the proportion of all possible ties that are actually present. This measure can give an indication of the degree of cohesion of the network and provide insights on phenomena such as the speed at which information can travel across the network (Wasserman and Faust, 1994). A third commonly used structure analysis technique examines the existence of cliques or sub-groups. Cliques are clusters of three or more actors that are all connected to each other and affect organizational outcomes in ways that are different from dyadic connections (Wasserman and Faust, 1994). Burt (1992) also identifies a privileged position in a network occupied by actors with brokerage opportunities, connecting organizations that would otherwise not be connected and therefore spanning a 'structural hole'.

Ties can also be multiple in nature, and the existence and mix of these may shift over time. For example, actors can have parallel or 'multiplex' simultaneous commercial, personal or information linkages.

The role played by multiplex ties can evolve over time or due to particular circumstances. For example, in entrepreneurship networks, McGrath and Krackhardt (2003) predict that cross-departmental friendship ties will help generate positive response to change in organizations by fostering trust and shared identity. Hite and Hesterly (2001) propose that in the emergent stage of the firm, networks will be comprised primarily of social embedded ties, shifting to encompass a balance of embedded and arms-length relationships over time. Entrepreneurs first address business contacts, family and friends for information and financial resources. Resources are secured relying on social exchange relationships (Larson, 1992; Walker et al., 1997; Larson and Starr, 1993) and interaction between ties in this first phase is mainly grounded on personal relationships, social capital or the history of dyadic interaction, and the identity of the ties matters more than the specific economic functions or resources (Hite and Hesterly, 2001).

Network conditions

Conditions are the 'substance' of the network and include the overall network goals, activities, resources, resource integration, information processing mechanisms (Håkansson and Snehota, 1995; Harland, 1996; Lamming, 1996) as well as knowledge capture (Powell et al., 1996; Senge et al., 2006; Das and Kumar, 2007) and risk and benefit sharing (Grandori and Soda, 1995; Stuart and McCutcheon, 1996).

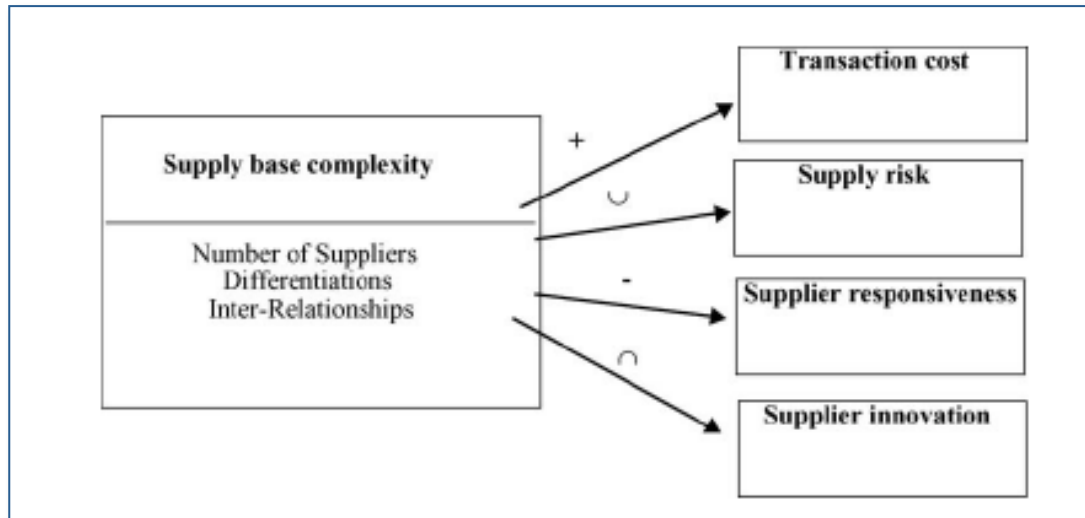
These conditions can evolve in different combinations, but an integrative perspective of evolution of conditions in a network is offered by the model of organization adaptation proposed by March (1991), where the weight given to different activities and resources in inter-organizational relationships responds to the exploration or exploitation nature of the relationship (Koza and Lewin, 1998; March, 1991; Lewin et al., 1999; Koza and Lewin, 1999). Exploration involves innovation, basic research, invention, risk-taking, building new capabilities and entering new lines of business, while exploitation is related to increasing productivity of employed capital and assets and can include activities such as standardization, routinization, defining and measuring performance and cost reduction (Koza and Lewin, 1998; Cohen and Levinthal, 1990; Lewin et al., 1999). The exploration or exploitation nature of the relationship can also vary according to the nature of the sector or the time in the relationship. Lamming, Johnsen, Zheng and Harland (2000) find that in the context of supply networks, the degree of complexity and the need for innovation in different product groups determine the type of partner that will be sought in a supply network. For example, the priority in lower complexity functional products will be cost and therefore the partners being sought and the type of relationship to be established will reflect this condition. Ford (1990) proposes that at different stages in a relationship (sample deliveries, adaptation, scale-up of activities, routinization), different models of relationship and level of interaction would occur.

The question then arises whether conditions in a network can evolve in a distinct pre-specified order or they result from an iterative process of evolution. For example, in the buyer-seller literature, life-cycle theories identify specific phases through which relationships evolve and can involve sample deliveries, adaptations, scale up and routine deliveries (Ford, 1990). Offering another perspective, iterative views of inter-organizational relationship dynamics present these steps not as linear but rather as a repetitive sequence of negotiation, commitment and execution (Doz, 1996; Ring and Van de Ven, 1994).

Network complexity

Changes in structure can also lead to changes in the complexity of the network. In the context of supply networks, Choi and Krause (2006) characterize structure by its level of complexity, measured in three dimensions: 1) size of the network, 2) degree of differentiation, and 3) level of inter-relationships among suppliers. Figure 4-2 reproduces the authors' model. The greater the number of suppliers, the greater their variation, and the greater the level of interaction among the suppliers, the more complex a supply network becomes. Choi and Krause (2006) then propose that a reduction in complexity may lead to lower transaction costs and increased supplier responsiveness but, in certain circumstances, it may also increase supply risk and reduce supplier innovation.

Figure 4-2: Choi and Krause (2006) - Impact of supply base complexity



Source: Choi and Krause 2006

Network governance

Network cooperation decisions are sustained by a set of mechanisms of coordination (Grandori and Soda, 1995). One aspect of governance refers to the distribution of decision-making rights and can range from self-governance to hub-firm or lead-organization governed to a network administrative organization model (Provan et al., 2007; Provan and Kenis, 2008). Governance can also refer to the set of formal (contracts, legal agreements) and informal (norms) mechanisms used to govern the relationships among actors in the network. These can include formal mechanisms such as the specific set of contracts and obligatory arrangements (Ellram and Edis, 1996), the legal structure used to govern the relationship (Nassimbeni, 1998), and informal mechanisms such as the implicit norms of behaviour (Heide and John, 1992; MacNeil, 1981), conventions or standards (Ponte and Gibbon, 2005), pledges (Anderson and Weitz, 1992) and informal cultures and social bonds among managers (Wilson, 1995; Spekman et al., 1998b).

As the network evolves, governance mechanisms can also shift over time. The literature explores two 'paths' for evolution of governance mechanisms. The first, a relatively generalized view that relationships can go on a 'virtuous cycle' where, as positive trust reinforcement among actors occurs, the relationship will tend to depend proportionately more on informal relative to formal governance mechanisms (Ring and Van de Ven, 1994; Inkpen and Currall, 2004; Heide and John, 1992). In the second path, internal or external sources of tension can arise that make the formal mechanisms inadequate. Ring and Van de Ven (1994), in their iterative view of relationships, propose that supplemental agreements are generally established to deal with misunderstandings or conflicts, whilst informal, psychological contracts can become more prevalent in relationships as partners become more committed to each other and to the relationship. Ariño and de la Torre (1998) study a longitudinal case of a failed alliance and propose that external shocks and evolution of relationship quality cause them to either engage in re-negotiation of the terms of contract or to modify their behaviour unilaterally. These

moves to readjust the respective contributions and the alliance's distribution rules will continue until there is a new equilibrium or the relationship is dissolved.

4.3.3 Network dynamics - Drivers of change

Change in networks is generally attributed to a combination of changes in the participating organizations' strategies, institutional organizational, competitive environment and management intent for the relationship (Koza and Lewin, 1998). However, the weight given to each of these factors differs significantly among different positions.

On one end of the spectrum, population ecology perspective explains the adaptation of organizations over time in terms of influential environmental factors rather than as a consequence of individual managerial choices (Hannan and Freeman, 1977). On the other extreme, most of the alliance literature focuses on the actions of alliance managers and network 'architects' as being the major drivers of change in networks, even if this change occurs as a response to changes in environmental context conditions (Ariño and de la Torre, 1998; Williamson, 1979; Inkpen and Currall, 2004; Kogut, 1988; Hamel et al., 1989; Pfeffer and Salancik, 1978).

Context factors

While most of the early research on networks focused on the elements specific to the studied relationship in isolation of the surrounding environment, the context where these relationships take place has been receiving increasing attention since Granovetter's (1985; 1992) focus on the concept of embeddedness. Granovetter develops an earlier contribution from Polanyi (1957) and identifies embeddedness as the degree to which an actor – individual or organization – is involved in a broader social, economic and institutional system and how, in turn, this level of involvement influences (and is influenced by) its behaviour.

The context in which the actors and the relationship are embedded has been identified as a factor influencing which organizations will enter alliances (Powell et al., 1996; Gulati, 1998; Gulati, 1999), which ones are more likely to create ties with each other (Gulati, 1995b; Gulati and Gargiulo, 1999), and how these relationships will evolve over time (Doz, 1996; Ariño and de la Torre, 1998; Ariño et al., 2005). The main context areas that have been identified in the literature as influencing the structure and governance mechanisms of networks are: a) the external macro-economic context, including the type of industry or sector; b) the cultural and institutional environment; c) pre-existing social relationships among individuals; d) relationship-specific factors such as history of relationships or additional types of relationships among actors involved in the creation of a new network.

Macro and institutional context

Macro-trends such as globalization, pace of technology change and shorter product life cycles are important contextual factors supporting the creation and evolution of networks. On this, Transaction Cost Economics refers to uncertainty of exogenous factors

such as uncertain future market conditions as playing a central role favouring the creation of networks (Williamson, 1975). The propensity to create offensive or defensive alliances can also be linked to the type of competitive environment found in the industry, where networks become tools that an organization can use to increase market power or as a defence against power exerted by competitors (Hamel et al., 1989; Benson, 1975; Porter, 1985; Porter, 1998).

Institutional theory places the emphasis of change on institutional pressures on organizations to engage in actions seen as legitimate by other organizations and by the environment in which they operate (DiMaggio and Powell, 1983) whereby organizations retain, adopt, and discard templates for organizing, given the institution field they are in (Baum and Oliver, 1991; Greenwood and Hinings, 1996). Even within a specific industry or sector, changes in practices as well as changes in the regulatory environment can lead to changes in a network (Koza and Lewin, 1998; Garcia-Pont and Nohria, 2002). Networks can also be formed in anticipation of these changes to promote self-regulation or to proactively anticipate regulation in an industry (Lenox and Nash, 2003). The increasing number of networks in a certain context has in itself also been found to be a driver of increased network activity. Di Maggio and Powell (1983) propose that, as more organizations collaborate with each other, isomorphic pressures would impact the propensity of increased collaboration activity in the industry. Further, cultural factors may lead to wider acceptance of collaborative activity in certain contexts, resulting in more opportunities to form ties in some societies and industries than in others (Gerlach, 1992).

Relationship social context and history

Social relationships among individuals and the social context within which an organization operates have been identified as important influences in the economic actions of firms (Granovetter, 1985). The embeddedness of an organization can thus be interpreted not only in terms of a specific relationship within a network but also as the cumulative effect that all the relevant relationships in which an actor participates have simultaneously on its actions (Dacin et al., 1999).

Embedded relationships accumulate into a network that becomes a growing repository of information on the availability, competencies and reliability of prospective partners, and firms placed in a social network of trusting relationships can significantly reduce their search for new partners when they decide to ally with an entity they already trust (Granovetter, 1985; Gulati, 1995a).

Factors in the social and cultural environment have also been linked to network creation and development. Similar organization structure and culture are seen to enhance the probability of creation of a relationship and, moreover, of success in the relationship. Factors mentioned as having a positive impact on a buyer-seller relationship include elements such as similar size, technological sophistication, degree of vertical integration, compatibility of corporate values, philosophies and techniques (Lambert et al., 1996a; Ellram and Hendrick, 1995; de Man and Burns, 2006; Fey and Beamish, 2000; Rábade and

Alfaro, 2006). Still, some authors have found that a cultural fit between collaborating organizations can support the selection and negotiation stages of the relationship by providing a basis on which mutual confidence and trust can develop (Faulkner and De Rond, 2000; Faulkner, 1995). Similarly, situations of low trust have been identified with lengthy and complicated negotiations (Williamson, 1975).

Network position

Nohria (1992) proposes that actions and behaviour of individuals and organizations can be explained, at least partly, in the context of their position in a network. He goes on to propose that variations in the actions of actors can be better explained by knowing the position of actors relative to others in various networks of relationships rather than by knowing how their attributes differ from one another. Three particular aspects of network position that are identified in the literature as impacting the creation of networks are the relative prominence (who is more or less in demand), range (the sum of total actor relations) and brokerage (ability to mediate among disorganized actors) of actors vis-à-vis each other (Nohria, 1992). A structuralist view of networks thus emphasizes changes in behaviour in terms of structural constraints on activity rather than in terms of forces within the units (Wellman, 1988). In this view 'people and organizations are not the source of action so much as they are the vehicles for structurally induced action' (Burt, 1992, p.5).

Changes in network structure have been found to have effects on the outcome of the network and in determining the expansion, change or dissolution thereof. For example, Uzzi (1997) proposes that the loss of a core organization in a network will have a large negative effect on the viability of the network as a whole. Hite and Hesterly (2001) suggest that, in entrepreneurial contexts, networks decrease in density and cohesion over time and the number of structural holes that are bridged increases.

Managerial action

An alternative view on network change places the emphasis on managers as the drivers or 'architects' of the creation and evolution of a network. In this view, the decision to create or modify a network would be driven by a rational and purposeful process and though the external context is a factor considered in the decision, the initial actors, ties, conditions and governance mechanisms and their evolution are driven purely by managerial action.

For example, in the Transaction Cost Economics Theory of networks, managers focus on achieving maximum efficiencies by optimizing the internalization of transaction costs versus contracting via de market (Williamson, 1975; Williamson, 1979; Coase, 1937). Change in the network can be explained as a drive towards a more efficient governance form over time (Cropper and Palmer, 2008). Ariño and de la Torre (1998) also propose that if an alliance is assessed as having a lower value than projected but is still superior to other alternatives, then a corrective action is required to restore efficiency or equity and this will lead to a renegotiation process.

Also in relation to the context in which an organization operates, managers can create and modify networks to increase market power (Hamel et al., 1989; Porter, 1985; Porter, 1980; Porter, 1998), to seek legitimacy vis-à-vis markets or societies in which the organization operates or to manage the needs of multiple stakeholder groups (Freeman, 1984; Jones and Wicks, 1999).

In the Resource Based View of the Firm, organizations establish and evolve relationships with other organizations in order to acquire necessary resources (Das and Teng, 2000; Peteraf, 1993; Pfeffer and Salancik, 1978). Uneven resource acquisition or learning among the actors can impact the level of interdependency and bargaining power (Das and Teng, 2002; Inkpen and Beamish, 1997) leading to a renegotiation (or discontinuation) of the relationship and increasing the likelihood that formal controls will be emphasized by the 'out learned' organization. Resources can reside in specific actors but they can also reside in the network, and knowledge and experience residing in the network can act as catalysts for new alliances (Gulati, 1999).

Most authors in the social network perspective identify structure as a determinant of action in a network. Davis (2008), however, studies the impact of strategic action on structure. He defines 'network plasticity' as the capacity of managers to change social networks inside organizations to achieve organizational objectives. In this view, network managers can influence the number and type of ties in the network and use more redundant ties to ensure stability or dynamic organizational process – such as socialization – to quickly reconstitute broken ties (Davis 2008).

Power

The ability to influence the conditions of a network, including its structure, necessitates an ability to exert the power to create these chances. Though there is limited agreement on a precise definition of power, one general characterization refers to power as the 'ability to influence, control, or resist the activities of others' (2008). In a network setting, it has been observed that a key group of nodes within the network often play a central role as the main carriers of rules and practices (Hendry et al., 1999) and this results in the development of dominant logics at network and community levels (Owen-Smith and Powell, 2004). The concept of power is generally related to the party that has the upper hand in terms of controlling or influencing outcomes at any one time, whether there is a conflict of interest or not (Yan and Gray, 1994). Salancik and Pfeffer (1977) observe that while there may be academic debate on the definition of power, those experiencing the effects of power in the real world seem to exhibit a consensus as to who has it.

Even accepting alternative explicit definitions or implicit demonstrations of influence, the question still remains as to where this power originates in inter-organizational relationships and networks. Power can be formal by nature when one organization has formally acknowledged authority over other organizations in general or within a specific scope of collaboration (Hardy and Phillips, 1998). Huxham and Beech (2008) identify four additional sources of power: 1) need imbalance where one organization has some sort of resource that another one needs; 2) importance imbalance or the level of mutual dependence; 3) structural position in the network; and 4) emanating from day-to-day

activities. In addition to these sources, Huczynski and Buchanan (2007) also point out to power emanating from a specific resource such as the ability to reduce uncertainty for other network actors.

The resource dependency approach (Salancik and Pfeffer, 1977) posits that power derives from control of relevant resources, creating dependency of other actors on these resources where the other actor in the relationship has few alternative sources for acquiring the required resources.

Supply chain literature addresses the role of power in commercial contexts as power based on importance imbalance where the focus tends to be on gaining managerial control over a partner or using power to maintain stability (Inkpen and Beamish, 1997; Yan and Gray, 1994), control the chain and maintain the control of the relationship (Gereffi et al., 2005; Cox et al., 2001; Maloni and Benton, 2000).

Social network theory has predominantly focused on power opportunities derived from actors occupying specific structural positions. Positional power can be available to actors occupying a central position in a network that can be associated with a high level of social capital. This can produce a favourable reputation, which can lead to advantages in tie formation (Kenis and Oerlemans, 2008), and provide benefits derived from access to information and other resources (Brass and Burkhardt, 1992; Benson, 1975). Centrality in a network has also been associated with accumulation of social capital. Social capital is defined as 'the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition' (Bourdieu and Wacquant, 1992, p.119). Opportunities for increased power can also arise from other positions in a network. Burt (Burt, 1992) introduced the concept of 'structural holes' to denote gaps in the pattern of information flows that reflect potentially profitable opportunities for an organization establishing relationships between otherwise unlinked organizations. Structures, however, can facilitate or constrain the exploitation of power (Perrow, 1986). Granovetter points to the need to study what happens in a dynamic process where 'you have to look at how people make use of their location in social networks to mobilize resources in order to achieve their economic goals' (Granovetter, 1990).

Significant changes affecting a network can also relate to changes in the power held by different actors. Reducing uncertainty may create changes in interaction patterns, with those able to cope with uncertainty increasing their power by adjusting their social location (Salancik and Pfeffer, 1977). In an empirical research studying the introduction of new technology in an organization, Burkhardt and Brass (1990) found that the ability to reduce uncertainty for others enabled individuals to gain power and centrality in an organization. In the face of major disruptions, power can also shift to people or nodes that occupy central positions in parallel or multiplex networks. Krackhardt (1992) studies the inter-relation between friendship network and advice network both in a normal situation and in a stressful, dramatic change situation. Dealing with a big change did not require routine information but it did require significant trust, which is better

represented in a philos (friendship) network than in an affectively neutral advice network.

In addition to multiplex ties among actors in a network, power can also emanate from external linkages. Benson (1975) distinguishes power derived from internal network structures from power originated in external linkages of the network organizations to a larger pattern of social organization, able to mobilize forces external to the network as a means of controlling resource flow within it (Benson, 1975). Stearns and Mizruchi (1993) cite the presence of bankers on the boards as influencing other linkages relating to financial dependence on organizational decisions, and networks of equity ownership across organizations and interlocking boards of directors have been linked to potential exercise of collusive power across organizations (Gerlach, 1992; Mizruchi, 1996).

4.4 Methodology

4.4.1 Research methodology

The objective of the research was to analyze the co-evolution of commercial, personal and sustainability programme ties among actors and the influence played by context factors, managerial action and positional power on the evolution of the structural characteristics of the network.

To do this, the research adopted a longitudinal approach, proposed as appropriate to study and explore subjective meaning systems and social processes and to capture the complexities and dynamics of cooperation (Smith et al., 1995).

Data analysis included both qualitative and quantitative methods, following a 'bifocal' approach proposed by Coviello (2005) as a technique to capture change in a network's structure as well as its interactions over time. The quantitative analysis relied on the use of Ucinet 6.207 (Borgatti et al. 2002) to construct matrices representing each type of relationship in the network. Using the functionality available in the software program, these matrices were then analyzed for a series of network constructs. The quantitative analysis was complemented by qualitative analysis, considered appropriate to enhance the understanding of issues underlying collaboration (Parkhe, 1993a), explain causal links in real-life interventions that are too complex for the survey or experimental strategies (Yin, 1994), and enable in-depth examination of the dynamics present in a single and unique setting (Eisenhardt, 1989a; Yin, 1994).

4.4.2 Case selection

The study analyzed the network structure dynamics of the 'Nespresso AAA Sustainable Quality™ Programme', a programme created by global food giant Nestlé's subsidiary Nespresso in 2003. The programme was introduced as an 'effort to secure the highest quality coffee while promoting environmental, social and economic sustainability along the entire value chain, from the farmer to the consumer' (Nestlé Nespresso 2008) and it involved the participation of Nespresso's suppliers, non-governmental organizations, consultants and multilateral development organizations.

Nespresso's AAA Programme was selected based on three considerations: 1) as sustainable sourcing initiatives in the coffee sector are a relatively recent phenomena, it provided an opportunity to observe creation and evolution patterns in a network that underwent a rapid evolution in just 5 years; 2) as the programme was started about five years before the analysis was conducted, it provided enough opportunities to review evolution of conditions and governance conditions while at the same time affording the possibility to identify and interview relevant participants, offering an increased probability that records were kept and memory of key events was fresh enough; and 3) access to key decision makers in all intervening organizations was facilitated, thus allowing a relatively rare opportunity in case research to interview all relevant stakeholders, from farmers at location, to partners, to Nespresso's past and present executives.

4.4.3 Data sources

The three major sources of evidence used for this research – historic records, documents, and interviews – are explained in detail in Section 3.4.3. These sources are among the six outlined by Yin (1994) as primary sources of evidence in qualitative research.

The interview respondents represented a mix of stakeholders, geographies, functions and tenure. In addition to contributing to the richness and variety of the data, this approach is also believed to help mitigate potential biases from informants in the unlikely event that varied informants would engage in convergent retrospective sense-making or impression management (Eisenhardt and Graebner, 2007). Historic records and documents providing additional data were used to complement the views of participants, offering a view of formal governance mechanisms and records of relationship building events as they were announced at the time they occurred.

In addition, a research using public sources was done to identify relationships that AAA Sustainability Network members had established with other coffee sustainable sourcing programmes. Appendix 6.9.1 provides further detail on the websites accessed, the information contained in them and the date on which they were accessed.

4.4.4 Data collection

The sources of data included 15 pieces of documentation or archival records, 48 interviews with stakeholders in all the organizations involved in Nespresso's AAA Sustainability Network and a series of visits to farms and cooperatives participating in the programme.

Interview respondents

The interview list was composed in several phases. After identifying the relevant stakeholder organizations involved, the principal criterion for determining the respondents within these organizations was their experience or knowledge of the programme at any time between 2003 and 2007, even if they were no longer part of the organization. An initial list of respondents was drawn up with a consultant that had been

involved in the programme since its inception. Snowball sampling was used to identify and gain access to the most suitable respondents within each organization.

A total of 48 semi-structured interviews were then conducted with Nespresso executives and representatives of stakeholder organizations directly involved in the programme at any point during the period studied. The respondent set included Nespresso’s CEO and both Programme Managers that were active during the period 2003-07. It also included central, regional and local representatives of five suppliers, two NGOs, two consulting companies and one multi-lateral development organization.

In addition, six farms in Costa Rica and Colombia were visited, and eight farmers and six cooperative managers were interviewed for the project. The farms visited were proposed by the suppliers and therefore may or may not be representative of the rest of the farms involved in the project. Still, they provided a glimpse of how the AAA Sustainability Programme was executed in the field and some of the challenges and opportunities faced by farmers participating in the programme. To complement this data, twenty additional farmers selected by the researcher to represent a range of farms filled out a short questionnaire (Appendix 0). Respondents were assured that information disclosed during the interview would be treated as confidential, thus enabling potentially critical viewpoints about the programme, relationships or other actors to be expressed.

Semi-structured interviews were conducted between June and September 2007. Each meeting lasted approximately 60 minutes, with a handful extending for up to three hours. Of the total number of interviews, 41 were face-to-face meetings in Switzerland, Costa Rica and Colombia, while 7 were done via the telephone. After the first round of interviews, 5 participants were questioned a second time to expand on topics or to clarify their responses. Table 4.1 illustrates the overall organization and geographic representation of the interviews.

Table 4-1: Semi-structured interviews by organization and location

	Central level	Regional/ National	Local/ Farm	Total
Nespresso	8	2		10
Coffee traders	6	6	4	16
Coffee Cooperatives		1	5	6
Farmers			8	8
Consultants	1			1
Non-Government Organizations	2	3		5
Multilateral organizations	1			1
Other		1		1
Total	18	13	17	48

Data were gathered from relationship documents and archival information in the form of contracts, agreements, reports and press releases. Table 4-2 lists the titles and types of the 15 documents included in the research.

Table 4-2: Documents analyzed as part of the research

Document name	Type of document	Year
Agreement with supplier	Agreement/Contract	2003
Anonymous AAA commitment	Agreement/Contract	2007
Nespresso RA Activities 1	Agreement/Contract	2005
Nespresso RA MOU	Agreement/Contract	2003
Public-private partnership Costa Rica	News release	2006
Ixthuplan project	News release	2005
Costa Rica project	News release	2006
News release Miles	News release	2006
Commitments 2010	News release	2006
Awards and Africa	News release	2007
Project report Caldas	News release	2005
Project report San Ramon	News release	2005
TASQ-Fact sheet	News release	2006
Stakeholder Forum Report 1	Report	2005
Stakeholder Forum Report 2	Report	2007

4.4.5 Data analysis

The documents reviewed were all accessible in print or in electronic format and in the English language. The interviews were originally done in Spanish, English and Portuguese. All interviews were taped and transcribed in their original language. The data were then analyzed using data reduction techniques to identify emerging themes and concepts, guided by the research questions.

As Miles and Huberman (1994) suggest, the research questions were used to create a first list of descriptive codes. The initial coding, which can be viewed in Appendix 6.8.1 was used to analyze an initial set of transcripts and documents.

The software tool NVivo Version 8 (QSR International Pty Ltd, 2008) was used for this process. The software has built-in tools for uploading documents, classifying, sorting and arranging information using, among other functionalities, tree nodes and sub-nodes.

Two researchers (one of whom had not been involved in the interview phase) independently coded three representative interviews and two documents. This process sought to identify discrepancies in the interpretation of the categories and to limit the extent of subjectivity that may exist in interpreting semi-structured interview data, as

suggested by Johnsen et al. (2000). Discrepancies and unclear areas were identified using such process. Appendix 6.8.1 reproduces the differences in coding results of two of the three interviews and includes the final coding used to analyze the interview and document data.

At the end of this phase, the entire database was again reviewed to identify any overlaps and ensure relevance of the references to the topic. It was then analyzed looking for patterns and indications to help build explanations for the unique situation and experiences (Yin, 1994). A matrix combining the chronological dimension and the themes emerging from the research was built using an excel spreadsheet, transferring the data from the NVivo database, translating when necessary any Spanish or Portuguese quotes into English and disguising the names of organizations and individuals to preserve privacy and confidentiality.

Project 2 and Project 3 data

The data set coded in Nvivo and summarized in an excel spreadsheet coincided with the one used for Project 2. To clarify the use of information coded, Figure 4-3 highlights the sources and references used.

4.4.6 Preparation of the network data

Ego-centred network

The subject of the research was the creation and development of the Nespresso AAA Sustainable Quality Programme network. As such, the programme is centred on the relationships established by Nespresso as part of this programme and it constitutes what is called an ego-centred network. Using the definition of Wasserman and Faust (1994, p. 42), an 'ego-centred network consists of a focal actor, termed ego, a set of alters who have ties to ego, and measurements of the ties among these alters'.

In addition to the main network under analysis, the AAA Sustainable Quality Programme, multiplex relationships among organizations belonging to the AAA Programme were also analyzed. Two networks, one for commercial relationships and one to represent organizations linked by personal relationships, were constructed and analyzed as part of the research.

Population boundary

The organizations that were considered for the study were those that had direct ties to the Nespresso AAA Sustainable Quality Programme. The boundary of the population under study was set as the organizations that had been 'formally tied' to be part of the Programme. This boundary was easily delimited as only organizations that were invited to participate in the network could join, and this was clearly stated at any point in time.

Figure 4-3: Field research sources and references in Project 3

Tree Nodes

Name	Sources	References
Assessments	5	5
Organization and individual sense-making	32	111
Enhancers	3	4
Inhibitors	1	1
Opportunities and Strengths	24	49
Risks and Weaknesses	22	55
Shared assessment	13	24
Conditions	0	0
Coordination mechanisms	21	69
Formal governance mechanisms	13	45
Informal coordination mechanisms	12	25
Program tasks and activities	49	270
Resources	24	51
Roles and Responsibilities	31	111
Unilateral actions	3	3
Context	0	0
Actors motivations and expectations	38	103
Actors Overall Strategy	25	62
External macro context	13	26
Linkages	6	10
Inter-organizational linkages (in program)	27	96
Inter-personal linkages	13	25
Intra-organization relations	3	4
Other ties between organizations	23	61
Pre-existing organization linkages	1	1
Negotiation	18	40
Formal Contracts & Agreements	14	23
Informal negotiation	8	11
Power	5	10
Results	25	49
Year 2002 and before	1	1
External events	6	16
Organization and individual events	8	20
Relationship events	6	13
Year 2003	1	1
External events	1	1
Organization and individual events	4	5
Relationship events	12	34
Year 2004	0	0
External events	0	0
Organization and individual events	1	1
Relationship events	3	5
Year 2005	1	1
External events	1	1
Organization and individual events	4	5
Relationship events	6	7
Year 2006	0	0
External events	0	0
Organization and individual events	8	10
Relationship events	10	13
Year 2007	0	0
External events	0	0
Organization and individual events	6	6
Relationship events	5	10

 = Coded Field Research data re-visited for Project 3

The Commercial and Personal Networks were built based on the boundary specified for the AAA Sustainability Network, i.e. only relationships among organizations that were part of the AAA Sustainability Network were considered in building the Commercial and Personal Networks. Similarly, affiliation to other sustainability programmes in the industry was only considered for the organizations that were part of the AAA Sustainability Network.

Unit of analysis

The unit of analysis for the research was the network as a whole, with sub-units being the individual organizations. Each organization or sub-unit represented an independent organization or a division of a larger organization or a subsidiary. In the case of firms involved in the analysis, the organizations were disaggregated geographically to regional/national and then local level, and each of these organizations was considered as a sub-unit in the research.

Relational ties

Three specific types of relationships were analyzed in the research:

AAA Sustainable Quality Programme relationships (AAA Sustainability Network): These ties were consultative or collaborative and were established as part of Nespresso's AAA Programme activities. When formal relationships were identified, these constituted the ties included in the network. In the beginning of the programme (2003-05), when these had not been established, evidence of informal communication and coordination among actors (as expressed in the interviews) was considered as ties.

Commercial relationships (Commercial Network): These ties involved an exchange of goods or services for a financial compensation, excluding compensation or monetary exchanges that were part of the AAA Programme. Again this analysis drew on a combination of documentation and interview data. Network membership was restricted to the same population boundary as the sustainability network.

Personal relationships (Personal Network): These ties were considered present when evidence was found of existence of strong social and personal relationships among individuals across different organizations or between an individual in one organization and a different organization (for example a previous employer). This is in line with Krackhard's (1992) definition of 'philos' as a relationship based on interaction, affection and that has a history over an extended period of time. It is, however, an extension in that these can also refer to the feelings of an individual towards an organization, not just another individual. It is important to note that only 'positive' personal relationships were considered in the research. A possible limitation to the collection of this data is that the question on relationships was asked as an open-ended question, the personal type of relationships might not be complete. Unlike the AAA Sustainability Network or the Commercial Network,

there is no certainty that the research captured the entirety of relationships existing at any point in time. Again network membership was restricted to those actors who were present in the sustainability network.

Sociomatrices were constructed to represent the three types of linkages. Dyadic interactions were represented in three groups of dichotomous matrices: R (AAA Sustainability), C (Commercial) and P (Personal), each representing the existence or absence of a relationship among the 37 organizations at six points in time, one for each period between 2002 and 2007¹³. The relationships were all coded as non-directional and binary, representing the existence or not of a relationship but not including the direction of the relationship or its magnitude.

Symmetric matrices were then constructed, represented as sociomatrices:

$$\begin{aligned} R(t_m) &= (R_{ij}(t_m)) \\ C(t_m) &= (C_{ij}(t_m)) \\ P(t_m) &= (P_{ij}(t_m)) \end{aligned}$$

Where

$$\begin{aligned} M &= (m_1, \dots, m_6) = (2002, 2003, 2004, 2005, 2006, 2007) \\ I &= (i_1, \dots, i_{37}) = \text{actors and } J = (j_1, \dots, j_{37}) = \text{same set of actors} \\ \text{And } i &\neq j^{14} \end{aligned}$$

Actor attributes and affiliations

In addition to relational ties, actor attributes networks can contain measurements of the characteristics of the actors (Wasserman and Faust, 1994). Each organization was classified according to the nature of its business into roasters, producers/traders, non-governmental organizations and international development organizations. In addition, each unit was also classified in terms of their geographical/business scope as a local, national/regional or global organization.

Two 2-mode matrices were constructed to reflect actor attributes. These types of networks involve measurements on two different sets of actors or on a set of actors and set of events, attributes or affiliations (Wasserman and Faust, 1994).

The first 2-mode matrix **A** classified the actors according to mutually exclusive attributes (i.e. no actor could be classified in more than one category) to indicate the nature of the organization (N) and the geographic level of operation (G).

$$\mathbf{A} = A_{ing}$$

¹³ As the AAA Sustainability Network was established in 2003, the matrix for this relationship corresponding to 2002 is an empty set.

¹⁴ Pairs listing same actor twice (i=j) are called 'self-choices' (Wasserman and Faust, 1994) and were not considered in the analysis.

Where:

$I = (i_1, \dots, i_{37})$ = actors

$N = (n_1, \dots, n_5)$ = (roaster, trader/processor, non-governmental organization, consultant, international development agency)

$G = (g_1, g_2, g_3)$ = (local, national/regional, global)

In a separate network, the affiliations of all actors to what are considered the major sustainable sourcing schemes in the coffee industry were recorded. Based on industry literature (Ponte, 2004), six additional programmes – Starbucks CAFÉ practices, the Common Code for the Coffee Community and the certification programmes of Fairtrade, Rainforest Alliance, Organic and Utz certified – were selected. Public information was used to identify linkages between the organizations that participated in the AAA Sustainability Network and other initiatives at any point during 2003-07. As it was not part of the original research construct and only data for the end period could be identified through the project interviews and retrieved using public sources, the sustainability programme affiliation matrix was only constructed for the end period. Matrix S consisted of 6 columns representing each of the programmes and 37 rows to represent each of the actors.

Therefore:

$S = S_{ik}$

Where

$I = (i_1, \dots, i_{37})$ = actors

$K = (k_1, \dots, k_6)$ = (Starbucks CAFÉ practices, 4C, Rainforest Alliance, Fairtrade, Organic, Utz certified)

Ucinet 6.207 (Borgatti et al. 2002) was used to construct matrices representing multiple relationships in the Nespresso-centric network. These matrices were then analyzed for a series of network constructs. Appendix 6.10.2 includes screen-shots of the socio-matrices that were included in the analysis using the software program.

4.4.7 Data analysis

Structure analysis using Ucinet

The software package Ucinet was also used to analyze the network data. Although the software package has been traditionally used for analysis of static networks its functionality can easily be adapted to the study of network structure over time. Two examples of such analysis are provided by a study of the evolution in knowledge-diffusion networks (Spencer, 2003) and a research on the dynamics of entrepreneurial firms from start-up through to growth (Coviello, 2005).

The analysis included the overall network (encompassing all actors) and each individual organization's ego-net. Standard network constructs were explored in examining the

overall structure of each network: demographics (tie creation and deletion, size of network), cohesiveness, centralization and actor positions in the network and brokerage opportunities.

Identifying actors that are extensively involved in relationships with other actors can provide an indication of their prominence in the network (Wasserman and Faust, 1994). Central and prominent positions in a network are often associated with power and influence (Freeman, 1979). Freeman's degree of centrality was calculated by counting the number of adjacent (direct) links to an actor. Closeness centrality, which accounts for direct but also for indirect links for each actor, was also measured. Hierarchy and centralization describe patterns of stratification or inequality in the extent to which actors are involved in relations. Hierarchical structure refers to the extent to which a single actor is the direct or indirect object of relations in it (Brass and Burkhardt, 1992; Burt, 1982). This centrality can be associated with being the object of many relations (degree), being in the paths that connect others (betweenness) or in terms of having access to others who are connected (closeness), and has been identified as a potential source of power in a network (Nohria, 1992; Brass and Burkhardt, 1992).

The level of cohesion found in the network over time was estimated using the density of a graph, as recommended in the literature (Wasserman and Faust, 1994; Blau, 1977). Measures used for assessing cohesiveness included in the analysis were density, average distance and distance-based cohesion or 'compactness'. Density is defined as the ratio of actual to potential ties, while connectivity is the degree to which members of a network are linked together through direct or indirect ties (Burt, 1982). Average geodesic distance is the number of relations in the shortest possible walk from one actor to another. Compactness indicates the level of cohesion based on these geodesic distances, where values range from 0 to 1 and larger values indicate greater cohesiveness. Cohesive networks are characterized by high density, mutuality among group ties and a higher relative frequency of ties among group members than non-members (Wasserman and Faust, 1994). A higher level of cohesiveness can also be found within a subgroup of the whole network.

The network was also analyzed to identify cohesiveness at the sub-group level. Nodes that are more tightly linked among each other but isolated from others can indicate a level of cohesiveness within sub-groups of the total network. Cliques are defined as subsets of nodes, all of which are adjacent to each other but where there are no other nodes that are also adjacent to all the members of the clique (Wasserman and Faust, 1994). The network was analyzed to identify all cliques with a minimum of 3 members.

The software program Ucinet was also used to examine the position of each organization in their neighbourhood and identify brokerage opportunities for actors. An organization or individual can span a 'structural hole', i.e. a relationship of non-redundancy between two contacts where the hole is a buffer between two otherwise unrelated nodes. This provides the organization spanning the structure hole with brokerage opportunities (Burt, 1992). Organizations that find themselves in structural holes are believed to have

increased brokerage opportunities and can thus give advantages to actors in negotiating their relationships (Burt, 1992).

Multiplex Network analysis

After examining each of the three networks independently, the networks were also analyzed. Multiplexity, the extent to which two types of ties coincide over a population (Skvoretz and Agneessens, 2007), was first identified by mapping the relationships among organizations and noting the organizations that were linked directly by two simultaneous types of relationships (AAA Sustainability - Commercial, Commercial - Personal or AAA Sustainability - Personal) and the organizations that were linked by all three types of relationships. To identify possible correlations between the presence of a tie in one network and the current or future presence of a tie between the same two actors in either of the other two networks, the Pearson correlation procedure was used (Hanneman and Riddle, 2005).

'Bifocal' analysis – The use of additional qualitative data

The quantitative analysis was complemented by the use of qualitative data emerging from the interviews and analyzed using the software program NVivo, as detailed in Section 4.4.5.

The spreadsheet that summarized the findings in the data (an example can be found on Appendix 6.8.5) was analyzed to identify specific mentions to linkages between organizations by interviewees, the rationale for creating them, the nature of the relationship and their assessment on their value. Direct quotes were incorporated to this document in the relevant sections and referenced to the document that identifies each source.

4.5 Research setting – Nespresso's AAA Sustainable Quality Programme

4.5.1 Nestlé Nespresso

Nestlé Nespresso is an operating unit of Nestlé Group, one of the world's leading food, beverage, nutrition and wellness companies. The business is headquartered in Paudex, Switzerland, and focuses on premium single-portion coffee at the high-end of the market, with a patented coffee-capsule technology, associated machinery and coffee capsules. The business is based on sales of specialized machines through retailers and direct sales of the patented coffee capsules to consumers, each capsule retailing at about CHF 0.50¹⁵. Though the original concept was developed in the mid 80s, it was only in the late 90s that the business started showing signs of market success. Despite a slow start, after a rapid transformation, by 2003 sales represented CHF 445 million, up from CHF 127 million five years earlier. The growth rate continued over the following five years, and by 2007 the company had already reached CHF 1.7 billion in sales.

15 At the exchange rate of December 14, 2009, 1 CHF was equivalent to € 0.66 and GBP 0.60

4.5.2 The Coffee industry

The coffee industry with retail sales of 45 billion US dollars (Euromonitor Global Market Information Database, 2008) is also one of the most widely traded agricultural commodities in the world. Most of its consumption concentrates in developed economies, while production takes place in smallholder farms in more than 50 developing nations, with over 20 million families depending on this crop (Ponte, 2004). From 1962 to 1989 the industry was tightly regulated by a trade, quota-based International Coffee Agreement (ICA) subscribed by most producing and consuming countries that regulated the target price for 'green' coffee (beans that have been washed and dried but not yet roasted and have a green colour).

The ICA broke down in 1989 (Ponte, 2004; Muradian and Pelupessy, 2005) and shortly after an oversupply of coffee and the entry of low-cost new actors such as Vietnam led to prices falling to an all time low in the second half of 2001 (International Coffee Organization, 2007). For more information about the characteristics and recent history of the coffee industry see Ponte (2004), Muradian and Pelupessy (2005) and Giovannucci and Ponte (2005/6). This coffee crisis hit coffee producers, many of them subsistence farmers, especially hard and it was a call for action for activist organizations such as Oxfam and Equal Exchange, which organized campaigns to sensitize consumers and the media on the precarious conditions of coffee growers, questioning the sourcing practices of the large and powerful coffee buyers (Argenti, 2004; Oxfam America, 2002).

At the same time, while demand for average coffee was slowing down, consumer appetite for high quality coffees was on the rise and Nespresso's coffee capsules enjoyed great success, pressuring the supply chain operations to manage a continually rising demand for high quality green coffee.

4.5.3 Nespresso's AAA Sustainable Quality™ Programme

Sensitive to the difficult context conditions and concerned about the long-term supply of high quality coffee needed to support an aggressive growth strategy, Nespresso launched the 'Nespresso AAA Sustainable Quality™ Programme' in 2003. According to the firm, the programme represented an 'effort to secure the highest quality coffee while promoting environmental, social and economic sustainability along the entire value chain, from the farmer to the consumer' (Nestlé Nespresso 2008).

The programme was driven by Nespresso, but developed together with green coffee suppliers, Nestlé internal resources and Rainforest Alliance (RA), an agricultural production sustainability non-governmental organization. The programme elements included assessing the sustainability practices of farms and designing a 'continuous improvement' process, while at the same time providing a premium price to farmers for their coffee. During its inception and initial activities, the programme operated in two geographic clusters¹⁶ and involved two local NGOs (one RA local subsidiary and one NGO associated with RA through the Sustainable Agriculture Network) and two suppliers. The

¹⁶ Clusters are geographic regions where the conditions for Nespresso's required coffee quality exist. These clusters are identified and developed in partnership with a coffee supplier, who is granted exclusivity over the region for Nespresso purchases of green coffee.

programme expanded over time, and by the end of 2007 it was operating in 10 clusters in 5 different countries, involving 14 organizations and approximately 12,000 farmers.

Below Table 4-3 presents the organizations involved in Nespresso’s AAA Programme during the period 2003-07 and Table 4-4 lists the regional clusters where the programme operated.

Table 4-3: Organizations participating in Nespresso's AAA Programme 2003-07

Organization type	Organization	Description	Year joined
Roaster - Buyer	Nespresso	Subsidiary of Nestlé, roasts and packages coffee in patented system, sells directly to end consumer	2003
Coffee Traders (Buying green coffee in origin country and selling to roasters)	Expocafé	Colombian coffee exporter, owned by 36 cooperatives European sales office based in Switzerland	2003
	Ecom	Global coffee trader with operations in 20 countries, headquartered in Switzerland	2003
	National Coffee Federation of Colombia (FNC)	Colombian coffee exporter and not for profit institution supporting coffee farmers and farming communities European Sales office based in Belgium	2005
	Volcafé – ED&F	Global coffee trader with operations in 21 countries, headquartered in Switzerland	2006
	Neumann	Global coffee trader with operations in 28 countries, headquartered in Germany	2007
	Cooxupé	Brazilian coffee cooperative - Largest private coffee cooperative in the world. European sales through Efico, based in Belgium	2004
Non-Governmental Organizations (NGOs)	Rainforest Alliance	Pursues biodiversity conservation and sustainable livelihoods Has its own certification label but works also with company specific sustainability programs Acts as Secretariat of Sustainable Agriculture Network	2003
	Sustainable Agriculture Network	Local based biodiversity conservation NGOs in nine countries. Rainforest Alliance – Costa Rica Fundación Interamericana Investigación Tropical – Guatemala FundaNatura – Colombia Imaflores – Brazil	2003 2004 2004 2005
	Technoserve	Helps entrepreneurs in poor rural areas of the developing world to create economic growth.	2006
Consultant	GoodBrand	Provides support to corporations in developing corporate social strategy	2003
Multi-lateral development organization	International Finance Corporation	Member of the World Bank Group, providing investment and advisory services to build the private sector in developing countries.	2007

Table 4-4: Clusters participating in Nespresso's AAA Programme

Country	Trade Partner	Cluster	Year joined
Costa Rica	Ecom	La Giorgia	2003
		Orosi	2006
	Volcafé	Santo Domingo	2006
Colombia	Expocafé	Caldas	2004
	FNC Colombia	Nariño	2005
		Cauca	2005
	Neumann	Huila	2007
Guatemala	Ecom	Huehuetenango	2004
Mexico	Ecom	Ixhuatlán	2004
Brazil	Cooxupé	Cerrado	2004

4.6 Research findings

This section summarizes the findings of the research. The first sub-section analyzes the AAA Sustainable Quality Network and its structural characteristics over time, while the second sub-section addresses the multiplexity of relationships among organizations that were involved in the AAA Sustainable Quality (Sustainability) Network.

4.6.1 Nespresso AAA Sustainability Network

Programme evolution

The AAA Sustainability Network was created in 2003. In its first phase it involved Nespresso headquarters, two traders, a consultant company, the NGO Rainforest Alliance and two local NGOs associated with Rainforest Alliance through the ‘Sustainable Agriculture Network’. Some of these entities participated in the network through more than one organization. For example, the firm Ecom engaged in the programme both at the headquarters level and through the Costa Rica national operation. As such, two Ecom ‘organizations’ were included in the analysis as per the node definition described in Section 4.4.5.

Structure evolution

A visualization of the connections among the organizations participating in Nespresso’s AAA Programme was performed using graphical software Netdraw (Borgatti 2002).

Figure 4-3 displays the evolution of the overall network from 2003 to 2007. The organizations are colour coded in five categories according to the type of actor they represent: Nespresso/Nestlé, Exporters/Traders (supplying green coffee to Nespresso and buying it from farmers or cooperatives), Non-Governmental Organizations (NGOs), Consultants and International Development Organizations. These figures illustrate graphically the evolution of the network, its growth and the ties established among

and on the relative centralization position of specific organizations. As expressed by the programme manager who took over in 2005:

If you really want to do something big and solid you have to put some structure and you have to think about processes...If I want to do several projects with one supplier I can't have one-on-one conversations with each managing director... so we asked for some structure in place where we have someone overlooking the project from the suppliers global perspective (CE-NN-5).

The formalization of coordination also brought along some difficulties for some participants, having to shift from a very connected network to one that communicated through specific paths:

One thing that has changed lately is that now the communications are one-on-one and not the whole group as it used to be. When a topic was discussed we could all chip in, now you depend on them communicating with each other (CE-EX-2).

In addition to the coordinating roles of regional offices, Nespresso also proposed shifting some of the coordination communication by purposefully promoting communication and collaboration among technical or specific roles among the organizations. This was an important element of the reorganization occurring in 2005 and one that was appreciated by participants:

I think that Nespresso has been successful in identifying the people responsible in each organization for each topic and to allow a direct dialog to happen among these people across the organizations (CE-EX-4).

The programme continued expanding in 2006, with incorporation of 6 additional organizations and creation of 17 new ties. In 2007 a new structure change occurred when a new regional coordination office was set up in Colombia. As it had happened in 2005, a similar shift took place that re-oriented some of the coordination of activities to the newly created organization. During this year, 5 new organizations (including the regional office in Colombia) were incorporated into the network. There were also 26 new ties being created, but 6 were deleted or reoriented.

Ucinet 6 (Borgatti et al. 2002) was also used to calculate the level of cohesion found in the network over time. Strong levels of cohesion and short distances among actors have been identified as factors that facilitate information flows (Wasserman and Faust, 1994; Blau, 1977) and the density of a graph is a recommended measure of group cohesion by indicating the fraction of possible ties for the relation present in the network (Wasserman and Faust, 1994, p. 181). The results are also included in the Structure Analysis displayed in Table 4-5.

Table 4-5: Whole network structure analysis 2002-07 – AAA Sustainability Network

Area	Characteristic	2003	2004	2005	2006	2007
Demographics	Size	11	21	26	32	37
	Tie creation (deletion)	25 (0)	36 (0)	18 (13)	17 (0)	26 (6)
	Total number of ties	25	61	66	83	103
Density and Distance	Density of network	0.04	0.09	0.10	0.12	0.16
	Density of network, excl. isolates	0.45	0.29	0.20	0.17	0.16
	Average distance	1.60	1.88	2.10	2.20	2.23
	Distance-based cohesion 'compactness'	0.72	0.62	0.56	0.52	0.51

The density of the network – excluding isolated nodes – was moderately high in the first year, with almost half the possible ties present. However, it rapidly decreased from 2004 onwards and by 2007 only 16% of all possible ties were present, implying a progressively sparser or non-redundant network. There was also a trend of increasing average geodesic distance among connected actors, i.e. the number of relations in the shortest possible walk from one actor to another (Hanneman and Riddle, 2005), which augmented from 1.60 in 2003 to 2.23 in 2007. The distance-based cohesion measures follow the same trend as the density measurements, but decreasing more moderately from 0.72 (of a maximum of 1) in 2003 to 0.51 in 2007.

This evolution in the level of cohesiveness or density of the network was also reflected in the views of the actors captured through the research interviews. During the first phases of the Programme there was a general feeling of strong interconnectedness among all the actors. This was a phase marked by constant communication, as the Programme was being defined and initial projects being implemented. As expressed by a Nespresso executive:

In the beginning, around the negotiating table there were phone, e-mails and videoconferences. Everyone was there. The traders, their agronomists, the NGO, Nespresso managers, quality experts, etc. In the beginning it was just that, then it got bigger and bigger (CE-NN-1).

As the Programme evolved, however, the stress of an expanding network was felt as having impacted the quality of communication and the ability to stay connected to all the actors in the network. In the words of a trader that had been part of the network since the beginning:

We went through some growth pains. In the beginning, when it was just Costa Rica and Colombia, it was easy to communicate, we knew each other from the beginning, and it was easy. But after a while we had different partners, people in three continents, multiple organizations and operating styles, this can create some growth stress (LO-EX-11).

Cliques and subgroups

The network was also analyzed to identify cohesiveness at the sub-group level. Nodes that are more tightly linked among each other but isolated from others can indicate a level of cohesiveness within sub-groups of the total network. The network was analyzed to identify all cliques with a minimum of 3 members. Table 4-6 illustrates the number of cliques and their relative size for each period, and the number of nodes that were involved in at least one clique.

Overall, even though the total density of the network is relatively low, it contained a high number of cliques, with 7 occurrences in 2003 growing to 27 by 2007. Most of the organizations belonged to at least one clique and at least one of the cliques in each period included 5 or more organizations. Appendix 6.10.4 details the composition of each clique. The largest cliques were found among the NGO members of the Sustainable Agriculture Network which, as mentioned before, were organized as a network of directly connected organizations. The local implementation of the programme also involved cliques, including the NGO representative, the national exporting organization and the local trader representative.

Table 4-6: Cliques of 3 or more nodes in the AAA Sustainability Network

	2003	2004	2005	2006	2007
Number of cliques	7	16	19	24	27
Number of nodes in each clique	5 (2 cliques) 4 (2 cliques) 3 (3 cliques)	7 (1 clique) 5 (1 clique) 4 (5 cliques) 3 (9 cliques)	6 (1 clique) 4 (7 cliques) 3 (11 cliques)	6 (1 clique) 4 (10 cliques) 3 (13 cliques)	6 (1 clique) 5 (1 clique) 4 (14 cliques) 3 (11 cliques)
Nodes belonging to at least one clique	10	20	25	31	33
Total nodes	11	21	26	32	37

Network centrality

The network was also analyzed to identify the overall level of centralization and the relative position of actors. Identifying actors that are extensively involved in relationships with other actors can provide an indication of their prominence in the network (Wasserman and Faust, 1994). Central and prominent positions in a network are often associated with power and influence (Freeman, 1979).

Table 4-7 displays the centralization of the AAA Sustainability Network measured by Freeman's degree of centrality and closeness centrality. It also lists the nodes that were found to be more central for each of the two measures.

Table 4-7: Centralization of the AAA Sustainability Network

	2003	2004	2005	2006	2007
Degree (Freeman)	54.4%	50.8%	34.3%	37.2%	27.7%
Top nodes (share %)	Nespresso HQ (18%) Rainf. All. HQ (14%) Ecom CTCA (12%) GoodBrand (10%) Rainf. All CTCA (10%)	Nespresso HQ (12%) Rainf. All. HQ (8%) Ecom CTCA (7%) FIIT GALA (7%) FundaNat COLB (7%) ProNatura MEXI (7%)	Nespresso HQ (10%) FundaNat COLB (8%) Nespresso CTCA (8%) FIIT GALA (6%) ProNatura MEXI (6%) Rainf. All CTCA (6%)	Nespresso HQ (10%) Nespresso CTCA (8%) FundaNat COLB (7%) Rainf. All. CTCA (7%) FIIT GALA (5%) ProNatura Mexi (5%)	Nespresso COLB (7%) Nespresso CTCA (7%) FundaNat COLB (6%) Nespresso HQ (6%) Rainf. All. CTCA (5%)
Closeness centrality	61.3%	54.2%	40.2%	44.0%	36.8%
Top 5 nodes	Nespresso HQ Rainf. All. HQ Ecom CTCA GoodBrand Rainf. All CTCA	Nespresso HQ Rainf. All. HQ FIIT GALA FundaNat COLB ProNatura MEXI	Nespresso HQ FundaNat COLB Imaflora BRA Rainf. All. HQ Nespresso CTCA	Nespresso HQ FundaNat COLB Nespresso CTCA Imaflora BRA Rainf. All. HQ	Nespresso COLB Nespresso CTCA Nespresso HQ FundaNat COLB Rainf. All. HQ

Freeman's degree of centrality showed a decrease in overall centralization in the network that went from 54.4% in 2003 to roughly half that figure, to 27.7%, in 2007. Closeness centrality also decreased over time, from 61.3% in the initial period to 36.8% in 2007.

Though the network shows a distinct trend towards decentralization, central positions in the network were consistently occupied by Nespresso organizations. Nespresso headquarters accounted for 18% of Freeman's network centralization degree in 2003. By 2007, in a less centralized network, Nespresso headquarters only accounted for 6% of overall network centralization, but the two regional Nespresso organizations (created in 2005 and 2007, respectively) account for an additional 14% of overall centralization of the total network.

As this is a network that was created specifically to coordinate Nespresso's AAA Sustainable Quality Programme it is not surprising that Nespresso, as the formal leader of the network, occupies a central position in the coordination and formal communication network. Perhaps more revealing is the group of organizations that occupy the next most central roles after Nespresso. The NGO organizations (Rainforest Alliance, FundaNatura, FIIT, ProNatura Mexico) consistently occupy central positions in the network. These organizations all belong to the Sustainable Agriculture Network, sharing a parallel form of coordination and communication among each other, which allows information to flow more rapidly among them, and places them, especially the ones that interact with most local operations, in a central position.

4.6.2 Structural holes: Brokerage opportunities and constraints

The software program Ucinet was also used to examine the position of each organization in their neighbourhood and identify brokerage opportunities for actors. Organizations that find themselves in structural holes, bridging relationships of non-redundancy between two contacts (Burt, 1992), are believed to have increased brokerage

opportunities and can give advantages to actors in negotiating their relationships (Burt, 1992).

The evolution of the effective size of each ego-network was measured. This meant measuring the number of alters that each ego had at each point in time (degree) and subtracting the average number of ties that each alter had to other alters (Hanneman and Riddle, 2005). This measure can serve as an indicator of the potential span of influence of a certain node. As in the centralization measures, the larger effective size networks corresponded to the Nespresso organizations (headquarters and regional subsidiaries) and to the NGOs located in the areas with the largest number of projects or clusters (Rainforest Alliance Costa Rica and FundaNatura in Colombia). Table 4-8 summarizes the Ego Net measures for effective size, constraints and normalized brokerage measure for all actors.

Table 4-8 - AAA Sustainability Network Ego Nets

	AAA Network - Ego Net measures by stage for all actors														
	Degree					Constraint					Normalized Brokerage				
	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
Goodbrand	5.0	7.0	2.0	3.0	4.0	0.63	0.46	1.13	0.84	0.68	0.10	0.24		0.17	0.25
Technoserve COLB				4.0	6.0				0.58	0.46				0.25	0.23
Technoserve HQ				3.0	3.0				0.61	0.61				0.33	0.33
IFC					4.0					0.64					0.25
FIIT GALA		8.0	8.0	8.0	8.0		0.40	0.40	0.40	0.40		0.20	0.23	0.23	0.23
FundaNatura COLB	4.0	8.0	11.0	11.0	13.0	0.70	0.40	0.27	0.27	0.26	0.17	0.20	0.35	0.35	0.35
Imafiora BRA		7.0	7.0	7.0	7.0		0.47	0.45	0.45	0.44		0.12	0.19	0.19	0.21
Pro Natura Sud MEXI		8.0	8.0	8.0	8.0		0.39	0.40	0.40	0.40		0.21	0.23	0.23	0.23
Rainforest Alliance CTCA	5.0	8.0	8.0	11.0	11.0	0.58	0.41	0.40	0.30	0.30	0.20	0.18	0.23	0.32	0.32
Rainforest Alliance HQ	7.0	10.0	7.0	7.0	7.0	0.46	0.34	0.45	0.45	0.42	0.21	0.23	0.19	0.19	0.24
Nespresso HQ	9.0	15.0	13.0	16.0	13.0	0.33	0.21	0.18	0.15	0.17	0.31	0.34	0.44	0.45	0.46
Nestle HQ	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00	1.00	1.00					
Nespresso CTCA			10.0	13.0	14.0			0.29	0.25	0.22			0.33	0.37	0.38
Nespresso COLB					15.0					0.21					0.39
Cooxupe Cerrado BRA		4.0	3.0	3.0	3.0		0.70	0.84	0.84	0.61		0.17	0.17	0.17	0.33
Ecom CTCA	6.0	8.0	6.0	7.0	8.0	0.51	0.39	0.50	0.44	0.38	0.20	0.27	0.23	0.26	0.30
Ecom GALA		6.0	6.0	6.0	6.0		0.48	0.50	0.50	0.50		0.27	0.23	0.23	0.23
Ecom HQ	4.0	6.0	4.0	4.0	5.0	0.77	0.53	0.58	0.58	0.55		0.17	0.25	0.25	0.25
Ecom GALA Hue		2.0	3.0	3.0	3.0		1.13	0.93	0.93	0.93					
Ecom MEXI lxx		2.0	3.0	3.0	3.0		1.13	0.93	0.93	0.93					
Ecom CTCA Lgi	2.0	2.0	3.0	3.0	3.0	1.13	1.13	0.93	0.93	0.93					
Ecom MEXI		5.0	6.0	6.0	6.0		0.51	0.50	0.50	0.50		0.30	0.23	0.23	0.23
Ecom CTCA Oro				3.0	3.0				0.93	0.93					
Efico		3.0	2.0	2.0	2.0		0.93	1.13	1.13	0.50					0.50
Expocafé COLB Cal		3.0	3.0	4.0	6.0		0.84	0.84	0.70	0.54		0.17	0.17	0.17	0.13
Expocafé COLB	3.0	4.0	4.0	5.0	5.0	0.84	0.69	0.69	0.58	0.63	0.17	0.17	0.17	0.20	0.10
Expocafé-Cafexport	4.0	5.0	3.0	4.0	5.0	0.70	0.55	0.84	0.70	0.61	0.17	0.25	0.17	0.17	0.15
FNC COLB Cau			2.0	2.0	3.0			1.13	1.13	0.93					
FNC COLB			5.0	5.0	7.0			0.54	0.54	0.46			0.30	0.30	0.26
FNC EUR			2.0	2.0	3.0			1.13	1.13	0.84					0.17
FNC COLB Nar			2.0	2.0	3.0			1.13	1.13	0.93					
Neumann KG COLB					4.0					0.58					0.25
Neumann KG HQ					2.0					0.50					0.50
Neumann KG COLB Hui					3.0					0.93					
Volcafé CTCA				5.0	4.0				0.55	0.58				0.25	0.25
Volcafé HQ				2.0	2.0				1.13	0.50					0.50
Volcafé CTCA Sdo				3.0	3.0				0.93	0.93					

Constraints, a summary indicator that measures the extent to which an ego's connections are to others who are connected to one another (Hanneman and Riddle, 2005; Burt, 1992), was also calculated for each actor and for each of the periods analyzed. As it is also visible from the graphic representation in Figure 4-3 the most constrained actors are to be found on the 'edges' of the network, i.e. the local operations

or clusters which are connected to the rest of the network only through the trader and the local NGO representatives. Nestlé's headquarter operations was also on the edge of the network during the entire period as it was only connected to the network through Nespresso's headquarters and didn't participate in the regional or local activities of the programme.

Brokerage opportunities are identified finding the instances where an actor lies on the direct path between two others (Hanneman and Riddle, 2005). Though the brokerage measures for actors remain consistent over the duration of the programme, the structuring of formal coordination through the regional offices created a brokerage opportunity for trader headquarter operations that didn't exist when coordination of the regional national trader offices happened directly with Nespresso's headquarters.

4.6.3 Multiplex relations – Commercial and Personal Networks

Most organizations participating in Nespresso's AAA Sustainable Quality Network were linked to other network members in other ways beyond the linkages established by the programme. Three types of embedded relationships were analyzed as part of the study: commercial relationships (independent of any resource transfer within the scope of the AAA Programme), personal relationships among individuals belonging to the organizations or between an individual and an institution, and affiliation to any of the main sustainability sourcing schemes that existed at the time.

4.6.4 Commercial Network

Commercial ties

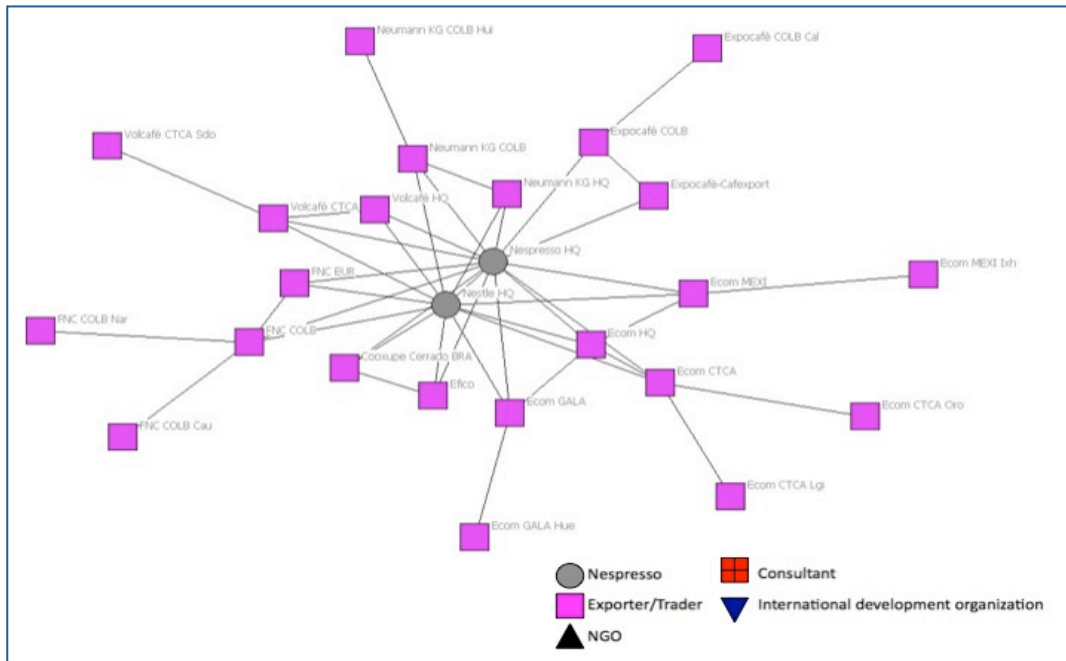
The commercial ties among participants in the AAA Sustainability Network were analyzed as part of the research. As in the AAA Sustainability Network, the Commercial Network only contained information on the existence or not of a commercial relationship but did not include the direction or the magnitude of these relationships. The matrices corresponding to the relationships present each year are included in Appendix 6.10. The traders participating in the programme and Nespresso and Nestlé, the main roasters involved in the network, represented the main commercial relationships among the participants in the AAA Sustainability Network. In addition, commercial relationships that represented the relationships between commercial organizations and their subsidiary operations were included. Also, in the beginning of the period under analysis, a service commercial relationship existed between the consultant company GoodBrand and Nespresso.

Graphical software Netdraw was used to visualize the connections among the organizations, displaying the initial existence of commercial ties, their evolution and their final state during the period 2004-07, represented in Figure 4-5.

Evolution of the Commercial Network

Overall, 26 out of the 37 organizations participating in the AAA Sustainability Network had at least one commercial type of relationship with another organization prior to the

Commercial Network 2004-2007



Structure characteristics of the Commercial Network

The Commercial Network was more stable than the AAA Sustainability Network, with very limited creation or deletion of ties during the period analyzed.

As displayed in Table 4-9, 26 (and later 25) of the 37 nodes had at least one commercial connection to another node. These connections were mostly ‘radial’ in nature, i.e. centralized around Nestlé Nespresso and Nestlé headquarters, the two major buyers participating in the AAA Sustainability Network. The Commercial Network exhibits a low level of density, with only 13% of the possible ties present in 2002 and increasing slightly to 15% by 2007. The average distance among connected organizations was 2.50 in the beginning of the period analyzed and moderately lower, at 2.44, by the end of the period.

Table 4-9 - Structure characteristics of the Commercial Network

Area	Characteristic	->2002	2003	2004-07
Demographics	Size	26	26	25
	Tie creation (deletion)	43 (0)	2 (0)	0 (1)
	Total number of ties	43	45	44
Density and Distance	Density of network	0.06	0.07	0.07
	Density of network, excl. isolates	0.13	0.14	0.15
	Average distance	2.50	2.43	2.44
	Distance-based cohesion ‘compactness’	0.47	0.48	0.48

The analysis of cohesion at the subgroup level indicated that 16 out of the 26 nodes (and 25 after 2004) participating in the Commercial Network belonged to at least 1 clique and the number of cliques remained constant throughout the period. These cliques were generally smaller than the ones found in the AAA Sustainability Network, containing either 3 or 4 nodes each, along the lines of each supply chain. Appendix 6.10.4 details the membership of each of these cliques.

Table 4-10 - Cliques of 3 or more nodes present in the Commercial Network

	-> 2002	2003	2004-07
Number of cliques	8	8	8
Number of nodes in each clique	4 (6 cliques) 3 (2 cliques)	4 (7 cliques) 3 (1 cliques)	4 (7 cliques) 3 (1 clique)
Nodes belonging to at least one clique	16	16	16
Total nodes	26	26	25

As it is already visible in the graph format (Figure 4-5), the Commercial Network is highly centralized around Nestlé and Nespresso. Table 4-11 shows a Freeman centralization degree of 52.0% and a closeness centralization degree of 63.2% for the period 2004-07. An important difference between this network and the AAA Sustainability Network is the position that Nestlé, as the headquarter organization and one of the largest buyers of green coffee, occupies in the network. The regional organizations of Nespresso that played a very central role in the AAA Sustainability Network are considered isolate organizations in the Commercial Network, as they didn't have a commercial function. The traders that were connected to the largest number of local clusters are the next most central actors, but accounting for 5-6% of total centralization, compared to 15-17% for Nespresso and Nestlé. It is important to note that, by design, the actors included in this network were only the actors involved in the AAA Sustainability Network and did not represent the full Commercial Network that Nespresso or Nestlé operated at the time.

Table 4-11: Centrality of the Commercial Network

	-> 2002	2003	2004-07
Degree (Freeman)	46.3%	54.3%	52.0%
Top 5 nodes	Nespresso HQ (16%) Nestlé HQ (15%) Ecom HQ (6%) Ecom CTCA (6%) Ecom GALA (5%)	Nespresso HQ (18%) Nestlé HQ (14%) Ecom HQ (6%) Ecom CTCA (6%) FNC COLB (6%)	Nespresso HQ (17%) Nestlé HQ (15%) Ecom HQ (6%) Ecom CTCA (6%) FNC COLB (6%)
Closeness centrality	50.6%	64.5%	63.2%
Top 5 nodes	Nespresso HQ Nestlé HQ Ecom HQ Ecom CTCA Ecom GALA	Nespresso HQ Nestlé HQ Ecom HQ Ecom CTCA FNC COLB	Nespresso HQ Nestlé HQ Ecom HQ Ecom CTCA FNC COLB

4.6.5 Personal Relationships Network

A matrix corresponding to the existence of (positive) personal relationships among one or more individuals or between an individual and an organization participating in the AAA Sustainability Network was constructed for each year of the duration of the programme, as well as for 2002, the year before the AAA Programme was initiated. As in the previous analysis, this network only contained information on the existence or not of a personal relationship but did not include the direction, the magnitude or the number of individuals in each organization involved in these relationships. The matrices analyzed are included in Appendix 6.10.

Personal relationships in the network were of varied nature. Of the 17 nodes participating in the AAA Sustainability Network, 14 made a reference to 'internal' networks of personal relationships that had been built over the years as people in the different units of the organization had worked together for long periods of time. There had also been long-standing working relationships across organizations that had supported development of personal relationships, for example between a local trader and its European representative, or among leaders of the NGOs belonging to the Sustainable Agriculture Network. Another type of relationship was found among people that had shared work, professional or personal relationships during their time working in a different organization. This was the case of the close relationship that existed between the lead consultant of GoodBrand and Nespresso's CEO. In his own words:

I have to say I was also very influenced by D... we had worked together for many years before and we had had a chance to have multiple discussions about many of these things over the years (CE-NN-2)

Similarly, a group of people that at the time of the research worked in Nespresso, in the National Coffee Federation of Colombia (FNC) and in Expocafé had all worked previously in FNC, and some of them had also worked at two of the three organizations. This group interacted informally with each other and had positive feelings or attachments to the organizations they had worked at previously.

I think it obviously helped that they had been associated with FNC in the past. They know what our institution is all about and when you need to explain to a high level executive, they can explain in very good detail, they know what we are capable of achieving (LO-EX-22).

The research didn't explicitly measure networks at the farm level. Still, personal relationships at this level were found to be particularly strong and influence commercial relationships, as well as the predisposition of farmers to become involved in Nespresso's AAA Programme.

I am loyal to the company, the manager is like a brother to me, we are friends, and they have always treated me very well. I always sell my coffee to them (LO-FA-12).

The relationship of this trader with small producers in the region is very special. I call it a

‘skin-to-skin’ type of relationship. They have offices in many farming areas, supply fertilizers, offer credit, etc., etc. (CE-ML-1).

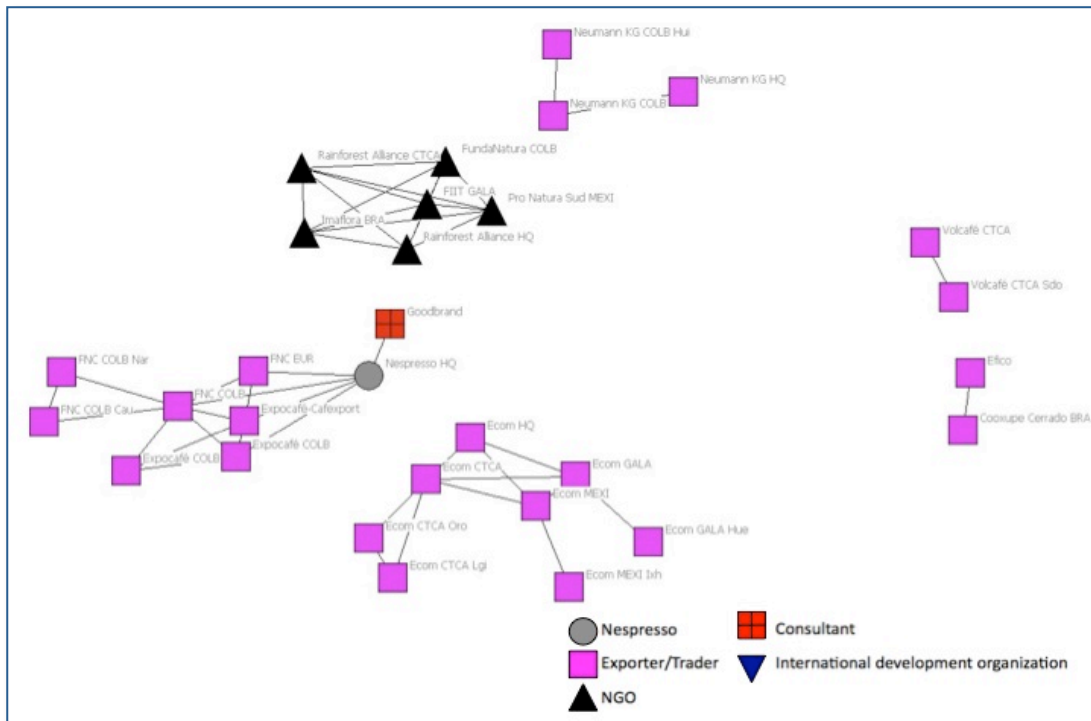
Evolution of the Personal Network

Though most of these relationships predated the creation and development of the AAA Sustainability Network, a few new relationships were developed after creation of the AAA Programme, at least partly as a consequence of relationships established for the activities of the AAA Programme. Such was the case of the linkage that was created when two employees from the local Colombian NGO FundaNatura were hired by Nespresso and by trader Neumann KG COLB respectively to coordinate the activities within the AAA Programme in Colombia. During the interviews, the personal relationships were also mentioned as evolving as a result of the activities carried out in the AAA Programme (LO-NN-12, LO-NN-13, LO-EX-13).

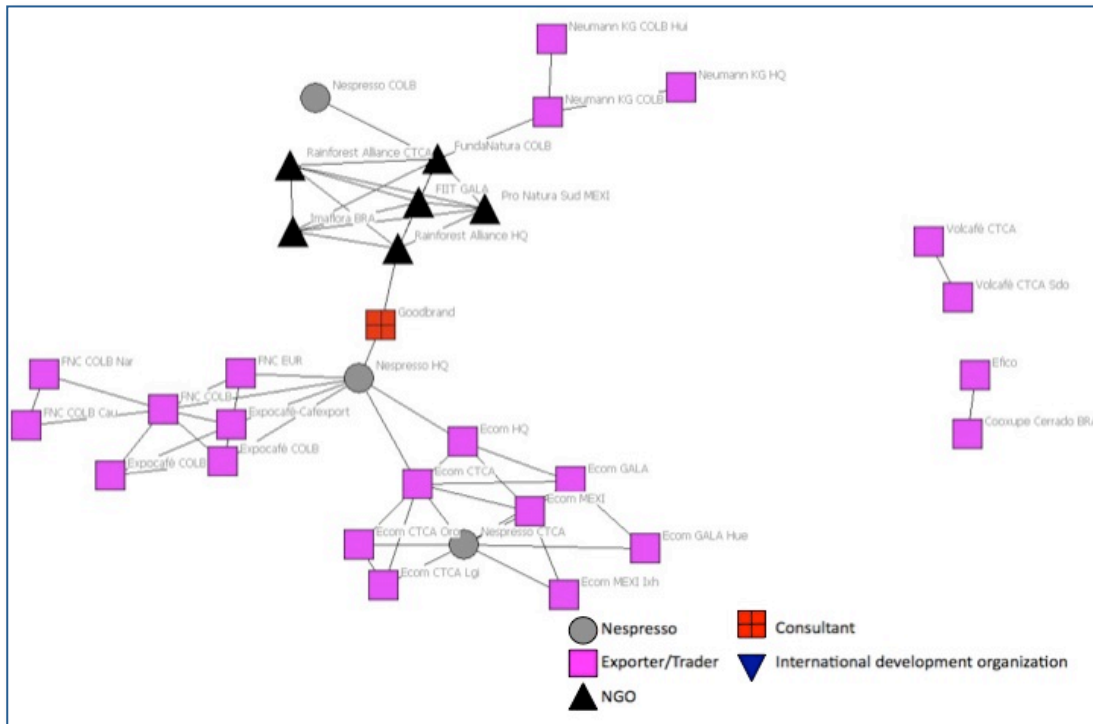
Graphical software Netdraw was again used to visualize the connections among the organizations, displaying the initial existence of personal ties, the evolution of these ties and the final state of the Personal Network in 2007. Figure 4-6 shows the Personal network structure in the beginning of the AAA Programme in 2002-03 and the changes in structure between this date and 2007. During 2004, 2005 and 2006 the network showed few changes, detailed in the matrix information in Appendix 6.10.

Figure 4-6: Personal ties among participants in the AAA Sustainability Network

Personal network 2002-03



Personal network 2007



Structure characteristics of the Personal Network

In total, 30 of the 37 organizations participating in the AAA Sustainability Network had at least one personal type of relationship with another organization and a total of 46 network ties had been established by 2002. As in the case of the Commercial Network, the personal relationship network evolved at a much slower pace during the period 2002-07 than the newly created Sustainability Network. No new ties were established in 2003, and only 12 ties were established between 2004 and 2007.

Table 4 -12 presents the demographic measures of the Personal Network. The density of the network is considerably lower than the AAA Sustainability Network, with only 12% of the total ties being realized in 2007 (compared to 16% for the AAA Network and 15% for the Commercial Network). The distance-based cohesion-compactness measure was also lower in the Personal Network, with a measure of 31% in 2007 (compared to 51% for the AAA Network and 48% for the Commercial Network). The graphical representation of the network in Figure 4-6 indeed shows a sparser network with fewer connections among sub-groups of organizations than in the other two networks.

Table 4-12 - Structure characteristics of the Personal Network

Area	Characteristic	->2002-03	2004	2005	2006	2007
Demographics	Size	30	30	30	31	32
	Tie creation (deletion)	46 (0)	2 (0)	1(0)	6 (0)	3 (0)
	Total number of ties	46	48	49	55	58
Density and Distance	Density of network	0.07	0.07	0.07	0.08	0.09
	Density of network, excl. isolates	0.11	0.11	0.11	0.12	0.12
	Average distance (among reachable pairs)	1.55	2.32	3.11	3.08	3.58
	Distance-based cohesion 'compactness'	0.15	0.20	0.26	0.27	0.31

The structure of the Personal Network contained an important number of cliques. In 2002-03, in addition to the Sustainable Agriculture Network clique, there are four 'Colombian' cliques that include 3 or 4 nodes each (with many of the members overlapping across cliques). There are also two cliques that include one of the traders running several clusters in Central American. As Table 4-13 shows, there were 7 cliques present in the beginning of the period. Of these, 6 contained 3 or 4 nodes, while the remaining clique contained all the members of the Sustainable Agriculture Network. The number of cliques increased to 11 by 2007, most of them still containing 3 or 4 nodes as members of each clique. Appendix 6.10.4 details the composition of each clique, which can also be visually noted in the graphical representation of the network in Figure 4-6.

Table 4-13 - Cliques of 3 or more nodes present in the Personal Network

	2002-03	2004	2005	2006	2007
Number of cliques	7	8	8	12	11
Number of nodes in each clique	6 (1 clique) 4 (4 cliques) 3 (2 cliques)	6 (1 clique) 4 (4 cliques) 3 (3 cliques)	6 (1 clique) 4 (4 cliques) 3 (3 cliques)	6 (1 clique) 4 (5 cliques) 3 (6 cliques)	6 (1 clique) 4 (6 cliques) 3 (4 cliques)
Nodes belonging to at least one clique	20	20	20	21	23
Total nodes	30	30	30	31	32

By 2007, the 4 'Colombian' cliques and the NGO clique were still present. In addition, Nespresso became a part of the cliques involving the trader in Central America, resulting in an increase to 6 cliques in the region.

The Personal Network displayed a low level of centralization as Table 4 -14 shows. Freeman's degree for the network ranged between a high of 14.5% in 2002-03 to a low of 11.6% in 2007. Closeness centrality for the entire network cannot be measured as the network is not connected as a whole but the organizations that occupied the most

central positions based on the Freeman degree or on closeness centrality were the same ones. Some of the central positions in the beginning of the programme differ from the central roles found in the AAA Network and the Commercial Network. For example, FNC Colombia (which was not part of the AAA Network in 2003) already occupied a central position in the Personal Network as a centre of the ‘Colombian’ clique. GoodBrand also occupied a central role in the Personal Network from 2005 onwards. The privileged relationship the lead consultant enjoyed with the NGO placed him in a strong position that could offer brokerage opportunities (see also Appendix 6.10.5 for complete ego-nets and brokerage opportunities). Thus, the trust he had developed in working with Rainforest Alliance allowed him to serve not only as an advisor but also as an informal bridge between Nespresso and the NGO. In his words:

The most important thing during the whole of that period was to win the trust and respect of the NGO (CE-CN-1).

Table 4-14: Centrality in the Personal Network

	-> 2002 - 03	2004	2005	2006	2007
Degree (Freeman) excl. isolates	14.5%	14.0%	13.8%	12.3%	11.6%
Top nodes	FNC COLB NGO network	Nespresso HQ FNC COLB Ecom CTCA NGO network Expocafé-Cafexp.	Nespresso HQ FNC COLB Ecom CTCA NGO network Expocafé-Cafexp.	Nespresso HQ FNC COLB Ecom CTCA Nespresso CTCA NGO network	Nespresso CTCA Ecom CTCA FundaNatura COLB Nespresso HQ FNC COLB
Closeness centrality	n.a.	n.a.	n.a.	n.a.	n.a.
Top 5 nodes	FNC COLB Nespresso HQ Expocafé- Cafexport Expocafé-COLB FNC EUR	Nespresso HQ Ecom CTCA Ecom HQ FNC COLB Expocafé-Cafexp. FNC EUR	Nespresso HQ Ecom CTCA GoodBrand Ecom HQ FNC COLB Expocafé-Cafexp.	Nespresso HQ Ecom CTCA GoodBrand Ecom HQ FNC COLB Expocafé- Cafexp.	Nespresso HQ GoodBrand Ecom CTCA Rainf. All HQ Ecom HQ FNC COLB

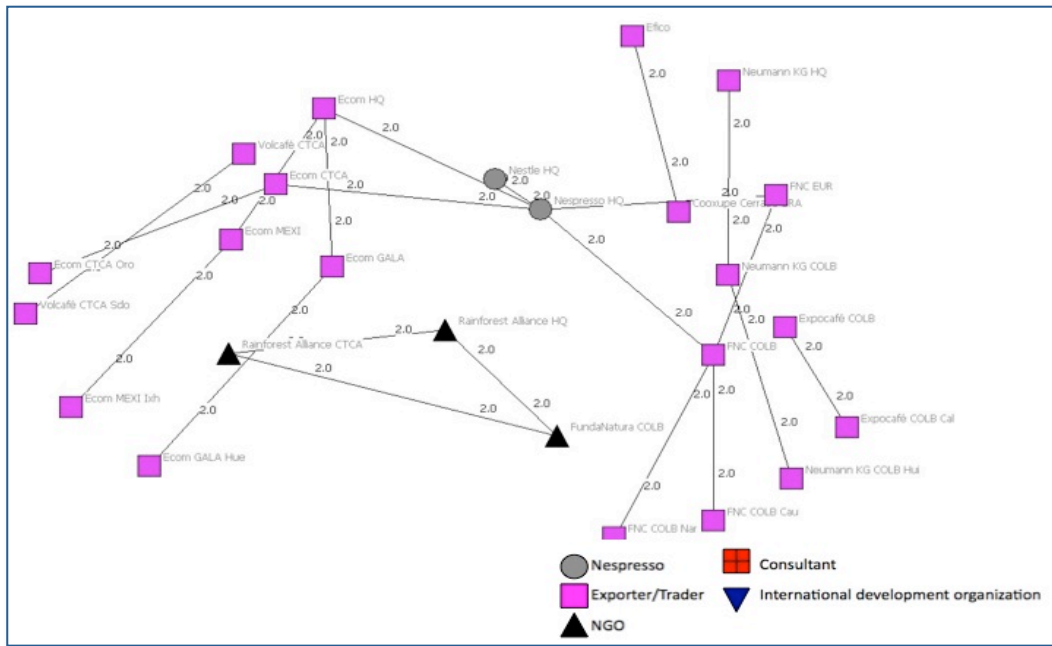
4.6.6 Multiplex relations

After the three networks had been examined independently, they were also analyzed together seeking to identify the overlaps across the different networks and identify possible correlations across networks and over time. Multiplexity denotes overlap or redundancy in relations (Minor, 1983). It was first identified by mapping the relationships among organizations and by noting the organizations that were linked directly (adjacent) by two simultaneous types of relationships (AAA Sustainability-Commercial, Commercial-Personal or AAA Sustainability-Personal) and the organizations that were linked by all three types of relationships. Figure 4-6 and Figure 4-7 display multiplex linkages among participating organizations in 2003 and in 2007.

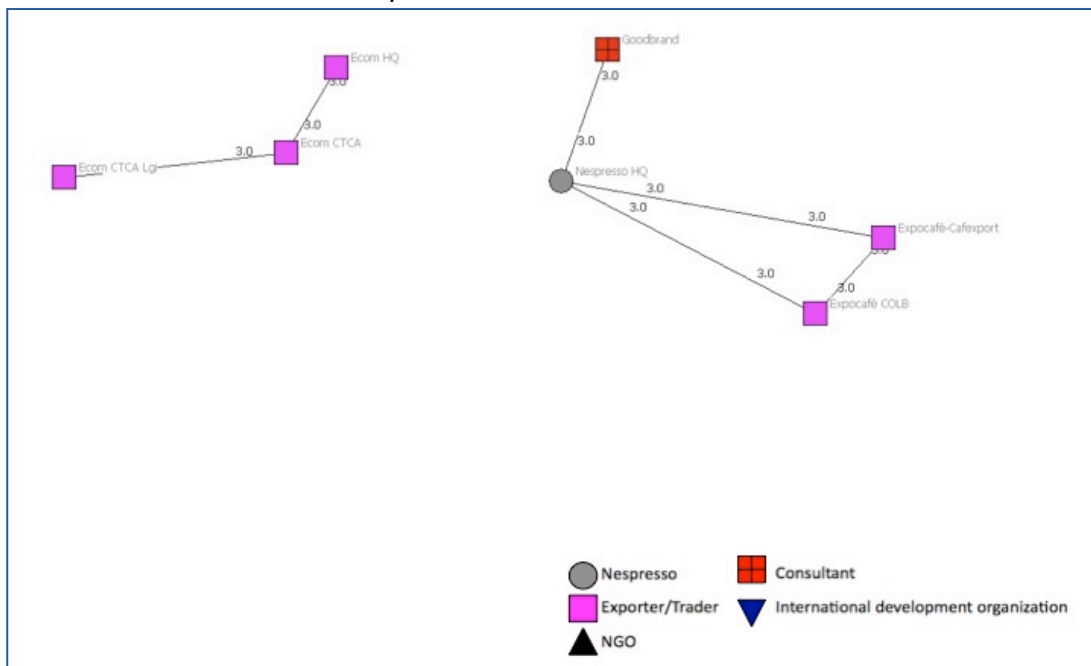
In 2003, 28 of the 37 organizations maintained at least two types of simultaneous direct linkages with another organization that already participated in the AAA Sustainability Network or would participate in it at some point during the period under study. Further, simultaneous commercial, AAA Sustainability Network and personal ties linked 7 of these organizations that year. By 2007, 34 organizations shared 2 types of direct linkages, and triple ties linked 23 of these organizations.

Figure 4-7: Multiplex relationships in 2003

At least two simultaneous relationships



Three simultaneous relationships



Particularly in reference to the linkages between the Commercial Network and the Sustainability Network, there was a feeling among participants that these connections were very relevant and would only become more so in the future:

The rapid increase in demand for highest quality specialty grade coffee and Nespresso's very specific profile requirements are prompting consideration of longer-term approaches to supply chain management (SR-1).

By 2010, 50% of the coffee will be sourced from clusters participating in the AAA Programme (JA-2).

We started working with Nespresso 5 years ago and, over time, we got to know the AAA Programme. We have been working towards being included in this programme because we believe the future business with Nespresso is definitely in this direction (LO-EX-27).

Network membership correlation

The multiplexity analysis using Pearson's procedure (presented in Section 4.4.7) results are displayed in Figure 4-9 and show that membership to a network during the analyzed period is strongly correlated to membership to the same network at any point in the future and that these values are significant at the 1% level. The correlations among membership to different networks also indicated a moderately positive relationship. Membership to the Commercial Network and the AAA Sustainability Network was positively correlated over time, with Pearson index ranging from 0.202 to 0.369. The lowest correlation was registered between participating in the AAA Network in 2003 and membership to the Commercial Network at any point during the period analyzed, while the highest level of 0.369 linked the existence of commercial relationships in 2003 with participation in the AAA Sustainability Network in 2006.

Membership to the Personal network had a stronger positive correlation with the AAA Sustainability Network, with Pearson coefficient ranging from 0.227 to 0.704. The lowest Pearson ratio values in this range are found in the correlation between personal relationships at any time and participation in the initial AAA Sustainability Network in 2003. However, personal relationships in 2002-03 are strongly correlated with participation in the AAA Sustainability Network after that period. One possible explanation of this is that the FNC, the Colombian coffee trader organization, played a central role in a personal clique but only joined the Commercial Network formally in 2004 and the Sustainability Network in 2005. Similarly, the Sustainable Agriculture Network, of which Rainforest Alliance exercised a Secretariat role, showed a high level of personal relationships among participating local NGOs. As these NGOs were integrated into the AAA Sustainability Network, this impacted the overall correlation between the Personal Network and the Sustainability Network. A final observation on this correlation is suggested by the positive correlation between participation in the programme in 2005 and 2006 and personal relationships in 2006 and 2007. Indeed, the interview data indicated that the intense communication and relationship building activities resulted in the emergence of new personal relationships among participants in the AAA Sustainability Network over time.

Figure 4-9: Pearson correlations and P-Values for multiplex relationships over time

Commercial-AAA Correlations

QAP Statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Relat	Relat	Relat	Relat	Relat	C2002	C2003	C2004	C2005	C2006	C2007	P2002	P2003	P2004	P2005	P2006	P2007
1 Relationships2003	1.000	0.622	0.384	0.352	0.243	0.237	0.230	0.202	0.202	0.202	0.202	0.227	0.227	0.216	0.307	0.285	0.275
2 Relationships2004	0.622	1.000	0.731	0.637	0.498	0.298	0.288	0.272	0.272	0.272	0.272	0.550	0.550	0.551	0.588	0.548	0.530
3 Relationships2005	0.384	0.731	1.000	0.879	0.706	0.301	0.321	0.316	0.316	0.316	0.316	0.623	0.623	0.595	0.638	0.704	0.682
4 Relationships2006	0.352	0.637	0.879	1.000	0.807	0.345	0.369	0.357	0.357	0.357	0.357	0.578	0.578	0.554	0.590	0.647	0.641
5 Relationships2007	0.243	0.498	0.706	0.807	1.000	0.293	0.298	0.287	0.287	0.287	0.287	0.522	0.522	0.518	0.532	0.561	0.604
6 C2002	0.237	0.298	0.301	0.345	0.293	1.000	0.976	0.963	0.963	0.963	0.963	0.963	0.963	0.963	0.963	0.963	0.963
7 C2003	0.230	0.288	0.321	0.369	0.298	0.976	1.000	0.988	0.988	0.988	0.988	0.988	0.988	0.988	0.988	0.988	0.988
8 C2004	0.202	0.272	0.316	0.357	0.287	0.963	0.988	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
9 C2005	0.202	0.272	0.316	0.357	0.287	0.963	0.988	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
10 C2006	0.202	0.272	0.316	0.357	0.287	0.963	0.988	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
11 C2007	0.202	0.272	0.316	0.357	0.287	0.963	0.988	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12 P2002	0.227	0.550	0.623	0.578	0.522	0.386	0.422	0.404	0.404	0.404	0.404	1.000	1.000	0.959	0.967	0.908	0.882
13 P2003	0.227	0.550	0.623	0.578	0.522	0.386	0.422	0.404	0.404	0.404	0.404	1.000	1.000	0.959	0.967	0.908	0.882
14 P2004	0.216	0.551	0.595	0.554	0.518	0.382	0.395	0.389	0.389	0.389	0.389	0.959	0.959	1.000	0.950	0.892	0.866
15 P2005	0.307	0.588	0.638	0.590	0.532	0.417	0.451	0.434	0.434	0.434	0.434	0.967	0.967	0.950	1.000	0.939	0.912
16 P2006	0.285	0.548	0.704	0.647	0.581	0.387	0.419	0.403	0.403	0.403	0.403	0.908	0.908	0.892	0.939	1.000	0.971
17 P2007	0.275	0.530	0.682	0.641	0.604	0.374	0.405	0.382	0.389	0.389	0.389	0.882	0.882	0.866	0.912	0.971	1.000

Personal-AAA Correlations Personal-Commercial Correlations

Relationship= AAA Network
C= Commercial
P= Personal

QAP P-Values

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Relat	Relat	Relat	Relat	Relat	C2002	C2003	C2004	C2005	C2006	C2007	P2002	P2003	P2004	P2005	P2006	P2007
Relationships2003	0.000	0.000	0.000	0.000	0.000	0.003	0.004	0.007	0.007	0.007	0.007	0.000	0.000	0.000	0.000	0.000	0.000
Relationships2004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Relationships2005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Relationships2006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Relationships2007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
C2002	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
C2003	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
C2004	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
C2005	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
C2006	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
C2007	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P2002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P2003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P2004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P2005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P2006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P2007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

4.6.7 Affiliation networks

In addition to the relationships that existed among the organizations that participated in the AAA Sustainability Network, all of the organizations were involved to some extent in other sustainability programmes. Data from the interviews suggested that these relationships had a very strong impact on the creation and evolution of the AAA Sustainability Network, acting as efficient conduits of information. This also offered

increased bargaining power for actors that could participate in more than one competing network.

To quantify the extent of multiple affiliations found among organizations participating in the AAA Sustainability Network, a two-mode matrix was built to identify joint participation in other sustainable sourcing initiatives existing at the time. Based on industry literature (Ponte, 2004) and the author’s research on this subject (Alvarez, 2010), six additional programmes considered as leading initiatives in sustainable sourcing in the industry were selected. Public information was used to identify linkages between the organizations that participated in the AAA Sustainability Network and other initiatives at any point during the period 2003-07.

Structure characteristics of the affiliation network

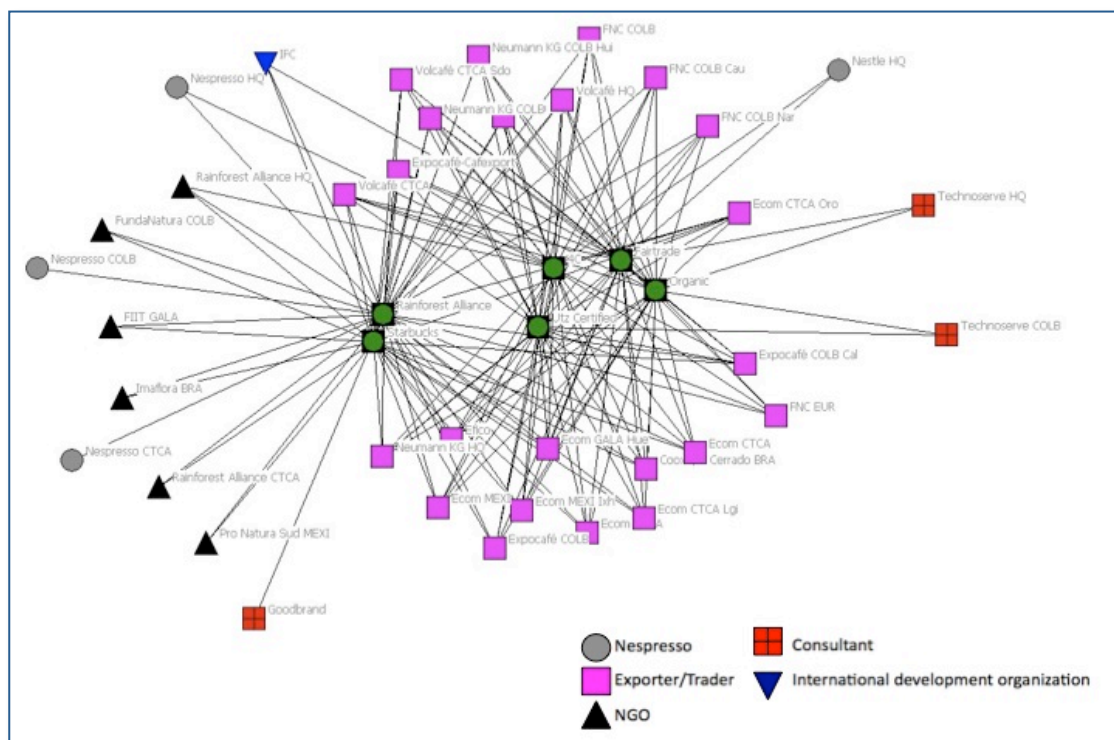
In order to identify the extent of cross-affiliations among organizations, the two-mode matrix was converted into a one-mode matrix using the cross-product method (Hanneman and Riddle, 2005). Figure 4-10 displays the result of the analysis, showing a high degree of cross-affiliation among programmes, especially with regard to the traders. The research showed that 19 out of the 37 organizations were linked to each other by joint affiliation to all 6 programmes, in addition to the Nespresso AAA initiative. A further 4 organizations were linked by joint affiliation to 5 of the 6 programmes.

Figure 4-10: Cross affiliations to sustainability programmes

Input dataset:		SustainabilitynoNespresso (C:\Documents and Settings\All Users\Documents\Ucti																																												
Dimension:		ROWS																																												
Method:		Cross-Products (co-occurrence)																																												
Normalization:		None																																												
		1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	3	3	3	3	3	3						
		G	T	T	I	F	F	I	P	R	R	N	N	N	C	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F	F	F	N	N	N	N	V	V	V					
1	Goodbrand	1	0	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
2	Technoserve COLB	0	2	1	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2				
3	Technoserve HQ	0	1	2	1	0	0	0	0	0	0	1	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2			
4	IFC	1	0	1	3	2	2	2	2	2	2	1	1	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3			
5	FIIT GALA	1	0	0	2	2	2	2	2	2	2	1	0	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2			
6	FundaNatura COLB	1	0	0	2	2	2	2	2	2	2	1	0	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2			
7	Imaflora BRA	1	0	0	2	2	2	2	2	2	2	1	0	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
8	Pro Natura Sud MEXI	1	0	0	2	2	2	2	2	2	2	1	0	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
9	Rainforest Alliance CTCA	1	0	0	2	2	2	2	2	2	2	1	0	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
10	Rainforest Alliance HQ	1	0	0	2	2	2	2	2	2	2	1	0	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
11	Nespresso HQ	1	0	0	1	1	1	1	1	1	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12	Nestle HQ	0	0	1	1	0	0	0	0	0	1	1	2	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
13	Nespresso CTCA	1	0	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
14	Nespresso COLB	1	0	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
15	Cooxupe Cerrado BRA	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
16	Ecom CTCA	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
17	Ecom GALA	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
18	Ecom HQ	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
19	Ecom GALA Hue	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
20	Ecom MEXI Ixh	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
21	Ecom CTCA Lgi	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
22	Ecom MEXI	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
23	Ecom CTCA Oro	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
24	Efico	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
25	Expocafé COLB Cal	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
26	Expocafé COLB	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
27	Expocafé-Cafexport	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
28	FNC COLB Cau	1	2	2	2	1	1	1	1	1	2	2	2	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
29	FNC COLB	1	2	2	2	1	1	1	1	1	2	2	2	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
30	FNC EUR	1	2	2	2	1	1	1	1	1	2	2	2	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
31	FNC COLB Nar	1	2	2	2	1	1	1	1	1	2	2	2	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
32	Neumann KG COLB	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
33	Neumann KG HQ	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
34	Neumann KG COLB Hui	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
35	Volcafé CTCA	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
36	Volcafé HQ	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
37	Volcafé CTCA sdo	1	2	2	3	2	2	2	2	2	3	2	2	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		

Graphical software Netdraw was again used to visualize the connections between the organizations and the initiatives, displayed in Figure 4-10. Multiple connections were identified between the organizations and multiple schemes and all 23 nodes representing the traders were affiliated to at least one other initiative by 2007.

Figure 4-11: Affiliation to major sustainability initiatives 2003-07



The change in the industry was perceived by some organizations as a fast and quite fundamental evolution of how the industry operated, especially after Starbucks, one of the largest specialty coffee buyers, introduced their own sustainable sourcing programme called CAFÉ practices:

I think five or eight years ago... there were niche certification schemes like Utz Kapeh and Rainforest Alliance. But I think that what happened with CAFÉ practices was that the concept of certification was adopted by a mainstream large customer (CE-EX-7).

The (sustainability) trend is quite startling... normally the coffee industry is quite a mature industry, trends happen slowly, but this trend has happened very, very fast by coffee industry standards (CE-EX-7).

Traders also found certain similarities across the various sustainability schemes. After making the adaptations to work with one programme, adapting to another one was not perceived to require the same amount of effort:

We made a big effort to make our supply chain be CAFÉ practices (Starbucks' programme) certified. In doing so it meant that we now had experience for other schemes. It was a smaller step to get to Utz certified, to Rainforest Alliance, to the Common Code of Coffee

Community and also Nespresso (CE-EX-7).

After we had adjusted to serve Nespresso AAA needs, it was very easy to adapt to Starbucks and other programmes (CE-EX-2).

The people responsible for these programmes across the different organizations also tended to be the same ones, covering the whole spectrum of sustainability programmes within a trader organization and establishing relationships with the NGOs and buyers generally on more than one scheme:

I do two things in this organization: I look after all the sustainable projects mainly aimed at certification and that sort of thing and I'm also in charge of specialty coffee, basically in Europe, that means Nespresso and Starbucks (CE-EX-5).

A part of this is of course personal relationships, we work with some of the same traders with our own certification so I think it is a level of trust that you have to build with these companies as an organization, not just for one project (CE-NG-1).

There was also a sense of competition perceived across the different schemes, and this was used in internal negotiations or in discussions with buyers:

Some people in my organization are sceptical about this programme. They say 'let's just finish this and go with Starbucks' CAFÉ practices, we can sell more to them and with lot less work and complications' (CE-EX-2).

4.7 Discussion - Propositions emerging from the research

The empirical research explored the co-evolution of commercial, personal and sustainability programme ties among actors in the context of a multi-stakeholder sustainable sourcing scheme. The purpose of this discussion section is to relate these findings to existing literature on network evolution and to present a series of implications of the research. When these implications lead to a new proposition to the theory, these are presented below the related implication.

4.7.1 Network creation: The role of embeddedness

Commercial and personal ties between many of the participating organizations predated the creation of the AAA Sustainability Network. As Figure 4-5 and Figure 4-6 (page 220 and 224) show, out of the 11 nodes that participated in the AAA Sustainability Network in 2003, 8 had at least one type of additional tie with at least one other organization.

Of the two traders that participated in the creation of the programme, one had been Nespresso's commercial partner for a long time and the second one was initiating a commercial relationship but had personal ties with two individuals in the Nespresso team who had been assigned the task of creating the initial structure of the programme. The informal communications within the so-called 'Colombia-club' members were frequent and a strong level of professional trust existed based on previous work experiences or institutional appreciation. The NGO network also had numerous personal linkages among the local organizations as they had been part of this network and had developed personal relationships over time.

Including all the organizations, Pearson correlation measures among the three networks showed a moderate but positive correlation between all networks, and suggested Personal and Commercial Networks as possible predictors of AAA Sustainability Network relationships.

Nespresso's AAA Programme represented a new area of operation and what Eisenhardt and Schoonhoven (1996) would qualify as a 'vulnerable strategic position' with a high degree of uncertainty. The situation can also be identified with what March calls an 'exploration' type of network, associated with prospective new landscapes, discovering new opportunities for wealth creation and involving innovation, basic research, risk-taking and building new capabilities (March, 1991; March, 1995). Pre-existing relationships built through parallel relationships supported this phase, allowing for experimentation and risk-taking but supported by trust built in parallel or pre-existing relationships and 'transferred' to a new situation.

The main 'new' organization in the network in 2003 was the NGO Rainforest Alliance and the associated Sustainable Agriculture Network. In this situation, the relationship with Rainforest Alliance could have responded to other motivations such as resource dependence arguments. These resources were mostly skills and geographical reach but also extended to cover an important component of credibility. There were, at the time, not many organizations that could fulfil that role and Nespresso had no previous significant links with any of them so the relationship was initiated after a phase of mutual exploration of the possibilities of cooperation.

Implication 4-1: The research provides empirical support to the theory that pre-existing multiplex relationships influence the choice of partners in the creation of networks and can support an initial exploratory phase.

In addition to multiplex networks being a predictor of the AAA Sustainability Network, this Network was also found, in turn, to be a predictor of the Personal Network. Over time, personal relationships evolved as part of the work related to the AAA Sustainability Network activities and specific formal and informal events that were organized.

After initiating the relationships and working together for two years, the consulting company GoodBrand established a very good personal relationship with the NGO network and acted as a 'bridge' across the organizations, reflected in a high normalized brokerage index of 0.50 in the Personal Network (Appendix 6.10.5). Other personal relationships were also created as the programme was developed. Relationship quality, as proposed by Ariño and de la Torre (1998), is the result of an initial store of goodwill and actual observations of behaviour over time. As the programme evolved, some individuals within some organizations were in close contact with multiple organizations. Personality-fit as well as field visits, stakeholder forums and informal gatherings also contributed to establishing personal relationships among organizations, as was the case of the regional manager in Costa Rica who after a year and a half on the job had developed a good personal relationship with actors in the other local organizations. This

again is reflected in the centralization measure of the position of the Nespresso CTCA (Costa Rica) in the overall network that occupied a higher position by 2007.

The findings are consistent with the embeddedness literature, supporting Granovetter's premise that the social relationships among individuals and the social context within which an organization operates influence the economic action of firms (Granovetter, 1985). They also lend support to the concept of past relationships becoming a repository of information on availability, competencies and reliability of prospective partners and firms (Gulati, 1995a) even when the partners are sought for a purpose other than establishing a new commercial relationship.

For the other roles in the network there was a positive correlation with existing commercial and personal linkages and this had a strong influence on the initial network structure conditions, including the choice of partners invited by Nespresso to co-create the programme and the initial collaboration structure established.

Implication 4-2: The research provides empirical support to the perspective that inter-organizational linkages influence the creation of new personal relationships.

4.7.2 Network expansion and complexity

The AAA Sustainable Network grew rapidly from 11 linked organizations in 2003 to a total of 37 by 2007, and evolved from an initial number of 25 ties to 103 ties by the end of the period analyzed. Though no organization left the network during the period, the ties among the organizations shifted. Ties were created but also deleted, especially during 2005 and 2007.

Using Koka et al.'s (2006) terminology, the network initially went through an expansion phase, with increased tie creation and reduced tie deletion, and an increase in portfolio size and range. The network also became more complex. In Choi and Krause's (2001a) definition, the network became more complex as the number of organizations increased, additional inter-relationships among organizations were established and differentiation of the organizations broadened with incorporation to the network of new types of organizations such as public sector entities.

The level of complexity could also be perceived using the social network analysis measure of centralization. A decreasing level of centralization around the focal actor, such as was the case in the research, can indicate lower ease of integration and coordination (Provan and Milward, 1995) and thus, it can be argued, increased complexity.

Implication 4-3: The network became more complex over time as the number and differentiation of organizations increased and centralization around the focal organization decreased.

Proposition: Network complexity is influenced by network size, the degree of differentiation among actors, the level of inter-relationships and the level of centralization of relationships in the network.

4.7.3 Managerial action

As a lead organization, Nespresso had the possibility of enforcing deliberate strategic changes to the organizational network, in line with the manager as network architect view (Inkpen and Currall, 2004; Kogut, 1988; Hamel et al., 1989) and the network 'plasticity' concept introduced by Davis (2008). Davis' research, however, observed deliberate changes in successful innovation-oriented networks associated with reducing information bottlenecks and opportunities to span structure holes.

In the Nespresso case, the opposite was actually the case. As the network increased in size, its density or cohesiveness decreased and this exposed it to a higher risk of being disconnected and potentially difficult to manage (Coviello, 2005). The deliberate action therefore in this case was aimed at regionalizing communication flows and increasing efficiency. Though expansion was still continuing, the priorities of what March (1991; 1995) calls an 'exploitation' type of network, increasing efficiency and the productivity of employed capital and assets, were also evident.

In the case studied, the focal organization, Nespresso headquarters, intervened in the structure of the network to moderate its complexity by introducing sub-focal organizations in the form of regional coordination offices. By 2005 the strategic objectives had become to provide structure and organization to a sometimes-chaotic communication structure that generated increased complexity and threatened the opportunities for growth. The period 2005-07 was marked by a strategic decision by Nespresso to re-organize coordination of the network, placing a regional manager in Costa Rica to serve as coordinator of the programme in Central America and, in 2007, appointing a Regional Manager in Colombia to coordinate the activities in South America. The lines of communication and coordination thus shifted and the Regional Managers took a central role in coordination of the programme. This is reflected in the measures of Regional Managers, who in 2007 became the most central positions in the network with Nespresso headquarters being the third organization in terms of direct and indirect ties but the fourth using Freeman's degree of centrality. The deliberate action in this case, therefore, was aimed at regionalizing communication flows, increasing efficiency and thus reducing complexity. The result was 'shared' centralization between the focal organization (Nespresso Headquarters) and the Regional Management Offices.

Choi and Krause (2006) also point to the capability of a focal firm in a supply network to actively manage the supply base. The network architectural perspective also identifies actions of alliance managers as major drivers of change in the networks and point to the 'plasticity' of networks that can be 'pruned' and 'paired' to adapt the network structure to the needs of the network or of the focal organization (Davis 2008).

Extending Choi and Krause's (Choi and Krause, 2006) interpretation of complexity to incorporate social network analysis measures, I propose that network managers or focal

organizations can lower the complexity of a network by modifying its structure in order to create or re-organize linkages with intermediate organizations, positively impacting the centralization and ease of management of the network.

Implication 4-4: The focal organization attenuated the impact of increased complexity by introducing coordinating nodes that centralized portions of the network organizations around them.

Proposition: Network managers in focal organizations can reduce complexity in a network by introducing or managing nodes that re-centralize relationships towards these nodes.

4.7.4 Positional power and multiplex networks

The AAA Sustainability Network was created and formally led by Nespresso and therefore it is not surprising to find Nespresso in the most central position. During the course of the interviews, most respondents explicitly or implicitly attributed to Nespresso a high level of formal power that was exercised through consultative or unilateral decision-making regarding the organizations that formed the network, the network structure and the activities, resources and coordination mechanisms.

As evidenced in the vast literature on the topic, power can emanate from multiple sources and, as Hardy and Leiba-O'Sullivan (Hardy and Leiba-O'Sullivan, 1998) argue, different theoretical perspectives on power sources should not be considered as mutually exclusive alternatives but as parallel modes of operation. This research focused its analysis on positional power. The position of the actors in a network has been identified as one potential source of power and social network theory associates power opportunities with the relative position of an actor or organization in a network and its relative access to social capital (Brass and Burkhardt, 1992). In this context, network central and brokerage roles offer an opportunity to exert a higher level of power (Burt, 1992; Freeman, 1979). Nespresso headquarters consistently occupied a central – though decreasingly so – position in the network. In 2003, Freeman's centralization degree for the organization represented an 18% share of the total. By 2007, Nespresso headquarters' centralization degree represented only 6%. This was, however, offset by the presence of the regional organizations, which accounted for 7% of total network centralization by 2007.

A second group of actors, composed mostly of local NGOs, occupied the next level of central positions. These local organizations operated in the areas where the programme was most active (Colombia and Costa Rica) and were thus placed in central positions in the network, connected to the local operations but also, through the Sustainable Agriculture Network, to all other local NGOs involved in the programme. This position did offer advantages for information sharing across NGOs in different locations.

In addition to this, the findings also suggest that power can originate not only within the network but can derive from occupying powerful positions in parallel networks. The structure analysis of the Nespresso AAA Network was replicated for the Commercial and Personal Networks.

In the Commercial Network, Nestlé headquarters, the parent organization of Nespresso, for example, has a very central position with commercial linkages with most traders that participate in the AAA Sustainability Network. Ecom and the FNC Colombia also occupy central positions in the Commercial Network, as they are responsible for commercializing the product from multiple 'clusters' or sub-regions participating in the AAA Sustainability Network.

Though the analysis didn't include the relative size of the different organizations, it should be noted that Nestlé, as the largest coffee roaster in the world and concentrating 20.2% of the total global market (Euromonitor Global Market Information Database, 2008), is a major customer for coffee traders. The large traders that could accompany the fast company growth and could integrate management of the programme across multiple locations were at an advantage vis-à-vis smaller suppliers and this provided these actors a more central and powerful position in the Commercial Network, which also had implications for the Sustainability Network.

Traders also appeared to enjoy opportunities to exert power as a consequence of joint-affiliations to competing programmes, becoming what Burt alludes to as 'Tertius Gaudens' or the 'third that benefits' (Burt, 1992).

In the Personal Network, a central position in 2002-03 was occupied by FNC Colombia, an organization that was not at the time part of the AAA Sustainability Network but which was a centre of the 'Colombian club' that included two executives at Nespresso, the representative of Expocafé in Europe, local operations in Colombia and the FNC representative in Europe. Informal communications among this group of actors were very active, with a strong level of professional trust based on previous work experiences or institutional appreciation. The NGO network also had numerous personal linkages among the local organizations as they had been part of this network and had developed personal relationships over time.

Based on these findings, I propose to extend the theory of network position as a source of power by expanding it to include the role of positions in multiplex relationships:

Implication 4-5: The research provided empirical support to the theory that power opportunities are likely to be higher for actors occupying central positions in networks.

Implication 4-6: The research results further suggest that positional power can also be available to actors occupying central locations or bridging structure holes in multiplex networks.

Implication 4-7: An organization participating in multiple competing networks can increase its power position vis-à-vis other actors in the network.

Proposition: The research extends the relationships between structure position and power to also integrate power opportunities available to actors occupying central locations or bridging structure positions in multiplex networks.

4.8 Managerial implications

The research also holds implications in two important areas for managers involved in creating or managing network relationships.

The first refers to the importance of assessing not only the relationships within the network under study but also to incorporate information from parallel networks and other relationships. When initiating projects, previous or multiplex relationships can provide an important and trusted source of partnerships. Though these relationships are sometimes unconsciously brought into the discussion, managers could benefit from explicitly listing and assessing current partnerships or relationships in other domains with skills or assets that could be transferred to a new situation.

Secondly, the importance and opportunities of mapping employees' informal relationships within a group or a network (Krackhardt and Hanson, 1993; Iacobucci, 2007) has already been pointed out. Extending beyond the borders of the network can also provide important insights into communication flows and opportunities to exert or manage power that would otherwise not be identified.

Thirdly, by understanding and measuring the structural characteristics of the network, a manager can actively modify the network and assess the possible impacts on efficiency or density of proposed changes, at least with regard to the formal structure of the network. As said before, the informal or personal linkages also need to be taken into consideration simultaneously as they could result in very different views of the organization.

An important consideration for managers is the opportunities that are now available through new technology tools that can translate conceptual frameworks into pragmatic tools. For example, social networking sites can link personal and organizational networks and can be powerful tools for managers who want to get a better understanding of the structure of the multiplex networks that the organization participates in.

4.9 Conclusion

The research studied the evolution of network structure conditions over time in relation to the role played by managerial action and by context factors, including multiplex relationships and cross-affiliations among actors in the network.

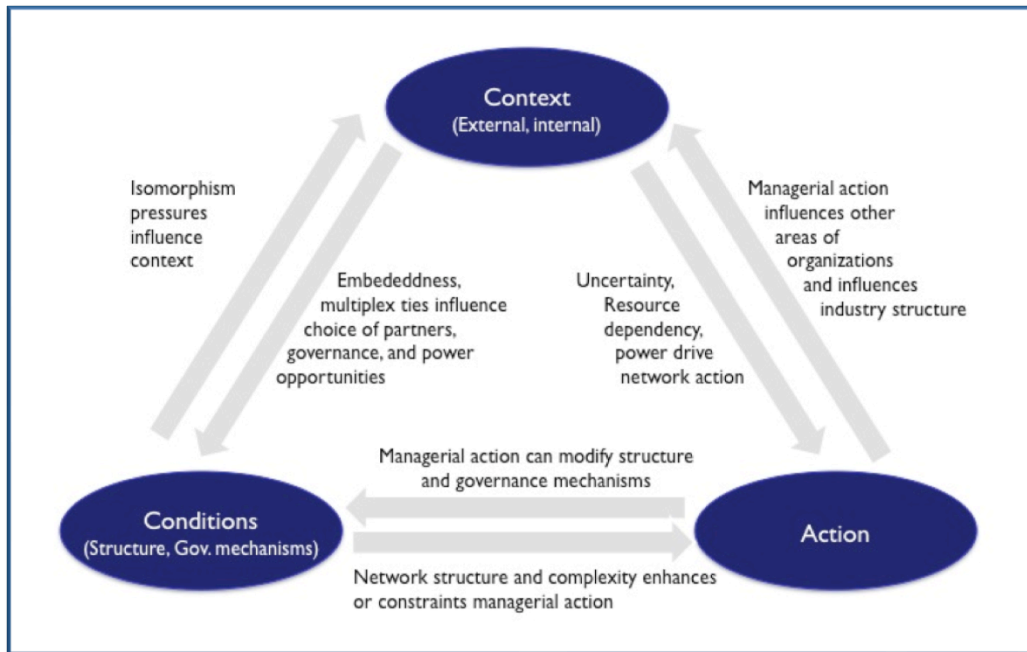
Based on a longitudinal analysis of a new multi-stakeholder network created to implement a sustainable supply chain initiative, the findings of the research suggest that network structure and conditions are influenced by managerial action but are also embedded in a context of multiplex relationships and cross-affiliations among actors, which in turn influences the distribution of power in the network.

Pre-existing commercial and personal relationships can influence the choice of partners and the initial network structure and conditions. These multiplex relationships can also impact the distribution of power in a network, influenced by positions and power of the actors in other networks involving the same actors or with ties to competing networks. Multiplex ties and multiple affiliations also influence the environment in which the network operates, facilitating information flows across competing networks and stimulating isomorphic trends.

The structure of a network is therefore both the result of context conditions and of managerial action. This in turn influences the environment in which the network operates. Although the research did not explicitly explore the issue of isomorphism across sustainability networks, institutional theory literature suggests that conditions in one network can have implications on other networks in the industry through isomorphic pressures (DiMaggio and Powell, 1983; Koza and Lewin, 1998). Evolution of the structure also generates additional complexity for managers to operate. Evolution of network conditions, including the size, structure and relationships, can influence the complexity of the network and make it more difficult to manage. Managers can, however, actively shape network structures and governance mechanisms to adapt to evolving needs.

Each of these elements and the relationships among them has been explored in the research. Together, they propose a model, represented in Figure 4-12, contributes to the understanding of the co-evolution of context, conditions and action in networks.

Figure 4-12: Co-evolution of networks



4.10 Summary of research questions, findings and propositions

As a summary of the findings, Table 4-15 presents the key findings for each of the question and identifies the relevant Section where this was addressed.

Table 4-15: Summary of research questions, findings and propositions

Question	Research Findings	References in thesis
How does a context of multiplex ties among actors influence the creation and evolution of networks?	<p>Research findings: Pre-existing commercial and personal ties favoured in creation of studied network also influenced its structure.</p> <ul style="list-style-type: none"> • Out of the 11 nodes that participated in the initial network in 2003, 8 had at least one type of additional tie with another node. • Pearson correlation measures among three networks show moderate but positive correlation between all networks. 	Section 4.7.1
How and why does network structure evolve over	<p>Research findings: Structure evolution influenced by context (uncertainty, isomorphism, multiplexity) and complexity (size, differentiation, centralization) and managerial action.</p> <ul style="list-style-type: none"> • Network growth: From 11 linked organizations in 2003, to 37 by 2007, ties grew from 25 to 103 during the same period. 	Section 4.7.2

time?	<ul style="list-style-type: none"> • Network complexity increased by size, increased differentiation and decreased centralization. • As lead organization, Nespresso managed the formal communication linkages between organizations and re-structured the network to promote efficiency. <p>Proposition: Network complexity is influenced by network size, degree of differentiation among actors, level of inter-relationships and level of centralization of the network.</p>	
How does actor relative positioning in multiplex network influence positional power opportunities?	<p>Research findings: Positional power opportunities for actors occupying privileged positions in multiplex networks.</p> <ul style="list-style-type: none"> • Actors occupying central positions in commercial network and in multiple competing sustainability programmes (outside Nespresso) were found to be able to exert a higher level of power in the Sustainability Network (Nespresso AAA Programme). • Actor occupying central positions in Personal Network appeared to have exerted more influence in the creation and definition of the AAA Programme. <p>Proposition: Research extends the relationships between structure position and power to include power opportunities available to actors occupying strategic locations in multiplex networks.</p>	Section 4.7.4

4.11 Limitations

The findings and conclusions of this study have to be assessed within the context of several limitations. While the research methodology has explicitly incorporated means to reduce the impact of these limitations whenever possible, the choices made in scope and research methodology imply a restriction to the extent to which this can be achieved.

A first limitation relates to the use of a single-case study and the need to observe caution in generalizing any findings beyond the specific context studied. As Doz (1996) states: ‘Findings from a few case studies, no matter how carefully sampled and researched, obviously deserve healthy caution’. Because the number of multi-stakeholder sustainable sourcing schemes already in the execution stage is still very limited, each represents an ‘extreme or unique’ case rather than being representative of a broader phenomenon. As Yin (1994) argues, this can validate the use of in-depth single-case analysis. The limitation of the use of a single-case study has also been partially mitigated by the structured literature review that informed the development of the explanatory model and served as a basis to contrast the findings derived from the field research.

A second limitation stems from the choices made regarding mapping personal network relationships. Only positive relationships were considered. A richer understanding of the role of personal relationships could have been achieved by including also negative feelings among individual actors and between these actors and organizations. As low trust has been identified with lengthy and complicated negotiations (Williamson, 1975), integrating data on both positive and negative relationships would have provided important insights.

A third methodological research limitation, which relates to the previous one, is the limited number of actors involved in the overall network. Even though assurances of confidentiality were given and efforts to protect the privacy of respondents were made, the reduced number of actors in the network is likely to facilitate linking specific actors to statements made and some of the respondents may have been more cautious than in an anonymous, large sample questionnaire. Though this was addressed via triangulation of data and relatively long and semi-structured interviews, it is nevertheless a limitation of this type of research

A fourth and final limitation is the inherent risk of post sense-making or impression management (Eisenhardt and Graebner, 2007) in a retrospective longitudinal study. The selection of respondents representing different organizations, hierarchical levels, geographies and tenures is expected to help mitigate this limitation by representing multiple points of view of the same process.

4.12 Opportunities for further research

The current study also took the role of network position as a key indicator of opportunities to exert power. As identified in the literature and mentioned in the research, other sources of power include formal power, resource dependency, personality, etc. A possible extension of the research could analyze jointly alternative sources of power present in parallel networks and their effect on the network under study. For example, in addition to the central position that NGOs associated with the Sustainable Agriculture Network occupied, the NGOs exerted influence on the creation and evolution of the network as a result of their expertise on the topic and subsequent participation in the co-creation of the programme guidelines. A third and important source of power for Rainforest Alliance and the Sustainable Agriculture Network stemmed from the reputational benefits they provided to Nespresso. An independent organization involved in this type of programmes can provide important independent assurances to consumers, the media and other stakeholders, with important credibility benefits for the programme.

The study of the impact of joint-affiliation in networks also deserves additional attention. A first consequence was that joint-affiliation facilitated information sharing and could have promoted a mimetic adoption of practices, in support of the view that imitation follows ties among organizations (Ahuja, 2000; Galaskiewicz and Burt, 1991; Galaskiewicz and Wasserman, 1989). A high level of uncertainty relating to the activities, resources and coordination mechanisms to propose was present in the beginning of Nespresso's AAA Programme. As time went by, organization learning based on its own experience was integrated with learning generated by organizations participating in multiple sustainability programmes. Though a good extent of differentiation exists today among the programmes, the research found that participating organizations saw more similarities over time across the programmes. This lends support to the institutional theory view that as common alliance practices emerge, they are copied over time and

eventually become generally accepted practices (Baum and Oliver, 1991; Brass et al., 2004).

Another possible extension of this research would consist of incorporating measures for the magnitude of relationships. In particular, in the Commercial Network there were wide differences in the size, geographical coverage and business potential of the various relationships. Smaller organizations could have been found to be more flexible and accommodating in an exploratory type of network but large actors could obtain more leverage through their scale of business. As expressed during an interview:

One risk of the programme is that it may be growing too fast. In sales, in volume of AAA coffee, it is growing very fast and it puts pressure on the capacity of several traders (LO-NN-21).

To conclude, as Granovetter pointed out, there is need of extending the embeddedness concept and to study what happens in a dynamic process where 'you have to look at how people make use of their location in social networks to mobilize resources in order to achieve their economic goals (Granovetter, 1990)'. As put by one of the executives interviewed in the research:

In the traditional model, the one buying was the one dictating the rules. Here, however, this power is not so absolute and there are a lot of other considerations... (CE-NN-1)

Exploring these considerations further can contribute to a better understanding of networks and how these can become a strategic resource to organizations seeking to collaborate in existing and new areas of cooperation.

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6 Appendices: Additional research data

6.1 Definitions used in this research

Assessment: Relationships can be assessed in terms of efficiency and equity (Ouchi, 1980). An alliance is efficient in a Pareto optimal way if there is no other alternative arrangement that would leave one party better off without the other being worse off. It fulfils equity conditions if the standards of reciprocity are met (Ariño and de la Torre, 1998).

Centrality: Associated with a node being the object of many relations (degree), being in the paths that connect others (betweenness) or having access to others who are connected (closeness). Centrality has been identified as a potential source of positional power based (Nohria, 1992; Brass and Burkhardt 1992).

Clique: Refers to a subset of nodes that are tightly linked among each other but isolated from others. Nodes in a clique are adjacent to each other and there are no other nodes that are also adjacent to all of the members of the clique (Wasserman and Faust, 1994).

Complexity: The degree of varied elements and their interactions within a system (Choi and Krause 2006).

Context: External context refers to the environment external to the network but in which the network is embedded. Internal context refers to the strategy, operations, culture and values of the organizations participating in a certain network.

Cohesiveness: Cohesive networks are characterized by high density, mutuality among group ties and a higher relative frequency of ties among group members than nonmembers (Wasserman and Faust, 1994; Blau, 1977). Density is used as a measure to estimate the level of cohesion found in a network, defined as the ration of actual to potential ties.

Governance mechanisms: The variety of coordination mechanisms employed to sustain network cooperation including formal mechanisms such as the specific set of contracts and obligatory arrangements, the legal structure used to govern the relationship; and informal mechanisms such as the implicit norms of behaviour, conventions or standards and pledges.

Inter-organization networks: Relatively enduring relationships established between an organization and one or more organizations in its environment involving the sharing of information, resources, activities or capabilities.

Networks: A set of nodes and the set of ties representing some relationship, or lack of relationship, between the nodes (Mitchell, 1969)

Negotiation: Includes the formal bargaining process and choice behaviour of parties over the terms and conditions of a potential relationship (Ring and Van de Ven, 1994).

Multiplex ties: The extent to which at least two ties (for example, personal and commercial ties) coincide over the analyzed population (Skvoretz and Agneessens, 2007).

Multi-stakeholder network: Multi-stakeholder networks are distinguished from other inter-organizational networks to explicitly include non-corporate institutions such as governments or non-governmental organizations playing an active role in the relationship.

Network conditions: Refers to the set of actors, bonds or structure, resource ties and activity links that are present in a network (Häkansson and Snehota, 1995) and the set of governance mechanisms that are used to coordinate the relationship.

Power: Denotes the 'ability to influence, control, or resist the activities of others' (2008). In a network setting, it has been observed that a key group of nodes within the network often play a central role as the main carriers of rules and practices (Hendry et al., 1999) and result in the development of dominant logics at network and community levels (Owen-Smith and Powell, 2004).

Relational quality: The quality of a relationship that is a function of factors such as personal bonds between key executives, trust, reputation and previous contributions (Ariño and de la Torre, 1998).

Social network: A set of nodes (e.g. persons, organizations) linked by a set of social relationships (e.g. friendship, transfer of funds, overlapping membership) of a specified type (Laumann et al., 1978, p.458).

Stakeholder: A stakeholder is any group or individual who can affect or is affected by the achievement of the organization's objectives (Freeman 1984, p. 46).

Sustainability: 'Sustainable Development is the development that meets the needs of current generations without compromising the ability of future generations to meet their needs and aspirations' (Report of the World Commission on Environment and Development, 1987). The term is used in this paper incorporating ecological, social and economic aspects of sustainability and includes specific sustainability programmes and initiatives such as Fair Trade, Organic and Social Corporate Responsibility.

Sustainable Sourcing: Management of raw materials and services from suppliers to manufacturer/service provider to customer and back with improvement of the social and

environmental impacts explicitly considered (New Zealand Business Council for Sustainable Development, 2003).

6.2 Appendix: Network typologies

Referred to in Section 2.3.1

In our broad definition of networks the term encompasses a wide range of types of relationships. Alternative typologies of networks have been proposed in the literature using different variables related to the field of study. Management literature, for example, distinguishes equity vs. non-equity based relationships (Gulati, 1995a; Thorelli, 1986), while network theorists, on the other hand, apply network structure terminology to describe relationships, defining networks by variables such as centrality, i.e. the degree to which the firm has a strategically important position in the network (Freeman, 1979), the composition and positioning of the ties among firms (Baker, 1990), and the density, multiplexity and reciprocity of ties among the actors (Achrol, 1997).

This review will use alternative typologies based on the literature being examined but an outline of the main typologies present in the literature will provide an overview of the scope of the topic. The four main drivers for classifying relationships are 1) by nature of the relationship: vertical or horizontal; 2) by equity ties: equity or non-equity; 3) by type of organization: single (private or public) sector vs. cross sector; 4) by the structure of the resulting network.

Horizontal vs. vertical relationships:

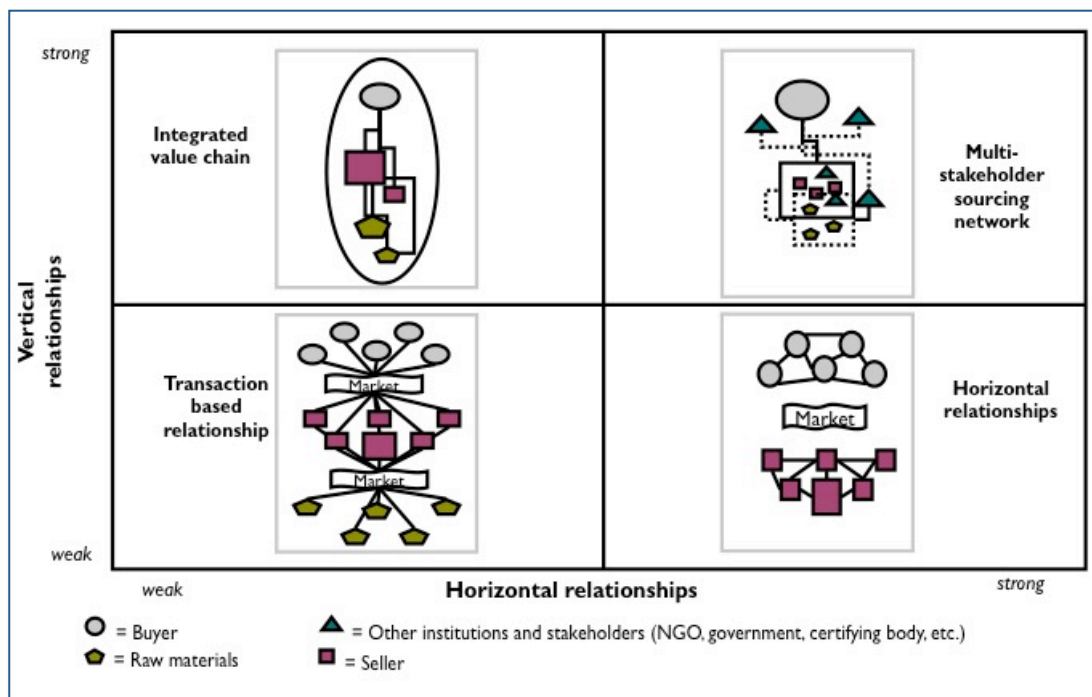
Relationships can be classified with regard to the extent of vertical and/or horizontal interaction between different organizations. Vertical relationships on the one hand are built on distribution of activities and resources among actors in a supply chain, involving exchange relationships along stages of a supply chain and where one unit acts mainly as a 'buyer' and another one as a 'seller' of services or goods. Horizontal relationships on the other hand are established among similar types of organizations seeking a shared purpose.

Grandori and Soda (1995) characterize buyer-seller relationships by the extent of the vertical as well as the horizontal relationships among the organizations involved, defining inter-firm networks as a 'mode of regulating interdependence between firms which is different from the aggregation of these units within a single firm and from coordination through market signals' (Grandori and Soda, 1995, p. 184). Achrol (1997) also distinguishes vertical and horizontal relationships, including internal relationships within a firm, thus resulting in four network types: internal market (within the boundaries of a single firm), vertical market (direct supply or distribution relationships organized around a focal organization), inter-market or keiretsu (dense interconnections in resource sharing, decision making, culture and identity) (Lincoln et al., 1992), and opportunity

market (firms specializing in various products or technologies that are assembled and disassembled in temporary arrangements).

Alvarez and Wilding (Alvarez and Wilding, 2007) also propose a classification of networks according to the level of horizontal and vertical integration. Figure 10.1 illustrates the resulting two-by-two diagram with arms-length type of relationships located on the lower left corner and a vertical-horizontal multi-actor network in the upper right corner.

Figure 6-1: Types of network relationships



Source: (Alvarez and Wilding, 2007)

A first type of relationship with limited or no vertical or horizontal integration can be characterized as a ‘Transaction Based Relationship’ corresponding to what Webster (1992) defines as ‘a pure market form of economic organization, all activity is conducted as a set of discrete, market-based transactions and virtually all necessary information is contained in the price of the product that is exchanged’. A second type of relationship, an integrated vertical or supply chain relationship, exhibits a high degree of coordination between buyers and sellers and involves collaboration between supply chain members (Spekman et al., 1998b; Gereffi, 1994; Lambert et al., 1999). A third type of relationship can be characterized by a high degree of horizontal interaction. This is the case of business relationships such as R&D consortia, joint ventures, industry associations, etc. A fourth type of relationship combines a higher intensity of vertical integration as well as horizontal integration. Sourcing networks involve a high degree of horizontal integration as well as strong buyer-seller relationships. The Japanese ‘keiretsu’ is also an example of coexisting intense vertical and horizontal integration with interlinked ownership and trading relationships, bound together in long-term relationships based on reciprocity. A ‘cluster’ can also be a specific type of this relationship as a ‘geographically proximate

group of interconnected companies and associated institutions in a particular field linked by commonalities and complementarities' (Porter, 1998).

Equity vs. non-equity:

A common typology used in management literature, an equity joint venture occurs when partners transfer assets to an independent legal entity and are paid for some or all of their contribution from the profits earned by the entity (Hennart, 1988). Non-equity arrangements don't involve the sharing or exchange of equity and generally do not necessitate a new independent organization (Currall and Inkpen, 2000). They can take the form of contracts such as licensing, distribution agreements, management contracts etc. (Gulati, 1995b; Hennart, 1988).

Network structure:

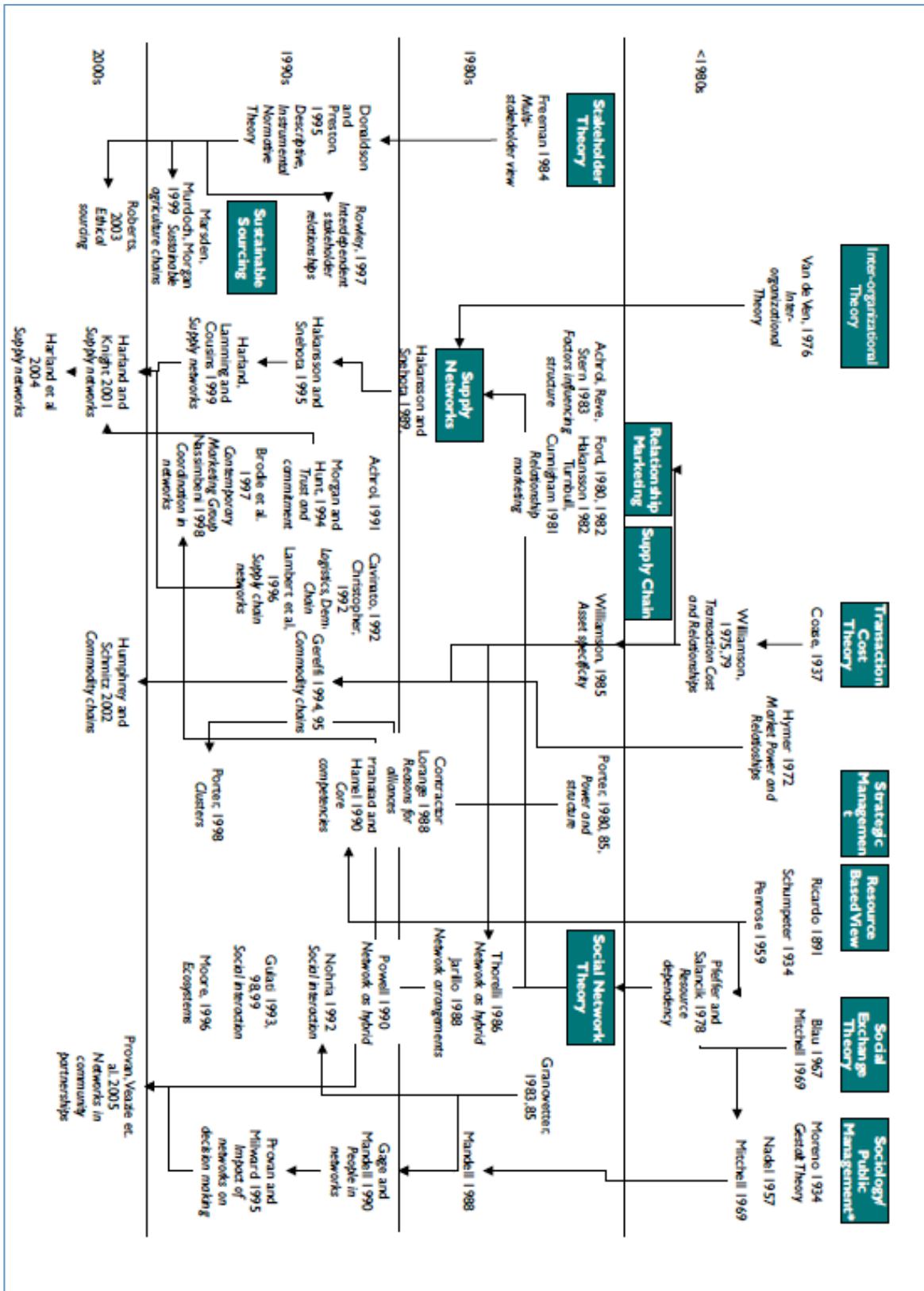
Social network analysis is probably the area that has focused more on the analysis of the structure elements of a network organization. Originally applied to small-group research, it argues that actions and behaviours of individuals and organizations can be explained in the context of their position in a network, which is itself constantly being reproduced by the actions of these individuals and organizations (Granovetter, 1992). A social network can be defined as 'a set of nodes (e.g. persons, organizations) linked by a set of social relationships (e.g. friendship, transfer of funds, overlapping membership) of a specified type' (Laumann et al., 1978, p. 458). The network can be described both from an actor's perspective regarding its centrality, i.e. the degree to which the firm has a strategically important position in the network (Freeman, 1979), and on the basis of the composition and positioning of its ties to other firms (Baker, 1990). The network can also be described as a whole in terms of the density, multiplexity and reciprocity of ties among all actors and any systems defining membership roles and responsibilities (Achrol, 1997).

By type of organization:

Networks can also be classified by the type of organization participating in the relationship, namely a private or a public entity. Cross-sector collaboration is a specific type of relationship that has been defined as 'the linking or sharing of information, resources, activities and capabilities by organizations in two or more sectors to achieve jointly an outcome that could not be achieved by organizations in one sector separately' (Bryson et al., 2006).

6.3 Literature overview (from author's Scoping Study, December 2007)

Referred to in Section 2.4



6.4 Systematic Literature review: Articles included in the review

Referred to in Section 2.5.2

6.4.1 Articles included in the review from keyword search (N=104)

Author	Year	Title	Journal
1 Achrol	1997	Changes in the Theory of Inter-organizational Relations in Marketing: Towards a Network Paradigm	Journal of Marketing
2 Adobor	2006	The role of personal relationships in inter-firm alliances: Benefits, dysfunction, and some agreements	Business horizons
3 Ahuja	2000	Collaboration Networks, structural holes, and innovation: A longitudinal study	Administrative Science Quarterly
4 Anand and Khanna	2000	Do firms learn to create value? The case of alliances	Strategic Management Journal
5 Anderson and Weitz	1992	The use of pledges to build and sustain commitment in distribution channels	JMR, Journal of Marketing Research
6 Argenti	2004	Collaborating with activists: How Starbucks works with NGOs	California management review
7 Ariño and de la Torre	1998	Learning from Failure: Towards an evolutionary model of collaborative Ventures	Organization Science
8 Ariño et al.	2001	Relational quality: Managing trust in corporate alliances	California Management Review
9 Ariño et al.	2005	Relational quality and interpersonal trust in strategic alliances	European Management Review
10 Artz	1999	Buyer-Supplier Performance: The role of Asset specificity...	British Journal of Management
11 Arya and Salk	2006	Cross-Sector Alliance Learning...	Business Ethics Quarterly
12 Baker and Faulkner	2002	Inter-organizational networks	Book, Section
13 Barley et al.	1992	Strategic Alliances in Commercial Biotechnology	Book, Section
14 Benson	1975	The interorganizational network as political economy	Administrative Science Quarterly
15 Boddy et al	2000	Implementing collaboration between organizations: An empirical study of supply chain partnering	Journal of Management Studies
16 Borgatti and Foster	2003	The network paradigm in organizational research...	Journal of Management
17 Brennan and Turnbull	1999	Adaptive behaviour in buyer-supplier...	Industrial Marketing Management
18 Bryson et al	2006	The Design and Implementation of Cross-Sector...	Public administration review
19 Carter	2005	Purchasing social responsibility and firm performance	International Journal of Physical Distribution & Logistics Management
20 Carter and Jennings	2004	The role of purchasing in corporate social responsibility: a structural equation analysis	Journal of Business Logistics
21 Cox	2001	Understanding Buyer and Supplier Power: A Framework for Procurement and Supply Competence	Journal of Supply Chain Management: A Global Review of Purchasing & Supply
22 Cox et al	2005	Supplier relationship management as an investment: evidence from a UK study	Journal of General Management
23 Das and Teng	2000	A Resource-Based Theory of Strategic	Journal of Management

Author	Year	Title	Journal
		Alliances	
24	Das and Teng	2002 Alliance constellations: A social exchange perspective	Academy of Management. The Academy of Management Review
25	Das and Teng	2002 The dynamics of alliance conditions in the alliance development process	The Journal of Management Studies
26	de Bakker and Nijhof	2002 Responsible Chain Management: A Capability Assessment Framework	Business Strategy and the Environment
27	de Man and Burns	2006 Sustainability: supply chains, partner linkages, and new forms of self-regulation	Human Systems Management
28	Dekker	2004 Control of inter-organizational relationships: evidence on appropriation concerns and coordination requirements	Accounting, Organizations & Society International Studies of Management & Organization
29	Doz	1987 Technology partnerships between larger and smaller firms: Some critical issues	
30	Doz	1996 The evolution of cooperation in strategic alliances: initial conditions or learning processes?	Strategic Management Journal (1986-1998)
31	Dwyer, Schurr and Oh	1987 Developing Buyer-Seller Relationships	Journal of Marketing International Journal of Physical Distribution & Logistics Management
32	Ellram and Edis	1996 A Case Study of Successful Partnering Implementation	
33	Faulkner and De Rond	2000 Cooperative Strategy: Economic, Business and Organizational Issues	Book, Section
34	Fey and Beamish	2000 Joint venture conflict: the case of Russian international joint ventures	International Business Review
35	Ford	1980 The Development of Buyer-Seller Relationships in Industrial Markets	European Journal of Marketing
36	Ford and Redwood	2005 Making sense of network dynamics through network pictures: A longitudinal case study	Industrial Marketing Management
37	Forman and Jorgensen	2004 Organising Environmental Supply Chain Management	Greener Management International
38	Ganesan	1994 Determinants of Long-Term Orientation in Buyer-Seller Relationships	Journal of Marketing Review of International Political Economy : RIPE.
39	Gereffi and Humphrey	2005 The governance of global value chains	
40	Giovannucci and Ponte	2005 Standards as a new form of social contract? Sustainability initiatives in the coffee industry	Food Policy
41	Goldbach, Seuring and Back	2003 Co-ordinating Sustainable Cotton Chains for the Mass Market - The Case of German Mail-Order Business OTTO	Greener Management International
42	Grandori and Soda	1995 Inter-firm Networks: Antecedents, Mechanisms and Forms	Organization Studies
43	Grandori and Soda	2006 A Relational Approach to Organization Design	Industry and Innovation
44	Granovetter	1985 Economic action and social structure: The problem of embeddedness	American Journal of Sociology
45	Granovetter	2005 The Impact of Social Structure on Economic Outcomes	The Journal of Economic Perspectives
46	Gray	2000 Assessing inter-organizational collaboration; Cooperative Strategy: Economic, Business and Organizational Issues	Book, Section
47	Gulati	1995 Does familiarity breed trust? The implications of repeated ties for contractual	Academy of Management Journal

Author	Year	Title	Journal	
		choice in alliances		
48	Gulati	1999	Network location and learning: The influence of network resources and firm capabilities on alliance formation	Strategic Management Journal
49	Gulati and Gargiulo	1999	Where do Inter-organizational Networks come from?	The American Journal of Sociology
50	Hagen and Choe	1998	Trust in Japanese Interfirm relations: Institutional sanctions matter	Academy of Management Review
51	Hakansson	1982	International Marketing and Purchasing of Industrial Goods: An Interaction Approach	Book, Section
52	Hakansson and Ford	2002	How should companies interact in business networks?	Journal of Business Research
53	Harland	1996	Supply Chain Management: Relationships, Chains and Networks	British Journal of Management
54	Harland et al	2004	Conceptual Model for Researching the Creation and Operation of Supply Networks	British Journal of Management
55	Heide and John	1992	Do Norms Matter in Marketing Relationships?	Journal of Marketing
56	Holm et al	1999	Creating Value Through Mutual Commitment to Business Network Relationships	Strategic Management Journal
57	Humphrey and Schmitz	2002	How does insertion in Global Value Chains Affect Upgrading in Industrial Clusters?	Regional Studies
58	Ingenbleek and Meulenber	2006	The battle between 'good' and 'better': A Strategic Marketing Perspective on Codes of Conduct for Sustainable Agriculture	Agribusiness
59	Ivens	2005	Flexibility in industrial service relationships: The construct, antecedents, and performance outcomes	Industrial Marketing Management
60	Iwanow et al.	2005	The influence of ethical trading policies on consumer apparel purchase decisions	International Journal of Retail & Distribution Management
61	Jap and Ganesan	2000	Control Mechanisms and the Relationship Life Cycle: Implications for Safeguarding Specific Investments and Developing Commitment	JMR, Journal of Marketing Research
62	Johnsen and Ford	2006	Interaction capability development of smaller suppliers in relationships with larger customers	Industrial Marketing Management
63	Johnsen et al.	2000	Networking activities in supply networks	Journal of Strategic Marketing
64	Jones and Wicks	1999	Convergent Stakeholder Theory	The Academy of Management Review
65	Jones, Hesterly and Borgatti	1997	A General Theory of Network Governance: Exchange Conditions and Social Mechanisms	Academy of Management Review
66	Kale, Dyer, Singh	2001	Value Creation and Success in Strategic Alliances: Alliancing Skills and the Role of Alliance Structure and Systems	European Management Journal
67	Kale, Singh, Perlmutter	2000	Learning and protection of proprietary assets in strategic alliances: building relational capital	Strategic Management Journal
68	Kogg	2003	Greening a Cotton-textile Supply Chain Building commitment, attachment, and trust in strategic decision-making teams: The role of procedural justice	Greener Management International
69	Korsgaard et al.	1995		Academy of Management Journal

	Author	Year	Title	Journal
70	Kothandaraman,Prabakar; Wilson, David T.	2001	The future of competition: Value-creating networks	Industrial Marketing Management
71	Kumar and Andersen	2000	Inter firm diversity and the management of meaning in international strategic alliances	International Business Review
72	Lambert and Cooper	2000	Issues in Supply Chain Management	Industrial Marketing Management
73	Lambert et al	1999	Building Successful Logistics Partnerships	Journal of Business Logistics
74	Lamming et al	2000	An initial classification of supply networks	International Journal of Operations and Production Management
75	Lavie	2006	The Competitive Advantage of Interconnected firms: An extension of the resource-based view	The Academy of Management Review
76	Lavie, Lechner and Singh	2007	The performance implications of timing of entry and involvement in multipartner alliances	Academy of Management Journal
77	McWilliams and Siegel	2001	Corporate Social Responsibility: A Theory of the Firm Perspective	The Academy of Management Review
78	Mohr and Spekman	1994	Characteristics of Partnership Success: Partnership attributes, communication behaviour, and conflict resolution techniques	Strategic Management Journal
79	Mohr et al.	2001	Do Consumers Expect Companies to be Socially Responsible? The Impact of Corporate Social Responsibility on Buying Behaviour	The Journal of Consumer Affairs
80	Morgan and Hunt	1994	The Commitment-Trust Theory of Relationship Marketing	Journal of Marketing
81	Nassimbeni	1998	Network structures and co-ordination mechanisms	International Journal of Operations & Production Management
82	Naudé and Buttle	2000	Assessing Relationship Quality	Industrial Marketing Management
83	Nielson	1998	An empirical examination of the role of 'closeness' in industrial buyer-seller relationships	European Journal of Marketing
84	Nohria	1992	Is network perspective a useful way of studying organizations?	Book, Section Academy of Management
85	Oliver	1990	Determinants of Inter-organizational Relationships: Integration and Future Directions	The Academy of Management Review
86	Overdest	2004	Codes of Conduct and Standard Setting in the Forest Sector; Constructing Markets for Democracy?	Relations Industrielles
87	Peck and Jütner	2000	Strategy and Relationships: Defining the Interface in Supply Chain Contexts	International Journal of Logistics Management
88	Ponte and Gibbon	2005	Quality standards, conventions and the governance of global value chains	Economy and Society
89	Porter and Kramer	2006	Strategy and Society: The Link Between Competitive Advantage and Corporate Social Responsibility	Harvard business review
90	Powell, W.W.	1990	Neither market nor hierarchy: network forms of organization	Book, Section Administrative Science Quarterly
91	Provan and Milward	1995	A Preliminary theory of inter-organizational network effectiveness	Administrative Science Quarterly
92	Rábade and Alfaro	2006	Buyer-supplier relationship's influence on traceability implementation in the vegetable industry	Journal of Purchasing & Supply Management

	Author	Year	Title	Journal
93	Reuer et al.	2002	Post-formation dynamics in strategic alliances	Journal of Management Academy of Management. The Academy of Management Review
94	Rowley	1997	Moving beyond dyadic ties: A network theory of stakeholder influences	Strategic Management Journal (1986-1998)
95	Smith Ring and Van de Ven	1992	Structuring Cooperative Relationships between organizations	Academy of Management Review
96	Smith Ring and Van de Ven	1994	Developmental Processes of Cooperative Inter-organizational Relationships	California management review
97	Smith Ring, Doz, Olk	2005	Managing formation processes in R&D consortia	Supply Chain Management
98	Spekman et al.	1998	Alliance management: A view from the past and a look to the future	The Academy of Management Review
99	Subramanian et al	2006	Constructive Partnerships: When Alliances between private firms and public actors can enable creative strategies	Strategic Management Journal
100	Thorelli	1986	Networks: Between markets and hierarchies	Journal of Business & Industrial Marketing
101	Turnbull, Ford and Cunningham	1996	Interaction, relationships and networks in business markets: an evolving perspective	Academy of Management. The Academy of Management Review (pre-1986)
102	Van de Ven	1976	On the nature. Formation and maintenance of relations among organizations	Academy of Management. The Academy of Management Review
103	Van de Ven and Poole	1995	Explaining development and change in organizations	The Journal of Management Studies
104	Zajac and Olsen	1993	From transaction cost to transactional value analysis: Implications for the study of inter-organizational strategies	

6.4.2 Additional references used: Background research or specific topics

	Author	Year	Title	Journal
1	Alvarez and Wilding, R	2007	A sustainable cup of coffee? An analysis of sustainable sourcing programmes among the largest coffee roasters	Unpublished material
2	Ariño, A. and Reuer, J. J	2006	Introduction: Governance and Contracts in Strategic Alliances	Book section
3	Ariño, A. and Reuer, J. J	2004	Designing and Renegotiating Strategic Alliance Contracts	The Academy of Management Executive The American Journal of Sociology
4	Baker, W. E.	1990	Market Networks and Corporate Behaviour	
5	Baligh, H. H., Burton, R. M. and Obel, B.	1996	Organizational consultant: Creating a useable theory for organizational design	Management Science
6	Barney, J.	1991	Firm Resources and Sustainable Competitive Advantage	Journal of Management

	Author	Year	Title	Journal
7	Barringer, B. R. and Harrison, J. S	2000	Walking a tightrope: Creating value through inter-organizational relationships	Journal of Management
8	Baum, J. A. C. and Oliver, C.	1991	Institutional Linkages and Organizational Mortality	Administrative Science Quarterly
9	Blau, P. M.	1964	Exchange and power in social life	Book
10	Bleeke, J. and Ernst, D	1991	The Way to Win in Cross-Border Alliances	Harvard business review
11	Blumberg, B. F	2001	Cooperation contracts between embedded firms	Organization Studies
12	Bradach, J. L. and Eccles, R. G.	1989	Price, Authority, and Trust: From Ideal Types to Plural Forms	Annual Review of Sociology
13	Cavinato, J. L.	1992	A Total Cost/Value Model for Supply Chain Competitiveness	Journal of Business Logistics
14	Christopher, M	1992	Logistics and Supply Chain Management	Book
15	Coase, R. H.	1937	The Nature of the Firm	Economica
16	Cohen, W. M. and Levinthal, D. A	1990	Absorptive Capacity: A New Perspective On Learning And Innovation	Administrative Science Quarterly
17	Coles, J. W. and Hesterly, W. S.	1998	The impact of firm-specific assets and the interaction of uncertainty: An examination of make or buy decisions in public and private hospitals	Journal of Economic Behaviour & Organization
18	Contractor, F. J. and Lorange, P.	1988	Cooperative Strategies in International Business	Book
19	Crocker, K. J. and Reynolds, K. J.	1993	The efficiency of incomplete contracts: An empirical analysis of Air Force engine procurement	The Rand journal of economics
20	Cummings, L. L.	1984	Compensation, Culture, and Motivation: A Systems Perspective	Organizational dynamics
21	Currall, S. and Inkpen, A.	2000	Interpersonal, Inter-Group, and Inter-Firm Levels	Book section
22	Dacin, M. T., Oliver, C. and Roy, J.	2007	The legitimacy of strategic alliances: an institutional perspective	Strategic Management Journal
23	David, R. J. and Han, S.	2004	A Systematic Assessment of the Empirical Support for Transaction Cost Economic	Strategic Management Journal
24	de Rond, M.	2003	Strategic Alliances as Social Facts	Book
25	de Rond, M. and Bouchikhi, H.	2004	On the Dialectics of Strategic Alliances	Organization Science
26	De Toni, A. and Nassimbeni, G.	1995	Supply networks: Genesis, stability and logistics implications. A comparative analysis of two districts	Omega
27	Di Maggio, P. J.	1986	Structural analysis of organizational fields: a block model approach	Book section
28	DiMaggio, P. J. and Powell, W. W.	1983	The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields	American Sociological Review
29	Dolan, C. and Humphrey, J.	2000	Governance and trade in fresh vegetables: Impact of UK supermarkets on the African horticulture industry	The Journal of Development Studies
30	Donaldson, T. and Preston, L. E.	1995	The stakeholder theory of the corporation: Concepts, evidence	The Academy of Management Review
31	Doz, Y. L. and Hamel, G.	1998	Alliance Advantage: The Art of Creating Value through Partnering	Book
32	Doz, Y. L., Olk, P. M. and Ring, P. S.	2000	Formation processes of R&D consortia: Which path to take? Where does it lead?	Strategic Management Journal

	Author	Year	Title	Journal
33	Dwyer, F. R. and Oh, S	1988	A Transaction Cost Perspective On Vertical Contractual Structure	Journal of Marketing
34	Dyer, J.	1996	Specialized supplier networks as a source of competitive advantage: Evidence from the auto industry	Strategic Management Journal
35	Dyer, J. H. and Singh, H.	1998	The relational view: Cooperative strategy and sources of inter-organizational competitive advantage	The Academy of Management Review International Journal of Physical Distribution & Logistics Management
36	Ellram, L. M.	1991	Life-Cycle Patterns in Industrial Buyer-Seller Partnerships	Journal of Business Logistics
37	Ellram, L. M. and Hendrick, T. E	1995	Partnering characteristics: A dyadic perspective	Journal of Business Logistics
38	Evan, W. M. and Freeman, R. E.	1983	A Stakeholder Theory of the Modern Corporation: Kantian Capitalism	Book section
39	Faulkner, D. O.	1995	International Strategic Alliances: Co-operating to compete	Book
40	Folta, T. B.	1998	Governance and uncertainty: The trade-off between administrative control and commitment	Strategic Management Journal
41	Ford, D., Hakansson, H. and Johanson, J.	1986	How Do Companies Interact?	Industrial Marketing & Purchasing
42	Freeman, L. C.	1979	Centrality in social networks: Conceptual clarification	Social Networks
43	Freeman, R. E.	1984	Strategic Management: A stakeholder approach	Book
44	Friedman, R. A.	1991	Trust, understanding and control: Factors affecting support for mutual gains bargaining in labour negotiations	Book
45	Gereffi, G.	1994	The organization of buyer-driven global commodity chains how US retailers shape overseas production networks	Book section
46	Gibbs, J. P.	1981	Norms, Deviance, and Social Control: Conceptual Matters	Book
47	Gomes-Casseres, B.	1996	The Alliance Revolution: The New Shape of Business Rivalry	Book
48	Granovetter, M.	1992	Problems of explanation in economic sociology	Book section
49	Gray, B.	1996	Cross-Sectoral Partners: Collaborative Alliances among Business, Government, and Communities	Book section
50	Gulati, R. and Zajac, E.	2000	The future of cooperative strategy	Book section
51	Gulati, R.	1998	Alliances and Networks	Strategic Management Journal
52	Gulati, R.	1995	Social structure and alliance formation pattern: A longitudinal analysis	Administrative Science Quarterly
53	Gulati, R. and Singh, H.	1998	The architecture of cooperation: Managing coordination costs and appropriation concerns in strategic alliances	Administrative Science Quarterly
54	Gundlach, G. T., Achrol, R. S. and Mentzer, J. T.	1995	The structure of commitment in exchange	Journal of Marketing
55	Håkansson, H. and Snehota, I.	1995	Developing Relationships in Business Networks	Book
56	Hamel, G.	1991	Competition for competence and inter partner learning within international strategic alliances	Strategic Management Journal
57	Hamel, G., Doz, Y. L. and Prahalad,	1989	Collaborate with Your Competitors -- and Win	Harvard business review

	Author	Year	Title	Journal
	C. K.			
58	Harrigan, K. R.	1988	Joint Ventures and Competitive Strategy	Strategic Management Journal
59	Heide, J. B.	1994	Inter-organizational governance in marketing channels	Journal of Marketing
60	Hennart, J.	1988	A Transaction Costs Theory Of Equity Joint Ventures	Strategic Management Journal
61	Hughes, J. and Weiss, J.	2007	Simple Rules for Making Alliances Work	Harvard business review
62	Huxham, C. and Vangen, S.	2005	Managing to Collaborate: The Theory and Practice of Collaborative Advantage	Book
63	Hymer, S.	1972	The Internationalization of Capital	Journal of Economic Issues
64	Inkpen, A. C. and Beamish, P., W.	1997	Knowledge, bargaining power, and the instability of international joint ventures	The Academy of Management Review
65	Inkpen, A. C. and Currall, S. C.	2004	The Coevolution of Trust, Control, and Learning in Joint Ventures	Organization Science
66	James, H. S., Jr	2000	Separating contract from governance	Managerial and Decision Economics
67	Jarillo, C.	1988	On Strategic Networks	Strategic Management Journal
68	Kale, P., Dyer, J. H. and Singh, H.	2002	Alliance capability, stock market response, and long-term alliance success: The role of the alliance function	Strategic Management Journal
69	Killing, J. P.	1988	Understanding alliances: The role of task and organizational complexity	Book section
70	Killing, J. P.	1983	Strategy for Joint Venture Success	Book
71	Kirsch, L. J.	1997	Portfolios of control modes and IS project management	Information Systems Research
72	Koenig, F. and Mellewigt, T.	2006	The Uncertainty-Governance Choice Puzzle Revisited: Theoretical Perspectives on Alliance Governance Decisions	Book section
73	Kogut, B.	1988	Joint Ventures: Theoretical and empirical perspectives	Strategic Management Journal
74	Kumar, R. and Nti, K. O.	1998	Differential learning and interaction in alliance dynamics: A process and outcome discrepancy model	Organization Science
75	Lambert, D. M., Emmelhainz, M. A. and Gardner, J. T.	1996	Developing and Implementing Supply Chain Partnerships	International Journal of Logistics Management,
76	Larson, A.	1992	Network Dyads in Entrepreneurial Settings: A Study of the Governance of Exchange Relationships	Administrative Science Quarterly
77	Laumann, E. O., Galskeiwicz, L. and Marsden, P. V.	1978	Community Structure as Inter-organizational Linkages	Annual Review of Sociology
78	Lenox, M. J. and Nash, J.	2003	Industry self-regulation and adverse selection: a comparison across four trade association programs	Business Strategy and the Environment
79	Lewin, J. E. and Johnston, W. J.	1997	Relationship marketing theory in practice: A case study	Journal of Business Research
80	Li, S. X. and Rowley, T. J.	2002	Inertia and evaluation mechanisms in inter-organizational partner selection: Syndicate formation among U.S. investment banks	Academy of Management Journal
81	Lincoln, J. R., Gerlach, M. L. and Takahashi, P.	1992	Keiretsu Networks in the Japanese Economy: A Dyad Analysis of Intercorporate Ties	American Sociological Review

Author	Year	Title	Journal
82 Lorenzoni, G. and Lipparini, A.	1999	The leveraging of interfirm relationships as a distinctive organizational capability: A longitudinal study	Strategic Management Journal
83 MacNeil, I.	1981	Economic analysis of contractual relations	Northwestern University Law Review
84 Macneil, I. R.	1980	The New Social Contract, An Inquiry into Modern Contractual Relations	Book
85 Madhok, A. and Tallman, S. B.	1998	Resources, transactions and rents: Managing value through interfirm collaborative relationships	Organization Science
86 McCutcheon, D. S. I.	2000	Issues in the choice of supplier alliance partners	Journal of Operations Management
87 Metcalf, L. E., Frear, C. R. and Krishnan, R.	1992	Buyer-Seller Relationships: An Application of the IMP Interaction Model	European Journal of Marketing
88 Mintzberg, H.	1979	The Structuring of Organizations	Book
89 Mintzberg, H.	1983	The case for corporate social responsibility	Journal of Business Strategy
90 Morgan, K. and Murdoch, J.	2000	Organic vs. conventional agriculture: Knowledge, power and innovation in the food chain	Geoforum
91 Mowery, D. C., Oxley, J. E. and Silverman, B. S.	1996	Strategic alliances and interfirm knowledge transfer	Strategic Management Journal
92 Nohria, N. and Garcia-Pont, C.	1991	Global Strategic Linkages and Industry Structure	Strategic Management Journal
93 O'Reilly, C., III and Chatman, J.	1986	Organizational Commitment and Psychological Attachment: The Effects of Compliance, Identification, and Internalization on Prosocial Behaviour	The Journal of applied psychology
94 Ouchi, W. G.	1979	A Conceptual Framework for the Design of Organizational Control Mechanisms	Management Science
95 Parkhe, A.	1993	Messy' Research, Methodological Predispositions, and Theory Development in International Joint Ventures	Academy of Management Review
96 Parkhe, A.	1993	Strategic alliance structuring: A game theoretic and transaction cost examination of interfirm cooperation	Academy of Management Journal
97 Peteraf, M.	1993	The Cornerstones of Competitive Advantage: A Resource Based View	Strategic Management Journal
98 Pfeffer, J. and Salancik, G.	1978	The External Control of Organizations	Book
99 Polanyi, K.	1957	The economy as an instituted process; Trade and Market in the Early Empires: Economies in History and Theory	Book section
100 Ponte, S.	2002	Standards, Trade and Equity: Lessons from the Specialty Coffee Industry	Publication
101 Porter, M. E.	1998	Clusters and the new economics of competition	Harvard business review
102 Porter, M. E.	1985	Competitive Advantage: Creating and Sustaining Superior Performance	Book
103 Porter, M. E.	1980	Competitive Strategy	Book
104 Powell, W. W., Koput, K. W. and Smith-Doerr, L.	1996	Inter-organizational collaboration and the locus of innovation: Networks of learning in biotechnology	Administrative Science Quarterly
105 Reuer, J. J.	2004	Strategic Alliances: Theory and Evidence	Book

	Author	Year	Title	Journal
106	Reuer, J. J. and Ariño, A.	2002	Contractual renegotiations in strategic alliances	Journal of Management Strategic Management Journal
107	Reuer, J. J. and Ariño, A.	2007	Strategic alliance contracts: dimensions and determinants of contractual complexity	Journal of Management Strategic Management Journal
108	Ring, P. M. and Van de Ven, A.	1989	Formal and informal dimensions of transaction	Book section
109	Roberts, S.	2003	Supply Chain Specific? Understanding the Patchy Success of Ethical Sourcing Initiatives	Journal of Business Ethics
110	Rugman, A. M. and Verbeke, A.	2003	Extending the theory of the multinational enterprise: Internalization and strategic management perspectives	Journal of International Business Studies
111	Salk, J. E.	2005	Often called for but rarely chosen: alliance research that directly studies process	European Management Review
112	Scanzoni, J.	1979	Social Exchange and Behavioural Interdependence	Book section
113	Senge, P. M., Dow, M. and Neath, G.	2006	Learning together: new partnerships for new times	Corporate Governance
114	Shah, R. H. and Swaminathan, V.	2008	Factors influencing partner selection in strategic alliances: the moderating role of alliance context	Strategic Management Journal
115	Shapiro, D. L., Sheppard, B. H. and Cheraskin, L.	1992	In theory: Business on a handshake	Negotiation Journal
116	Spekman, R. E., Kamauff, J. W. J. and Myhr, N.	1998	An empirical investigation into supply chain management: a perspective on partnerships	Supply Chain Management Journal of Economic Behaviour and Organization
117	Teece, D.	1992	Competition, Cooperation, and Innovation: Organizational Arrangements for Regimes of Rapid Technological Progress	California management review
118	Teece, D. J.	1998	Capturing value from knowledge assets: The new economy, markets for know-how, and intangible assets	California management review
119	Tong, T. W. and Reuer, J. J.	2007	Real Options in Strategic Management'	Book section
120	Verbeke, Alan M Rugman and Alain	2004	A perspective on regional and global strategies of multinational enterprises	Journal of International Business
121	Viaar, P. W. L., van gen Bosch, Frans A.J. and Volberda, H. W.	2006	Coping with Problems of Understanding in Inter-organizational Relationships: Using Formalization as a Means to Make Sense	Organization Studies
122	Vlaar, P., Van Den Bosch, Frans A. J. and Volberda, H. W.	2006	Inter-organizational Governance Trajectories: Towards a Better Understanding of the Connections Between Partner Selection, Negotiation and Contracting	Book section
123	Walker, G., Kogut, B. and Shan, W.	1997	Social capital, structural holes and the formation of an industry network	Organization Science
124	Webster, F. E. J.	1992	The Changing Role of Marketing in the Corporation	Journal of Marketing,
125	Weick, K. E.	1995	Sense-making in organizations	Book
126	Weick, K. E., Sutcliffe, K. M. and Obstfeld, D.	2005	Organizing and the Process of Sense-making	Organization Science
127	Wheeler, D., Colbert, B. and Freeman, E. R.	2003	Focusing on value: Reconciling corporate social responsibility, sustainability and a stakeholder approach in a network world	Journal of General Management
128	Williamson, O. E.	1991	Comparative economic organization: the analysis of discrete structural alternatives	Administrative Science Quarterly

	Author	Year	Title	Journal
129	Williamson, O. E.	1985	The Economic Institutions of Capitalism	Book
130	Williamson, O. E.	1979	Transaction-Cost Economics: The Governance of Contractual Relations	Journal of Law & Economics
131	Williamson, O. E.	1975	Markets and Hierarchies	Book
132	Wilson, D. T.	1995	An integrated model of buyer-seller relationships	Academy of Marketing Science Journal
133	Yoshino, M. Y. and Rangan, U. S.	1995	Strategic alliances: An entrepreneurial approach to globalization	Book

6.5 Systematic Literature Review: Data extraction form sample

Referred to in Section 2.5.2 (p.75)

Author	Year	Title	Abstract	Type of paper	Method for data collection	Sample	Journal
1 Achrol	1997	Changes in the Theory of Interorganizational Relations in Marketing: Towards a Network Paradigm	Stern and Reve (1980) proposed a political economy framework for comparatively analyzing marketing channels on the basis of channel dyads' internal economy and sociopolitical structures and processes. Their framework is extended to incorporate the external environmental factors that affect the structure and processes of channel dyads. The environment of marketing channel dyads is made up of the primary-, secondary-, and macro-task environments. The primary-task environment includes the dyad's immediate suppliers and customers, which is affected by the secondary-task environment, including suppliers of immediate suppliers and customers of immediate customers. The macro-task environment is made up of general social, political, economic, and technological forces. The primary and secondary environments are further divided into input, output, competitive, and regulatory sectors. The framework allows analysis of how environmental resource scarcity, heterogeneity, instability, and turbulence affect marketing channel dyads.	Conceptual			Journal of Marketing
2 Adobor	2006	The role of personal relationships in inter-firm alliances: Benefits, dysfunction, and some agreements	Strategic alliances have become an important means for developing and improving a firm's level of competitiveness. Although attractive, alliances are risky and difficult to manage. One crucial mechanism in managing and reducing alliance risk is reliance on personal relationships between managers in partnering firms. Personal ties are beneficial in that they can form the basis for developing trust between partners, and aid joint decision-making and information sharing, thereby reducing some of the risks inherent in alliances. Despite their usefulness, however, personal relationships may have drawbacks. For example, strong interpersonal ties in alliances can sometimes prevent dissolution of faltering arrangements, as feelings may prevent the making of difficult, yet prudent, termination decisions. In order to combat this possibility, firms can reduce the downside of personal relationships by carefully managing the role of performance managers across the life of the relationship.	Conceptual			Business horizons
3 Ahuja	2000	Collaboration Networks, structural holes, and Innovation: A longitudinal study	To assess the effects of a firm's network of relations on innovation, this paper elaborates a theoretical framework that relates 3 aspects of a firm's ego network - direct ties, indirect ties, and structural holes - to the firm's subsequent innovation output. Results from a longitudinal study of firms in the international chemicals industry indicate support for the predictions on direct and indirect ties, but in the inter-firm collaboration network, increasing structural holes has a negative effect on innovation.	Conceptual - Empirical	Secondary data analysis	268 joint ventures from 97 chemical industry firms	Administrative Science Quarterly
4 Anand and Khanna	2000	Do firms learn to create value? The case of alliances	Whether firms learn to manage interfirm alliances as experience accumulates is investigated. Contract-specific experience measures in a data set of over 2000 joint ventures and licensing agreements, and value creation measures derived from the abnormal stock returns surrounding alliance announcements are used. Learning effects are identified from the effects of unobserved heterogeneity in alliance capabilities. Evidence of large learning effects in managing joint ventures, but no such evidence for licensing contracts, is found. The effects of learning on value creation are strongest for research joint ventures, and weakest for marketing joint ventures. These results are consistent with the view that learning effects are more important in situations characterized by greater contractual ambiguity.	Conceptual - Empirical	Secondary data analysis	870 joint ventures and 1156 licenses	Strategic Management Journal

Author	Year	Structure/Activities/Elements	Governance Mechanisms	Key Findings
1 Achrol	1997			
2 Adobor	2006			Kinds of power compatible with network relationships and the manner in which power is exercised. In dyadic relationships the power to coordinate is the prerogative of dominant firms over dependent firms: whether it to maximize system outputs or opportunistically, the power relationship is a manipulative one. The kinds of power compatible with network relations have less to do with authority and traditional carrot-and-stick approaches. Power consistent with interorganizational influence in networks build social bonds and close relationships, that is expert, reputational and referent types of power. But expertise has to be constantly regenerated, reputational and referent power are elusive qualities to capture. Important is the "sense of belonging". How power is employed. Power in networks is a subtle force, exercised via processes of socialization, peer review and consensus, not executive fiat.
3 Ahuja	2000	Collaborative linkages represent arenas of sustained, focused, and relatively intense interaction (Auster, 1992). They involve repeated and regular meetings between the partners, a focus on specified objectives, and entail coordination, close contact, and mutual dependency (Gulati and Singh, 1998). Extensive relations between partners can foster the development of shared norms of behavior and explicit interorganizational knowledge-sharing routines (Juzzi, 1997; Walker, Koqut, and Shan, 1997; Dyer and Nobeoka, 2000)		
4 Anand and Khanna	2000			

Author	Year	Influence factors	Impact
1 Achrol	1997		Benefits and limits to relying on strong interpersonal relationships. Greater need for personal relations in the earlier parts of the relationship than in the later stages. Personal trust increases relationship assets and helps reduce relational risk. Downsides of personal ties are conflict of interest, personal relations and escalation of commitment, fate of alliance gets tied to personal relationship and agency and transaction costs of relationship increase
2 Adobor	2006	Commitment and interdependence. Two important components of commitment, attitudinal and instrumental (Gundlach, Achrol and Mentzer, 1995). Attitudinal related to affective commitment, psychological attachment and value congruence (Allen and Meyer 1990; O'Reilly and Chatman 1996). Instrumental has to do with the "side bets", pledges, credible commitments and idiosyncratic investments, refer to the allocation of resource that become specific or dedicated to a relationship (Anderson and Weitz 1992; Williamson 1985). Trust in a relationship reduces the development of opportunistic intentions and thus eliminates the need for structural mechanisms of control (Graonvetter 1985). Trust is connected to risk (the willingness to become vulnerable), a leap of faith, a self-regulating verification system. Trust is reinforced by the manner in which interfirm interactions are organized and conducted. Satisfactory conflict resolution will increase mutual trust and reinforce each member's commitment and confidence (Thorelli, 1986).	
3 Ahuja	2000		
4 Anand and Khanna	2000	Capacity to manage a complex organization is tacit, costly to develop and hard to imitate. Difficulties of transferring tacit know-how (Winter, 1986; Szulanski, 1996) are likely to be more pronounced in an intrafirm setting (Baker, Gibbons, and Murphy, 1997). Tension between cooperation and competition within alliances (Hamel, 1991; Gulati, Khanna and Nohia, 1994). "Alliance capability" enhances probability of success: formal systems in place to capture the experience from each alliance, a central admin entity to coordinate multiple alliances and maintaining corporate data bases and newsletter on alliances activity. Learning effects are stronger in joint ventures than for licensing contracts (greater ambiguity), learning effects higher in R&D joint ventures than in production or marketing joint ventures	

Author	Year	Relationship "modal"	Process / Dynamics
1 Achrol	1997		
2 Adobor	2006	Four types of network organization: Internal market, vertical market, Intermarket (keiretsu) and opportunity market. Most of the examples based on keiretsu	
3 Ahuja	2000	Direct and indirect ties have a positive impact on innovation but the impact of indirect ties is moderated by the number of a firm's direct ties. Structural holes have negative influences on innovation. Optimal structure of interfirm networks depends on the objectives of the network members.	
4 Anand and Khanna	2000		

Author	Year	Title	Abstract	Type of paper	Method for data collection	Sample	Journal
5 Anderson and Weitz	1992	The use of pledges to build and sustain commitment in distribution channels	Commitment in channel relationships is modeled as a function of: 1. each party's perception of the others' commitment, 2. self-reported and perceived pledges (idiosyncratic investments and contractual terms) made by each party, and 3. such factors as communication level, reputation, and relationship history. A dyadic model represented by a simultaneous equation system is estimated with data from 378 pairs of manufacturers and industrial distributors. The results indicate that one type of pledge - idiosyncratic investments - has a strong effect on the commitment of both parties to the relationship. Additionally, each party's commitment is affected by the perceived commitment of the other party. Idiosyncratic investments signal commitment, affecting each party's perceptions of the other party's commitment.	Conceptual / Empirical	Survey	378 pairs of manufacturers and industrial distributors	JMR, Journal of Marketing Research
6 Argenti	2004	Collaborating with activists: How Starbucks works with NGOs	This article analyzes the company's ultimate decision to sell Fair Trade coffee and subsequently work with other NGOs to ensure that small farmers receive a living wage. In an effort to live up to the standards Starbucks set for itself in the area of social responsibility, this article provides a brief overview of the changing environment for corporations and NGOs. It discusses the battle between Global Exchange and Starbucks over Fair Trade, including factors that led to the confrontation between Global Exchange and Starbucks, Starbucks' alternatives in the face of Global Exchange's threat, Starbucks' decision, and ensuing events. This article also presents collaboration as a growing and important alternative to confrontation in business-NGO relations and offers seven lessons managers can take away from Starbucks' experience.	Empirical	Case Study	1 company-NGO relationship	California management review
7 Arifo and de la Torre	1998	Learning from Failure: Towards an evolutionary model of collaborative ventures	A report on a longitudinal case study of the interaction between 2 partners to a failed international joint venture is presented. A model of the collaboration process in partnership and alliances is developed based on earlier work by Ring and Van de Ven (1994) and by Doz (1995). A series of events that occurred in the course of the relationship are employed as the unit of analysis in order to trace the interactions between the partners, and to explicate the impact that external shocks have on their perceptions of efficiency and equity. The impact of these events, as well as the responses they elicit, on the quality of the relationship (and vice versa) are also considered. It is found that the partners' assessments cause them to either engage in renegotiation of the terms of the contract, or to modify their behavior unilaterally. In an attempt to restore balance to the relationship, the process feeds back until a new mutual understanding of equity is restored, or else the relationship deteriorates gradually until a point when the venture is dissolved.	Empirical	Case Study	1 failed joint venture	Organization Science
8 Arifo et al.	2005	Relational quality : Managing trust in corporate alliances	Management scholars have often argued that "trust" plays a key role in economic exchanges, particularly when one or another party is subject to the risk of opportunistic behavior and incomplete monitoring or when problems due to moral hazard or asymmetric information arise. These conditions are almost always present in the case of corporate alliances and joint ventures. However, one attribute of relationships - "relational quality" - is fundamental to the maintenance of good working conditions in two-party alliances where past experience and the shadow of the future play important roles. Relying on a growing body of theory and a number of case studies, this article develops a framework for thinking about trust in dynamic and practical terms. It also provides recommendations for managing relational quality in alliances as a strategy for enhancing value.	Conceptual			California Management Review
9 Arifo et al.	2005	Relational quality and Inter-personal trust in strategic alliances		Conceptual			European Management Review
10 Artz	1999	Buyer-Supplier Performance: The role of Asset specificity ...	This paper argues that the extent and balance of transaction specific assets, and the presence of relational norms in a buyer-supplier relationship are important factors affecting partnership performance. Hypotheses were tested using data from 353 manufacturing firms. Results revealed that while specific investments by one participant in the relationship negatively impacted the indicators of performance, offsetting investments by the other party effectively increased performance. Relational-exchange elements* were positively related to performance.	Empirical	Survey	353 purchase man	British Journal of Management

	Author	Year	Authors' Institution Geography	Geography	Context	Motivations
5	Anderson and Weitz	1992	US	US		
6	Argenti	2004		Global		NGO Global Exchange posed a credible threat and would pursue its campaign until Starbucks relented and Integrated Fair Trade Coffee
7	Ariño and de la Torre	1998	Europe, US	US- Europe		The value that a firm expects to gain from an alliance depends on its current strategy, its expectation about future environmental conditions, its own planned contributions as well as those it expects from its partner to the alliance, and on the negotiated distribution rules that will apply to future benefits.
8	Ariño et al.	2001				
9	Ariño et al.	2005				
10	Artz	1999				

	Author	Year	Structure/Activities/Elements	Governance Mechanisms	Key Findings
5	Anderson and Weitz	1992			Commitment to a relationship implies the adoption of a long-term orientation toward the relationship - a willingness to make short-term sacrifices to realize long-term benefits from the relationship (Dwyer, Schurr, and Oh 1987). Pledges are actions undertaken that demonstrate good faith and bind the members to the relationship. Two types of pledges: idiosyncratic investments (specific to a channel relationship such as training or dedicating personnel, and contractual terms.
6	Argenti	2004			
7	Ariño and de la Torre	1998			
8	Ariño et al.	2001			
9	Ariño et al.	2005			
10	Artz	1999			

	Author	Year		
			Influence factors	Impact
5	Anderson and Weitz	1992	One type of pledge, Idiosyncratic Investments, has a strong effect on the commitment of both parties to the relationships. In addition, each party's commitment is affected by the perceived commitment of the other party. Idiosyncratic Investments signal commitment, affecting each party's perceptions of the other party's commitments	
6	Argenti	2004	Starbucks had problems with quality of Fair TradeCoffee suppliers	
7	Ariño and de la Torre	1998	Positive feedback loops are critical in the evolutionary process, relationship quality is both an outcome and a mediating variable, and procedural issues are critical from the start in fostering a climate for positive reinforcement and the building of mutual trust and confidence in the relationship. Relational quality depends partly on the personal bonds between key executives, on their trust in each other, and on the broader reputation the partners have for fair dealing (Josmer 1995, Zaheer and Venkatraman 1995, Ring 1996). Procedural solutions for conflict resolution may be an important aspect of initial conditions. The existence of such procedures may influence the choice between the partners negotiating their differences or their undertaking unilateral action, building the store of trust and goodwill necessary for long term success.	
8	Ariño et al.	2001		
9	Ariño et al.	2005		
10	Artz	1999	Indicators of performance: transaction costs, delivery performance and relationship satisfaction. OEM specific assets will be negatively related to buyer-supplier performance. Reciprocal Investments in specific assets by the supplier will positively impact relationship and buyer-supplier performance. Collaboration is positively correlated to performance	

	Author	Year		
			Relationship "modal"	Process / Dynamics
5	Anderson and Weitz	1992		
6	Argenti	2004	Program with Oxfam, State Coffee Producers Networks and Ford Foundation. Starbucks and Ford Foundation provide financial support for partnership. Objective to increase supply of high-quality certified fair trade coffee, improve the skills of coffee farmers, provide info and support farmers to earn premium	
7	Ariño and de la Torre	1998		External shocks impact partners perception on efficiency and equity. Impact of these events and the responses they elicit on the quality of the relationship are also considered. Partners' assessments cause them to either engage in renegotiation of the terms of the contract, or to modify their behavior unilaterally, in an attempt to restore balance to the relationship. The process feeds back until a new mutual understanding of equity is restored, or else the relationship deteriorate gradually until a point when the venture is dissolved.
8	Ariño et al.	2001		
9	Ariño et al.	2005		
10	Artz	1999		

6.6 Appendix: Project 2 – Interview informants

Central level

	Organization	Responsibility
1	Nespresso	Green Coffee Head
2	Nespresso	International Marketing
3	Nespresso	Ex-Green Coffee Head
4	Nespresso	Green Coffee
5	Nespresso	Project Manager
6	FNC	European Office
7	SAN - RFA	Central America
8	SAN - RFA	RFA – General/ Agriculture
9	Volcafé	Project Manager
10	Nespresso	Sustainability
11	Expocafé	European Office
12	Expocafé	European Office
13	Nespresso	Quality
14	Nespresso	Communications
15	Neumann	EDE Consulting (NKG)
16	Nespresso	Ex-CEO (until 2007)
17	International Finance Centre	Central America (Position?)
18	FNC	Multi-lateral organizations

Project level -Costa Rica

	Organization	Responsibility
1	Nespresso	Project coordinator
2	Nestlé	Country Head
3	Ecom	General Manager
4	Ecom	Manager La Giorgia
5	Ecom	Manager Orosi
6	Ecom	Agronomist
7	Volcafé	Manager
8	Producer	La Giorgia
9	Producer	La Giorgia
10	Producer	Orosi
11	Producer	Orosi

Project level -Colombia

	Organization	Responsibility
1	Nespresso	Project coordinator
2	FNC	Specialty coffees coordinator
3	Expocafé	Agronomist
4	FNC - Cauca	Executive Director
5	FNC - Cauca	Specialty coffees coordinator
6	Almacafé	Coordinator
7	Cooperative -Cauca	G. Manager
8	Technoserve	Coordinator
9	Neumann	SKN Caribe - Gen. Manager
10	SAN - RFA	Fundación Natura
11	Cooperative - Supia	General Manager
12	Cooperative - Supia	Extensionist
13	Cooperative - Supia	Extensionist-Quality

14	Producer	Cauca
15	Producer	Cauca
16	Producer	Supia
17	Producer	Supia

Project level -Brazil

	Organization	Responsibility
1	SAN-RFA	Brazil - Imaflora
2	Cooperative	Cooxupé

6.7 Appendix: Project 2 - Interview Protocol

Referred to in Section 1.6.4, Section 3.4.1, Section 3.4.3, Section 4.4.4

6.7.1 Interview guideline

SUSTAINABLE SOURCING NETWORKS: DYNAMICS OF COOPERATION IN THE SPECIALTY COFFEE SEGMENT: **Roaster**

Intro Introduction

Objectives for the interview

Confidentiality, Permission to record interview

1 **Could you briefly describe your role in the company and the extent of your involvement in the AAA Programme?**

2 **What are the main benefits and costs of the programme?**

For Nespresso as a whole

For your function

For other stakeholders (that you are in contact with)?

3 **What is your perspective on how the programme was initiated?**

Why? How?

What were the key objectives when the programme was started?

What do you consider were the key activities?

From your perspective, what were the main opportunities and risks offered by this programme?

Were you present in the initial selection and negotiation with stakeholders? If so, what were the key criteria to choose them, how did the negotiation occur?

What worked well during that time and what could have been better?

How did the programme relate initially to your functional responsibilities?

4 **What are the main activities and coordination mechanisms of the programme initially?**

What were the activities that the programme focused on initially?

How was the programme managed? What were the coordination tools used? Who decided what? How did you communicate with other organizations?

5 **How has the programme evolved since then?**

How did you see the programme evolution in terms of the expansion of projects, actors and activities? What went well, what was key to get to where the programme is today? What could have been done differently?

How did the coordination and communication mechanisms evolve over time?

Did your role or your interaction with the programme evolve as well?

6 **What are the factors that have influenced the results of the programme?**

7 **Looking into the future, what do you think are the areas where Nespresso should focus its efforts?**

Which areas of the programme have the potential to create significant value?

Are there new areas that should be incorporated?

What areas/activities do you think need to stop?

How do you see the programme evolving in the future?

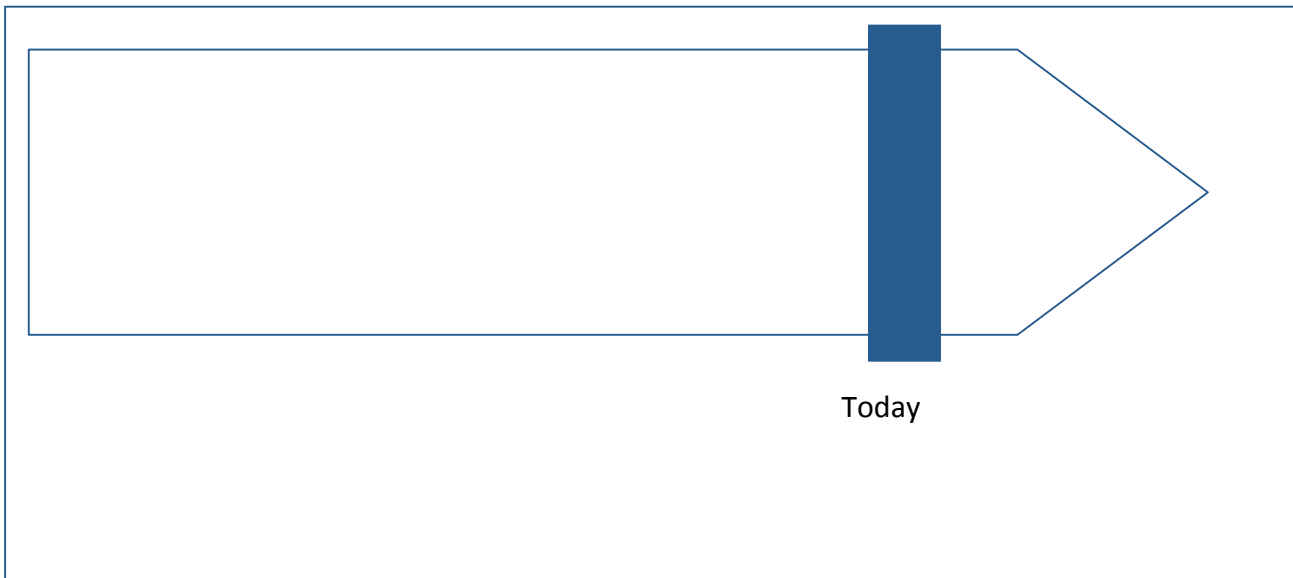
What are the key challenges ahead?

Thank you very much!

6.7.2 Interview chart - Timeline

CHART 1: AAA SUSTAINABLE QUALITY PROGRAM: Defining moments in time

What have been the key defining moments of the programme thus far and which ones do you think will be the key ones in the future?



6.7.3 Interview chart – Enhancers and Inhibitors

CHART 2: PROGRAM’S ENHANCERS AND INHIBITORS

In which way do you think the following factors have influenced the outcome of the programme?

(1= Very negatively, 2= somewhat negatively, 3=Neutral, 4=somewhat positive, 5=Very positive)

	In the creation of the programme 2003-04	Today	Comments
Selection of countries where to run the programme			

	In the creation of the programme 2003-04	Today	Comments
Pre-existing relationships with stakeholders in these countries			
Formal/Informal relationships between Nespresso and traders			
Formal/Informal relationships between Nespresso and NGOs			
Formal/Informal relationships between traders and NGOs			
Relationships with international organizations (ex. IFC)			
Relationships with other experts/consultants (specify)			
High level support of the project in Nespresso			
High level support of the project in stakeholder organizations (specify)			
Structured processes for negotiation			
Informal processes for 'getting to know each other'			
Clear procedures, responsibilities, task assignments and conflict resolution			
Clear idea of costs and benefits of the programme for each stakeholder			
Formal leaders of the process			
Informal leaders of the process			
Others: _____			
Others: _____			

6.7.4 Farm questionnaire

**PROGRAMAS DE SOSTENIBILIDAD EN LA INDUSTRIA DE CAFÉ ESPECIAL
CON MULTIPLES STAKEHOLDERS: Productores**

Datos de la finca: Nombre propietario: Edad: Area total : _____ Ha Area cultivada de café: _____ Ha Altitud: Productividad: _____ (fanegas/ha?) Densidad: _____ plantas/ha Fertilización (química / orgánica): Pesticidas: Sombra: Edad plantación: <5 años ____% 5-15 años ____% >15 años ____% Tiene trabajadores?
--

1) Cuáles considera han sido las mejoras mas importantes en su finca desde 2003 ?

Pregunta general, se espera que el productor identifique las áreas que a su juicio fueron mas importante. Si es necesario, se pueden dar ejemplos como 'mejoras de producción, uso de fertilizantes, uso de sombra, comercialización, etc...)

2) En qué áreas ha tenido los mayores problemas?

3) Que fuentes de información utiliza frecuentemente en relación al cultivo de café?

	Nunca	A veces	Seguido	Ejemplos
Diarios / Revistas				
Radio				
Familia / Amigos				
Eventos de capacitación				
Conversación con agrónomos/ Expertos				
Otro: _____				
Otro: _____				

--	--	--	--	--

4) Ha recibido visitas de expertos a su finca? Que tan frecuentemente?

5) Que es lo mas útil de éstas visitas?

6) Que recomendaría a futuro?

7) Asistió a eventos de capacitación en los últimos dos años? Cuantos? Cuales?

8) Participó en algún otro proyecto especial organizado por el exportador?

9) Que opinión le mereció el proyecto?

10) Que conoce sobre el programa Nespresso AAA Calidad Sostenible?

11) Cuáles son los aspectos que considera positivos en el programa?

12) En qué áreas sugeriría enfocar el programa a futuro en su región?

6.8 Appendix: Project 2 - Coding

Referred to in 1.6.5, Section 3.4.1, Section 3.4.4, Section 4.4.4, Section 4.4.5, Section 4.4.7

6.8.1 Additional information on coding process

Initial coding

Nespresso Case Study – Initial coding
June 16, 2008

Three parallel types of coding will be done on the existing data (interviews and documents) using the variables used in the Research Project Protocol, following what Miles and Huberman (1994) propose as a starting point for codifying data. The three types of coding will be:

From proposed framework:

Category	Code	Definition
Context	External macro context	Macro-economic, political and industry conditions surrounding the program. It includes industrywide events as well as consumer, media, NGO activities and government actions
	Actors Overall Strategy	Actions or statements relating to broad strategic choices made by an organization, ex. new markets, products, aspirations, leadership changes
	Actors motivations/expectations	Rationale to seek the establishment or expansion of relationship among two or more actors
	Other ties between organizations	Other relationships established by the organization with third parties (enterprises, NGOs, governments, etc.) independently of the Nespresso AAA program
Negotiation	Informal	Attraction, communication, informal bargaining among actors
	Formal contracts, agreements	Establishment of formal contracts or other forms of contractual type of agreement
Conditions	Program Tasks and activities	Activities related to the operation of the program including information sharing, knowledge capture, infrastructure, education, etc.
	Unilateral actions	Actions decided unilaterally by one of the actors in the relationship that may have an effect on other actors
	Formal governance mechanisms	Formal planning, budgeting and reporting activities
	Informal coordination mechanisms	Informal communication, encounters, e-mails, face to face informal interaction

	Resources	Financial and human resources allocation to activities related to the AAA program
Results	Results	Key Performance Indicators (general or per actor). Results against these indicators or general results
Assessment	Sense-making by individual actors	Reflections made by individuals or by organizations with regards to the equity or efficiency of the program.
	Shared assessment	Shared assessments of areas of challenges and opportunities for the AAA program

Chronological:

Category	Code	Definition
Before 2002, 2003, 2004, 2005, 2006, 2007	External events	Macro events impacting at an industry, country level
Before 2002, 2003, 2004, 2005, 2006, 2007	Relationship events	Dyadic or multi-actor events occurring at the level of the AAA relationship
Before 2002, 2003, 2004, 2005, 2006, 2007	Organization and individual events	Events occurring within one of the organizations or relating specifically to an individual within that organization

Linkages:

Category	Code	Definition
Linkages	Inter-organizational linkages (in program)	Creation, strengthening, weakening and/or dissolution of ties among organizations in the AAA program
	Inter-personal linkages	Creation, strengthening, weakening and/or dissolution of ties among individuals in the organizations involved in the AAA program
	Other ties between organizations	Creation, strengthening, weakening and/or dissolution of ties between organizations in the AAA program with OTHER organizations that are not part of AAA program or relationships within organizations that go beyond the AAA program

Compared coding – Two interviews

From Framework - 1 Interview Coded - -

Intvw	CE-NN-1-AR	Coder 1	Coder 2
	References Included	71	57
	Eliminated after review	19	1
	Remaining references	52	56

	Identical references		13	
	Referenced under different code		28	
	Added or changed coding	23		38
Intvw	CE-EX-4-NR			
	References Included	74		75
	Eliminated after review	19		9
	Remaining references	55		66
	Identical references		29	
	Referenced under different code		8	
	Added or changed coding	24		21

6.8.2 Coding by coder

Central level			Project level -Costa Rica		
	Organization	Coder		Organization	
1	CE-NN-5-KR	AB			
2	CE-NN-8-OQ	AB	1	LO-NN-11-JD1	GA
3	CE-NN-8-OG	GA	2	LO-NN-11-DF	AB
4	CE-NN-4-JM	GA	3	LO-EX-11-CA	GA
5	CE-NN-7-PB	AB	4	LO-EX-13-TS	AB
6	CE-EX-4-NR	GA, AB	5	LO-EX-12-MO	GA
7	CE-NG-2-RS	AB	6	LO-EX-14-TJ	GA
8	CE-NG-1-CW	AB	7	LO-EX-15-EC	GA
9	CE-EX-7-MF	GA, AB	8	LO-FA-13-LG	GA
10	CE-CN-1-DS	GA	9	LO-FA-14-LG	GA
11	CE-EX-2-JCA	GA	10	LO-FA-12-DRO	AB
12	CE-EX-1-JO	AB	11	LO-FA-11-CO	AB
13	CE-NN-1-AR	GA, AB			
14	CE-NN-3-HJR	GA			
15	CE-EX-6-JT	AB			
16	CE-NN-2-GB	AB			
17	CE-ML-1-JGF	GA			
18	CE-EX-3-AM	AB			
Project level -Colombia			Project level -Brasil		
	Organization			Organization	
1	LO-NN-21-SA	AB	1	LO-NG-31-ET	GA
2	LO-EX-22-CAG	GA	2	LO-EX-31-C-J	GA
3	LO-EX-21-MR	GA			
4	LO-EX-23-CS	GA			
5	LO-EX-24-CB	AB			
6	LO-CO-21-FE	GA			
7	LO-CO-22-AOH	AB	Coded by:	GA	28
8	LO-CN-21-ES	GA		AB	19
9	LO-EX-27-LM	GA		GA+AB	3
10	LO-NG-21-LB	AB	Total:		48
11	LO-CO-23-GM	GA			
12	LO-EX-28-Ext	GA			
13	LO-EX-28-Ext	GA			
14	LO-FA-21-Prod	GA			
15	LO-FA-22-Prod	GA			
16	LO-FA-23-Prod	AB			
17	LO-FA-24-Prod	AB			

6.8.3 Sources coded













Documents

Name	Nodes	References
JA-1-Agreement with Brazil suppli	3	5
JA-2-Anonymous AAA commitme	8	66
JA-3-Nespresso RA activities 1pg	4	7
JA-4-Nespresso RA MDU Version	4	5
NR-1-Achievements news	3	4
NR-2-Ixthuplan project	0	0
NR-3-News_Release_2006_Cost	4	4
NR-4-News_Release_2006_Miles	3	3
NR-5-News_Release_2010_Com	3	4
NR-6-News_Release_Awards_Afr	1	1
NR-7-Project_Report_Caldas	2	3
NR-8-Project_Report_San_Ramo	3	3
NR-9-TASQ_Factsheet	1	1
SR-1-Stakeholder_Forum_Report	3	4
SR-2-2007 Stakeholder Nespress	18	42
















Central

Name	Nodes	References
CE-CN-1-DS	15	59
CE-EX-1-JO	18	37
CE-EX-2-JCA	25	108
CE-EX-3-AM	8	13
CE-EX-4-NR	23	61
CE-EX-5-MF	14	36
CE-EX-6-JT	13	29
CE-EX-7-MF	21	47
CE-ML-1-JGF	13	28
CE-NG-1-CW	13	23
CE-NG-2-RS	13	28
CE-NG-2-RS (2)	1	2
CE-NN-1-AR	24	96
CE-NN-2-GB	12	26
CE-NN-3-HJR	11	31
CE-NN-4-JM	4	4
CE-NN-5-KR	23	49
CE-NN-6-OG	21	65
CE-NN-7-PB	17	38
CE-NN-8-OQ	9	17



Costa Rica

	Name	Nodes	References
	LO-EX-11-CA	20	87
	LO-EX-12-MO	11	23
	LO-EX-13-TS	8	17
	LO-EX-14-TJ2JD3	3	11
	LO-EX-15-EC	7	24
	LO-FA-11-CO	3	3
	LO-FA-12-DRO	8	11
	LO-FA-13-Prod La Giorgia	4	7
	LO-NN-11-DF	7	17
	LO-NN-12-JD1	10	37
	LO-NN-13JD2	3	3
	LO-NN-14JD4	2	2

Colombia

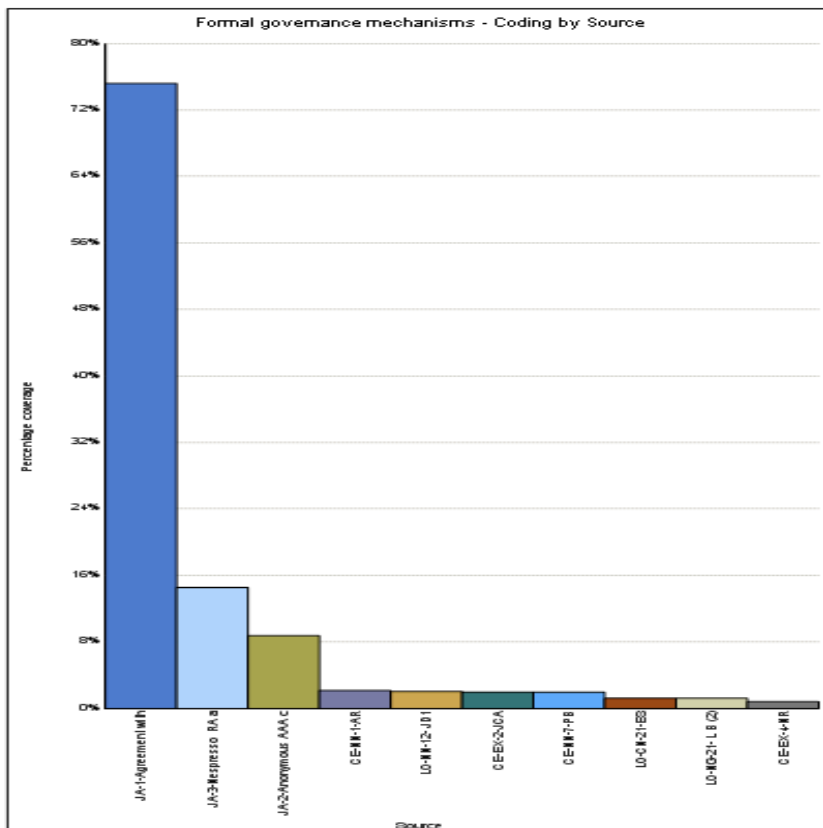
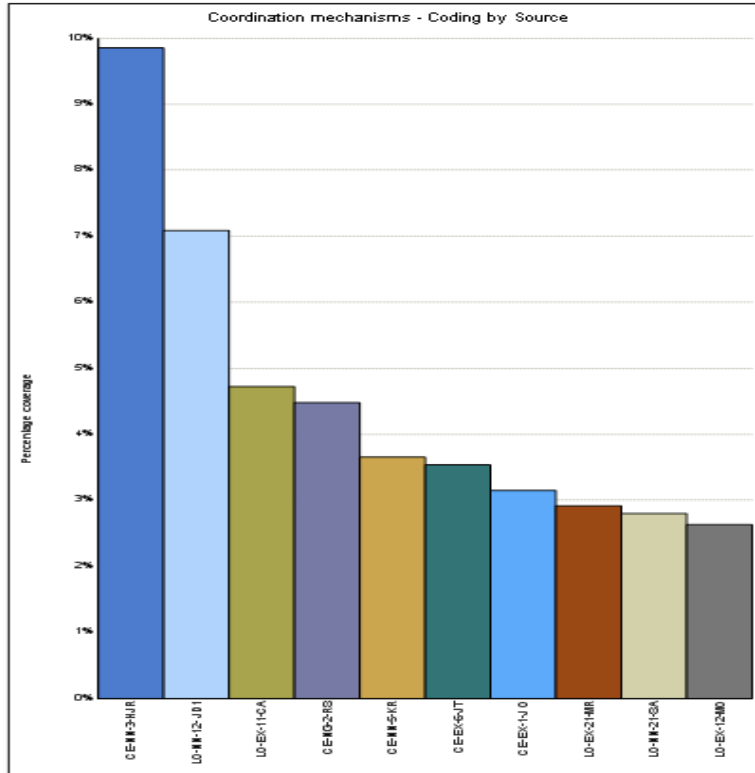
	Name	Nodes	References
	LO-CN-21-ES	18	39
	LO-CO-21-FE	5	10
	LO-CO-22-AOH	5	5
	LO-CO-23-Coop-S -Prod Sup	6	10
	LO-CO-EX-23-CS	10	16
	LO-EX-21-MR	16	42
	LO-EX-22-CAG	16	50
	LO-EX-24-CB	7	13
	LO-EX-25-DG	3	8
	LO-EX-26-Extension-Quality	3	5
	LO-EX-27-LM	15	30
	LO-FA-21-Prod Cauca	4	5
	LO-FA-22-Prod-Supia-1	7	12
	LO-NG-21- L B (2)	17	37
	LO-NN-21-SA	24	67

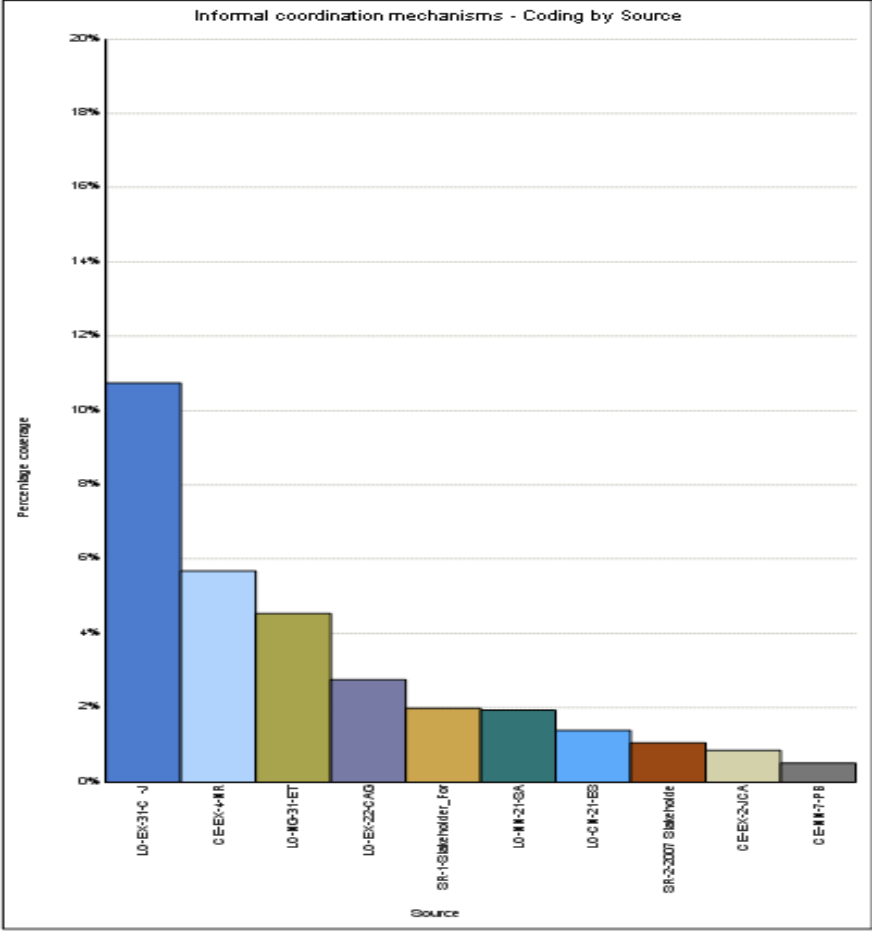
Brazil

	Name	Nodes	References
	LO-EX-31-C J	4	7
	LO-NG-31-ET	8	9

6.8.4 Appendix: Nodes by sources – Example

Governance mechanisms coding by source





6.8.5 Appendix: NVivo coded summary sheet in excel - Example

Governance Mechanisms

Variable / Year	State	Evidence	Reference
Coordination mechanisms	1. Disorganized communication	1a. "When I joined the program (2004-5?), I saw there were a lot of deficiencies in terms of clarity. There was nothing written, nothing was very organized and information was just passing from one person to another with vague indications of what really needed to be done."	1a.CE-EX-1
Coordination mechanisms	1b. Organized communication	1b. "My perception is that the communication and channel, and also contents, are already rather clear to those involved now on our side. And on the side of NN there is still some parallel communication on issues which have to be more streamlined... but this is not causing any problems, it's just that efficiency, I would say, can still be raised on this side as well as on NN side."	1b.CE-EX-6
Coordination mechanisms		1c. "The role of people like K and myself are very important as program coordinators at a global level. We are responsible to guarantee the communication flow is efficient but that the quality of communication is not lost or that it becomes overly technical. This has worked well so far and I think that if we maintain this principle it can continue working as the program grows."	1c.CE-EX-4
Coordination mechanisms		1d. "I think we found a good way of communicating. Of course we have the time difference with Switzerland, but, as I said, we work quite a lot as well with JD in Costa Rica. We are in the same time zone. But also with P in Switzerland we found a good way to communicate that whenever we need to talk we find a time to do so..."	1d.CE-NG-2
Coordination mechanisms		1e. "One thing that has changed lately is that now the communications are one-on-one. I talk with A, with S, with P, with K, but always one-on-one and not the whole group as it used to be. When a topic was discussed we could all chip in, while now you depend on them communicating among themselves. And people don't communicate the same way when you speak with them or when they are speaking to their boss..."	1e.CE-EX-2
Coordination mechanisms		1f. "If I'm talking to Ecom and if I want to do several projects with a company in 3,4,56 countries I can't do one one one conversation with each managing director... so we asked for some structure in place where we have someone overlooking the project from Ecom's perspective"	1f.CE-NN-5
Coordination mechanisms		1g. "The hiring of S as a member of the team was crucial. It helped solved a lot of bottlenecks and it gave an opportunity to our quality and technical people to talk directly with someone there, in their language, in their time-zone."	1g.CE-EX-4
Coordination mechanisms		1h. "Rainforest Alliances is a network of organizations... so they have local organizations... we convinced them that they should establish sort of key account managers, which is totally unique, they don't have that... so we now have a person, based in Guatemala, looking at all these different projects. So we brought her here for a week to explain, to show her everything. So we also moved RFA more into an understanding of how an enterprise works and how e could see a cooperation with this NGO. Very senior people at the NGO know this, but people that have been working on the field.. I think it was good to enhance a little more of understanding."	1h.CE-NN-5
Coordination mechanisms	2. Change buying processes	2. "The way of buying coffee has also changed. I sometimes think of Nespresso and mainstream coffee and if you think about it Nespresso is more like a Michelin star restaurant compared to a mainstream restaurant. The chef needs to go out and pick the best produce... It changes the way you buy"	2.CE-NN-3
Coordination mechanisms	3. People directly involved in the program	3a. "It is also very challenging in terms of the team working on our side for this project. At the beginning it was three of us, then four or five. Now, there are 25 people from our side working directly in the Nespresso AAA project from different organizations, and over 60 people involved at some level. It becomes quite difficult to be able to have an integrated vision of the program and to communicate a clear message to the farmer."	3a.CE-EX-1
Coordination mechanisms		3b. "I think that because in RFA we are different people in different places who work on this, and also from Nespresso there are different people, I think that it would be good to have once a year we try to come together and talk more in detail about where to take this program, let's say within two to three years, what are your goals, etc. Not just talking about numbers because Nespresso is very good in defining KPIs... so not just putting the numbers but looking a little bit closer, to get to these numbers what need to be done, by whom and when and which countries..."	3b.CE-NG-2
Coordination mechanisms	4. Commercial relationship	4. "I see contracts becoming less and less relevant in many ways. When we are working in clusters, we know that Nespresso is going to buy from us, whether we sign a paper doesn't really matter and.. They always pay a good price, so we are not concerned that we are missing a market here. The concern for the seller is that the buyer comes to the market and you don't get to sell... With this type of relationship, that concern goes away..."	4.CE-EX-7
Coordination mechanisms	5. Formalization and KPIs	5. "We start to claim things, and for that, you have to be able to measure and this is a totally new thing, we're moving from a kind of building phase into a phase where we have a certain scale, if you want to get even further that means measuring, that means key performance indicators... But when it becomes measurable there's obviously not this kind of openness because you start to defend that you haven't achieved the performance and so on..."	

Variable / Year	State	Evidence	Reference	-> 201
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Formal

Formal

Formal

Formal

Formal

Formal

Formal

Formal

Informal 1. TASQ balance, co-development 1.1 I think that TASQ today is very balanced in three aspects (quality, environment and socio-economic) because we had a chance to co-develop it, to discuss it, to adjust it and I think today it is a very balanced tool. 1. LO-EX-22

Informal 2. Report coordination 2. "In this there are about 4 or 5 different actors. So, instead of generating four or five reports we, Technoserve, collect all the data and process it. But for that you need all actors to be comfortable and willing to give us all the information, knowing what we will do with it. In the beginning that was quite difficult..." 2. LO-CN-21

Informal 3. Open communication 3a. "Nespresso addresses this program with an open attitude, following a strategy to really involve stakeholders and openly discuss concepts, progress and so on... this makes me think that a lot of the difficulties which might come up are addressed early..." 3a. CE-EX-6

Informal 3b. "Communication has always been very open and very direct. Communication is permanent and very fluid, there are no real restrictions, everything is very open to changes and innovation." 3b. LO-NG-21

Informal 4. Opportunities for informal contact 4. "The whole interaction process has been very good, including the workshops that were done here, those that were held in Switzerland and in other countries and to which our agronomists went. These events were fundamental in our relationship." 4. LO-CO-31, LO-NG-31, LO-EX-15

Informal 5. Informal 5. "Generally, when we have a meeting or ask for a document, we leave a formal trace of it, such 5. LO-CN-21

Variable / Year	2003			201
	State	Evidence	Reference	State
Formal	1. One pager RFA	1.General agreement to develop workplans for the pilot and reserach projects, including the building of a tool and recommendations on how to undertake farm assessment, verification and certification programs"	1. JA-3	1. Short supplier agreement
Formal	2. All major suppliers sign first letter of Intent	2a. All major suppliers signed a letter of Intent that was presented at the Sintercafé meeting in 2003 (even though only 2 were involved later in pilot projects)		2. General requireme /agreemer
Formal		2b. "Signing with all of our suppliers a letter of Intent was a good base to start saying "we are committed to doing this, we have already put a framework in place..."	2b.CE-CN-1	
Formal	3. FNC signs a first contract with NN	3. October 2003, FNC has a first contract, just for coffee	3.CE-EX-4	
Formal				
Formal				
Formal				
Formal				
Informal				
Informal				
Informal				
Informal				
Informal				

Governan

Variable / Year	2005			2008		
	Evidence	Reference	State	Evidence	Reference	State
Coordination mechanisms			1.Clarity of expectations -	1. "NN was very clear in communicating their expectations. The process starts with an AA coffee (just the quality part) and when that has been achieved, the rest of the program kicks-in.	1.CE-EX-4	
Coordination mechanisms						
Coordination mechanisms						
Coordination mechanisms						
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Coordination mechanisms						
Coordination mechanisms						
Coordination mechanisms						
Coordination mechanisms						
Coordination mechanisms						
Coordination mechanisms						
Coordination mechanisms						

Appendices

Variable / Year	2005			2006		
	Evidence	Reference	State	Evidence	Reference	State
Formal	1. 3 pgs - "The purpose of this partnership document is to set forth the understandings and intentions of the Parties with regard to shared goals in general terms. The Parties acknowledge that this AAA partnership is not a commercial engagement nor does constitute a legally binding commitment by any Party, but may lead to contracts of supply based on the fulfillment of the purpose of the agreement."	1. JA-1	1.RFA-NN Agreement	1.In September 2005,RFA and NN sign a document to guide activities between September 2005 and 2006 when a more formal contract would be agreed on."	1.JA-4	1. Emergence of Supplier Performance Review
Formal	2."Share intelligence on origins, organize a field pilot project, assist in bringin development capital in the project..."	2.JA-1				
Formal						
Formal						
Formal						
Formal						
Formal						
Formal						
Formal						
Informal						1. Visit to Colombia - CEO + Consultant
Informal						
Informal						
Informal						
Informal						
Informal						
Informal						
Conflict resolution						

Governan

Variable / Year	2007				
	Evidence	Reference	State	Evidence	Reference
Coordination mechanisms			1. NN-RFA reviews, communication	1. "...besides C. there is also our executive director TW, who's involved in Nespresso, of course, and from Nespresso there are different people like there's K and then there's D and there's P so maybe the recommendation would be that once a year we try to come together and talk more in detail about where to take this program, let's say within two to three years, what are your goals for within two to three years and not just talking about numbers because Nespresso is very good in defining KPIs ... so not just putting the numbers but looking a little bit closer, to get to these numbers what needs to be done, by whom and when, and which countries ...	1.CE-NG-2
Coordination mechanisms			2. Intra-organization coordination - NN	2."I think it would now be a good time to sit down, the whole team, for a few days and coordinate everything. It is quite difficult to manage all this by phone. K has some ideas, Alberto also needs to match his purchasing KPIs, A has the quality part, P-JD and myself are more aligned. But it would be good to first sit down ourselves and then also with Rainforest Alliance, the major partner in all of this."	2.LO-NN-21
Coordination mechanisms			3. Complexity	3."Coordination now is more difficult. Because there are more actors. There are also more interests and power relationships. An actor can now say "I get more PPP funding, listen to me"	3.CE-NN-1
Coordination mechanisms			4. Manual?	4."We still don't have an implementation manual for this thing. Ask Starbucks, they have one, everything is spelled out there. Even internal people sometimes complain they don't have a manual!"	
Coordination mechanisms				4b. Structure, process and cooperation rules, it is still not clear. There's been a lot of work on this, but it is still not clear."	4b.CE-NN-1
Coordination mechanisms			5. IT Systems	5a. "Everything is still handled in little word or excel spreadsheets, there is no SAP or anything like that yet!"	5a.CE-EX-2
Coordination mechanisms				5b."And you know what? Documents have to be really simple to work. Complicated documents are useless. If you see Nespresso documents they are all really simple, most of them in excel. Because every computer has excel. So the TASQ vforms and everything is in excel."	5b.LO-NN-12
Coordination mechanisms			6. Local structure	6."I think the arrival of the local manager in Colombia helped a lot in structuring at the local level. A lot of the topics that had not been dealt with were handled and resolved"	6. CE-EX-2
Coordination mechanisms			7. Intra-organization coordination - NN	7."The major challenge we have is how to organize internally to allow for the projected growth. Both in the countries where we are today and where we are planning to expand to."	7.LO-NN-21
Coordination mechanisms					
Coordination mechanisms					
Coordination mechanisms					
Coordination mechanisms					

Variable / Year			2007		
	Evidence	Reference	State	Evidence	Reference
Formal	1. From 1 to 5 points: Ensure continue supply based on long term cooperation, Provide transparency, Focused Investments, develop efficient supply chain and organization, support continuous improvement, long term view, abassador in coffee region, predictable partner allows long term view, added value through differentiation and innovation Qualitative Assessment: On time deliveries (%), approvals of pre-shipment samples, approvals of arrivals samples	1. JA-2	1. Yearly joint assessment meetings	1. "We changed things, we are also trying to have the continuous improvements inside the program, so we get better, we get more efficient, more clarity, and everything. What we normally do, we invite the first contact in Europe here, and sometimes they bring someone, someone from the origin country, and we do a yearly meeting where we are going to present what... what is... what has been the results and what are the focus for next year, what is the changes, and these kind of things..."	1.CE-NN-7
Formal			2. AAA Commitment document with suppliers	2. "An operating agreement for the joint commitment to sourcing AAA Sustainable Quality Coffee." - 60 pg document	2.JA-2
Formal				2b. Includes quality requirements, farm and cluster level criteria for quality and sustainability, traceability (economic and physical)	
Formal				2c. "There was not a lot of consultation before this document came out, not a lot of time to make any changes..."	2c.CE-EX-2
Formal			3. RFA-NN	3. Five year statement of commitment with RFA. "This statement requires a corresponding commitment by each of the suppliers towards the achievements of KPIs in each of the clusters, leading to a "Shared Commitment" document to be mutually adopted by NN and each supplier"	3.JA-2
Formal			4. Supplier and supplier bosses - Clarity	4. "Especially the bosses, and then when I came back, I discuss with D and K saying we need something clear, a sign that it's not all what we want, because they are not supporting the people in the field, because they don't know what we want. And then they did this document..."	4.CE-NN-7
Formal			5. Evaluation, formal mechanisms	5. "Everything is very clear. We have an annual review, it's very formal, very structured and we know the targets for the year..."	5.CE-EX-7
Formal			6. Over KPIed?	6. "I think we might have gone too far with these KPIs. We are measuring inputs and not outputs. If I'm measured on how many producers come to each conference, and my target is 200 and I only have 150 so far, I may raffle a TV among the attendants, so I can count more people in the session... There needs to be a balance, not keeping track of each activity and input..." What I need to measure is the level of commitment of this supplier, that's the important thing..."	6.LO-EX-11
Informal	1. "A very important event was when K and D visited the coffee conference, attended by many producers. They explained the program, they organized a tasting of the product and the producers actually met them, that was really important."	1.LO-EX-22	1. Second stakeholder forum	1a. Second stakeholder forum held in Costa Rica in October 2007 to "honour a commitment made at the first Forum to reconvene after two years and to ensure there would be an opportunity to share experiences and best practices across the wider network of stakeholders." The process of stakeholder engagement is ongoing. The Forum itself is not the process, but an additional tool to accelerate a process that continues before and after."	1a.SR-2
Informal				1b. "On the second day of the Forum leaders from Nespresso and Nestlé shared their perspectives on the nature of the challenge, their efforts to date and their future vision for AAA. Then, they listened to a spectrum of view points given by or on behalf of farmers, suppliers, consumers and NGOs	1b.SR-2
Informal			2. Meetings	2. "Well, the issue with these "macro" meetings is that the probability of touching on sensitive subjects or topics that require a high level of trust... It doesn't happen. I think they are good for giving a general sense of direction but I don't think any supplier really dears to touch on sensitive topics as the ones we discussed about the concessions that Nespresso maybe forced to make in the future"	2.CE-EX-4
Informal			3. Speed of decision making	3. "We just figured out a way to implement one part of the program and asked them about it... they never answered so we told them we were going to go ahead, but then the conversations started, things before were decided and executed much faster, now there's more bureaucracy for everything..."	3.CE-EX-2
Informal					

6.9 Appendix: Project 3 - Additional data sources

Referred to in Section 4.4.3

6.9.1 Project 3: Industry websites accessed

Organization	Web presence	Website information on sustainability partnerships	Other sources	Access date
Organizations				
Cafexport	No	Not available	Project interviews, initiatives websites	
Cooxupe Cerrado	www.cooxupe.com.br	Not available	Project interviews, initiatives websites	15/04/09
Efico	www.efico.com	Not available	Project interviews, initiatives websites	15/04/09
Expocafe	Site in construction	Not available	Project interviews, initiatives websites	
Federación Nacional de Cafeteros	www.cafedecolombia.com	Not available	Project interviews, initiatives websites, news search	15/04/09
Nestlé	www.nestle.com	www.nestle.com/CSV/Reports/Reports.htm	Project interviews, initiatives websites	10/04/09
Neumann Kaffee Gruppe	www.nkg.net	www.coffee-partners.org/	Project interviews, initiatives websites	15/04/09
Technoserve	www.technoserve.org	www.technoserve.org/take_action/partnerwithus.aspx	Project interviews, initiatives websites	15/04/09
Volcafe	www.volcafe.com	www.volcafe.com/main.htm		15/04/09
Sustainability Initiatives / Certification Programs				
Common Code Coffee Community	www.4c-coffeeassociation.org	www.4c-coffeeassociation.org/download/2009/4C_Members_List_Mar27_en.pdf		10/04/09
Rainforest Alliance	www.rainforest-alliance.org	www.rainforest-alliance.org/agriculture.cfm?id=coffee	Project interviews, Organization websites	10/04/09
Utz Certified	www.utzcertified.org	www.utzcertified.org/index.php?pageID=154	Project interviews, Organization websites	15/04/09
Starbucks CAFÉ Practices	www.starbucks.com	www.starbucks.com/aboutus/csr.asp	Project interviews	10/04/09
Fairtrade	www.fairtrade.net	Not available	Project interviews, Organization websites	15/04/09
Organic	www.ifoam.org	Not available	Project interviews, Organization websites	10/04/09

6.10 Project 3 - Network matrices

Referred to in Section 1.6.5, Section 1.8.3, Section 4.4.6, Section 4.6.1, Section 4.6.4, Section 4.7

6.10.1 Sustainability, Commercial and Personal Networks

Figure 6-2: AAA Sustainability Network (R)

R2003

		1	2	3	4	5	6	7	8	9	0	1
		G	F	R	R	N	N	E	E	E	E	E
1	Goodbrand	0	0	0	1	1	0	1	1	0	0	1
2	FundaNatura COLB	0	0	1	1	1	0	0	0	0	1	0
3	Rainforest Alliance CTCA	0	1	0	1	1	0	1	0	1	0	0
4	Rainforest Alliance HQ	1	1	1	0	1	0	1	1	0	0	1
5	Nespresso HQ	1	1	1	1	0	1	1	1	0	1	1
6	Nestle HQ	0	0	0	0	1	0	0	0	0	0	0
7	Ecom CTCA	1	0	1	1	1	0	0	1	1	0	0
8	Ecom HQ	1	0	0	1	1	0	1	0	0	0	0
9	Ecom CTCA Lgi	0	0	1	0	0	0	1	0	0	0	0
10	Expocafé COLB	0	1	0	0	1	0	0	0	0	0	1
11	Expocafé-Cafexport	1	0	0	1	1	0	0	0	0	1	0

Matrix has 11 rows, 11 columns, and 1 levels.

R2004

		1	2	3	4	5	6	7	8	9	0	1	1	1	1	1	1	1	1	2	2
		G	F	F	I	P	R	R	N	N	C	E	E	E	E	E	E	E	E	E	E
1	Goodbrand	0	0	0	0	0	1	1	0	1	1	0	1	0	0	0	0	1	0	0	1
2	FIIT GALA	0	0	1	1	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0
3	FundaNatura COLB	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1
4	Imaflora BRA	0	1	1	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0
5	Pro Natura Sud MEXI	0	1	1	0	1	1	1	0	0	0	0	0	0	1	0	1	0	0	0	0
6	Rainforest Alliance CTCA	0	1	1	1	1	0	1	1	0	0	1	0	0	0	0	1	0	0	0	0
7	Rainforest Alliance HQ	1	1	1	1	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0
8	Nespresso HQ	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	0	1	0	1	1
9	Nestle HQ	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Cooxupe Cerrado BRA	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
11	Ecom CTCA	1	0	0	0	0	1	1	1	0	0	1	1	0	0	1	1	0	0	0	0
12	Ecom GALA	0	1	0	0	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0
13	Ecom HQ	1	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	1	0	0	0
14	Ecom GALA Hue	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
15	Ecom MEXI Ixh	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
16	Ecom CTCA Lgi	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17	Ecom MEXI	0	0	0	0	1	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0
18	Efico	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
19	Expocafé COLB Cal	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
20	Expocafé COLB	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
21	Expocafé-Cafexport	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1

Matrix has 21 rows, 21 columns, and 1 levels.

R2005

		1	2	3	4	5	6	7	8	9	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2
		G	F	F	I	P	R	R	N	N	N	C	E	E	E	E	E	E	E	E	E	E	F	F	F
1		Goodbrand	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2		FIIT GALA	0	0	1	1	1	1	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0
3		FundaNatura COLB	0	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0
4		Imaflora BRA	0	1	1	0	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5		Pro Natura Sud MEXI	0	1	1	1	0	1	1	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0
6		Rainforest Alliance CTCA	0	1	1	1	1	0	1	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0
7		Rainforest Alliance HQ	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8		Nespresso HQ	1	0	1	1	0	0	1	0	1	1	1	0	0	1	0	0	0	0	1	0	1	0	1
9		Nestle HQ	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10		Nespresso CTCA	0	1	0	0	1	1	0	0	0	1	1	0	1	1	1	1	1	0	0	0	0	0	0
11		Cooxupe Cerrado BRA	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
12		Ecom CTCA	0	0	0	0	0	1	0	0	1	0	0	1	1	0	0	1	1	0	0	0	0	0	0
13		Ecom GALA	0	1	0	0	0	0	0	0	1	0	1	0	1	1	0	0	1	0	0	0	0	0	0
14		Ecom HQ	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0
15		Ecom GALA Hue	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
16		Ecom MEXI Ixh	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
17		Ecom CTCA Lgi	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
18		Ecom MEXI	0	0	0	0	1	0	0	0	1	0	1	1	1	0	1	0	0	0	0	0	0	0	0
19		Efico	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
20		Expocafé COLB Cal	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
21		Expocafé COLB	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
22		Expocafé-Cafexport	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
23		FNC COLB Cau	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
24		FNC COLB	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
25		FNC EUR	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
26		FNC COLB Nar	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

Matrix has 26 rows, 26 columns, and 1 levels.

R2006

		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	
		G	T	T	F	F	I	P	R	R	N	N	N	C	E	E	E	E	E	E	E	E	E	E	E	F	F	F	V	V
1		Goodbrand	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2		Technoserve COLB	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
3		Technoserve HQ	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4		FIIT GALA	0	0	0	0	1	1	1	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5		FundaNatura COLB	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0
6		Imaflora BRA	0	0	0	1	1	0	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7		Pro Natura Sud MEXI	0	0	0	1	1	1	0	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8		Rainforest Alliance CTCA	0	0	0	1	1	1	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0
9		Rainforest Alliance HQ	1	0	0	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10		Nespresso HQ	1	0	1	0	1	1	0	0	1	1	0	0	1	0	0	0	0	0	1	0	1	0	1	0	1	0	1	0
11		Nestle HQ	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12		Nespresso CTCA	0	0	0	1	0	1	1	0	1	0	0	1	1	0	1	1	1	1	0	0	0	0	0	0	1	0	1	0
13		Cooxupe Cerrado BRA	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
14		Ecom CTCA	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
15		Ecom GALA	0	0	0	1	0	0	0	0	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
16		Ecom HQ	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
17		Ecom GALA Hue	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18		Ecom MEXI Ixh	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
19		Ecom CTCA Lgi	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20		Ecom MEXI	0	0	0	0	0	1	0	0	0	0	1	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0
21		Ecom CTCA Oro	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22		Efico	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23		Expocafé COLB Cal	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
24		Expocafé COLB	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
25		Expocafé-Cafexport	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
26		FNC COLB Cau	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
27		FNC COLB	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
28		FNC EUR	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
29		FNC COLB Nar	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
30		Volcafé CTCA	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
31		Volcafé HQ	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
32		Volcafé CTCA Sdo	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

Matrix has 32 rows, 32 columns, and 1 levels.

C2003

		1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2			
		G	N	N	C	E	E	E	E	E	E	E	E	E	E	E	E	F	F	F	F	N	N	N	V	V		
1	Goodbrand	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2	Nespresso HQ	1	0	1	1	1	1	1	0	0	0	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1	0	
3	Nestle HQ	0	1	0	1	1	1	1	0	0	0	1	0	1	0	0	0	0	1	1	0	1	1	0	1	1	0	
4	Cooxupe Cerrado BRA	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Ecom CTCA	0	1	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	Ecom GALA	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	Ecom HQ	0	1	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	Ecom GALA Hue	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	Ecom MEXI Ixh	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	Ecom CTCA Lgi	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	Ecom MEXI	0	1	1	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	Ecom CTCA oro	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	Efico	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	Expocafé COLB Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
15	Expocafé COLB	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	
16	Expocafé-Cafexport	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
17	FNC COLB Cau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
18	FNC COLB	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	
19	FNC EUR	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
20	FNC COLB Nar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
21	Neumann KG COLB	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	
22	Neumann KG HQ	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
23	Neumann KG COLB Hui	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
24	Volcafé CTCA	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
25	Volcafé HQ	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
26	Volcafé CTCA sdo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	

Matrix has 26 rows, 26 columns, and 1 levels.

C2004-07

		1	2	3	4	5	6	7	8	9	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2			
		N	N	C	E	E	E	E	E	E	E	E	E	E	E	E	F	F	F	F	N	N	N	V	V	V		
1	Nespresso HQ	0	1	1	1	1	1	0	0	0	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1	0		
2	Nestle HQ	1	0	1	1	1	1	0	0	0	1	0	1	0	0	0	0	1	1	0	1	1	0	1	1	0		
3	Cooxupe Cerrado BRA	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
4	Ecom CTCA	1	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
5	Ecom GALA	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6	Ecom HQ	1	1	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	Ecom GALA Hue	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8	Ecom MEXI Ixh	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	Ecom CTCA Lgi	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	Ecom MEXI	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	Ecom CTCA Oro	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	Efico	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	Expocafé COLB Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
14	Expocafé COLB	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	
15	Expocafé-Cafexport	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
16	FNC COLB Cau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
17	FNC COLB	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	
18	FNC EUR	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
19	FNC COLB Nar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
20	Neumann KG COLB	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0		
21	Neumann KG HQ	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0		
22	Neumann KG COLB Hui	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
23	Volcafé CTCA	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
24	Volcafé HQ	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
25	Volcafé CTCA sdo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	

Matrix has 25 rows, 25 columns, and 1 levels.

Figure 6-4: Personal Network (P)
P2002-03

		1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	2	2	2	2	2	2	2	3	
		G	F	F	I	P	R	R	N	C	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F	F	F	N	N	N	V	V
1	Goodbrand	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	FIIT GALA	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	FundaNatura COLB	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	Imaflora BRA	0	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Pro Natura Sud MEXI	0	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	Rainforest Alliance CTCA	0	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	Rainforest Alliance HQ	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	Nespresso HQ	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	
9	Cooxupe Cerrado BRA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
10	Ecom CTCA	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	Ecom GALA	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	Ecom HQ	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	Ecom GALA Hue	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	Ecom MEXI Ixh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	Ecom CTCA Lgi	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	Ecom MEXI	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	Ecom CTCA Oro	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	Efico	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
19	Expocafé COLB Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	
20	Expocafé COLB	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	
21	Expocafé-Cafexport	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	
22	FNC COLB Cau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	
23	FNC COLB	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	0	0	0	
24	FNC EUR	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	
25	FNC COLB Nar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	
26	Neumann KG COLB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	
27	Neumann KG HQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
28	Neumann KG COLB Hui	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
29	Volcafé CTCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
30	Volcafé CTCA Sdo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

Matrix has 30 rows, 30 columns, and 1 levels.

P2004

		1	2	3	4	5	6	7	8	9	0	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3		
		G	F	F	I	P	R	R	N	C	E	E	E	E	E	E	E	E	E	E	E	E	F	F	F	F	N	N	N	V	V
1	Goodbrand	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	FIIT GALA	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	FundaNatura COLB	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	Imaflora BRA	0	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Pro Natura Sud MEXI	0	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	Rainforest Alliance CTCA	0	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	Rainforest Alliance HQ	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	Nespresso HQ	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	
9	Cooxupe Cerrado BRA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
10	Ecom CTCA	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
11	Ecom GALA	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	Ecom HQ	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	Ecom GALA Hue	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	Ecom MEXI Ixh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	Ecom CTCA Lgi	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	Ecom MEXI	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	Ecom CTCA Oro	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	Efico	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
19	Expocafé COLB Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	
20	Expocafé COLB	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	
21	Expocafé-Cafexport	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	
22	FNC COLB Cau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	
23	FNC COLB	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	0	0	
24	FNC EUR	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	
25	FNC COLB Nar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	
26	Neumann KG COLB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
27	Neumann KG HQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
28	Neumann KG COLB Hui	0	0																												

P2005

		1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3				
		G	F	F	I	P	R	R	N	C	E	E	E	E	E	E	E	E	E	F	F	F	F	N	N	N	V	V				
1	Goodbrand	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2	FIIT GALA	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
3	FundaNatura COLB	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
4	Imaflora BRA	0	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
5	Pro Natura Sud MEXI	0	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
6	Rainforest Alliance CTCA	0	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7	Rainforest Alliance HQ	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8	Nespresso HQ	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0			
9	Cooxupe Cerrado BRA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0			
10	Ecom CTCA	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0			
11	Ecom GALA	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0			
12	Ecom HQ	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0			
13	Ecom GALA Hue	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
14	Ecom MEXI Ixh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0			
15	Ecom CTCA Lgí	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0			
16	Ecom MEXI	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
17	Ecom CTCA Oro	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0			
18	Efíco	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
19	Expocafé COLB Ca1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0			
20	Expocafé COLB	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0			
21	Expocafé-Cafexport	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0		
22	FNC COLB Cau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0			
23	FNC COLB	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0			
24	FNC EUR	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0			
25	FNC COLB Nar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0			
26	Neumann KG COLB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	
27	Neumann KG HQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
28	Neumann KG COLB Huí	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
29	Volcafé CTCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
30	Volcafé CTCA Sdo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

Matrix has 30 rows, 30 columns, and 1 levels.

P2006

		1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3			
		G	F	F	I	P	R	R	N	N	C	E	E	E	E	E	E	E	E	E	F	F	F	F	N	N	N	V	V			
1	Goodbrand	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2	FIIT GALA	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
3	FundaNatura COLB	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
4	Imaflora BRA	0	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
5	Pro Natura Sud MEXI	0	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6	Rainforest Alliance CTCA	0	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7	Rainforest Alliance HQ	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8	Nespresso HQ	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0		
9	Nespresso CTCA	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
10	Cooxupe Cerrado BRA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0		
11	Ecom CTCA	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0		
12	Ecom GALA	0	0	0	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
13	Ecom HQ	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
14	Ecom GALA Hue	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
15	Ecom MEXI Ixh	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
16	Ecom CTCA Lgí	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0		
17	Ecom MEXI	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
18	Ecom CTCA Oro	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
19	Efíco	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
20	Expocafé COLB Ca1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0		
21	Expocafé COLB	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0		
22	Expocafé-Cafexport	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0		
23	FNC COLB Cau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0		
24	FNC COLB	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0		
25	FNC EUR	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0		
26	FNC COLB Nar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0		
27	Neumann KG COLB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	
28	Neumann KG HQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
29	Neumann KG COLB Huí	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
30	Volcafé CTCA																															

P2007

		1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3	3	
		G	F	F	I	P	R	R	N	N	N	C	E	E	E	E	E	E	E	E	E	F	F	F	F	N	N	N	V	V
1	Goodbrand	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	FIIT GALA	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	FundaNatura COLB	0	1	0	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
4	Imaflora BRA	0	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Pro Natura Sud MEXI	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	Rainforest Alliance CTCA	0	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	Rainforest Alliance HQ	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	Nespresso HQ	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	
9	Nespresso CTCA	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	
10	Nespresso COLB	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	Cooxupe Cerrado BRA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
12	Ecom CTCA	0	0	0	0	0	0	1	1	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
13	Ecom GALA	0	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
14	Ecom HQ	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
15	Ecom GALA Hue	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	Ecom MEXI Ixh	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
17	Ecom CTCA Lgi	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
18	Ecom MEXI	0	0	0	0	0	0	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
19	Ecom CTCA Oro	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
20	Efico	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21	Expocafé COLB Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	
22	Expocafé COLB	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	
23	Expocafé-Cafexport	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	
24	FNC COLB Cau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
25	FNC COLB	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	0	0	
26	FNC EUR	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	
27	FNC COLB Nar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	
28	Neumann KG COLB	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
29	Neumann KG HQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
30	Neumann KG COLB Hui	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
31	Volcafé CTCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
32	Volcafé CTCA Sdo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	

Matrix has 32 rows, 32 columns, and 1 levels.

6.10.2 Actor attributes and affiliation matrices:

Actor attribute

Column partition:
Input dataset: Player type-2 (C:\docum

		1	2	3
		Ca	Ge	Co
1	Goodbrand	4	1	9
2	Technoserve COLB	4	2	5
3	Technoserve HQ	4	1	10
4	IFC	5	1	7
5	FIIT GALA	3	2	7
6	FundaNatura COLB	3	2	5
7	Imaflora BRA	3	2	8
8	Pro Natura Sud MEXI	3	2	6
9	Rainforest Alliance CTCA	3	2	4
10	Rainforest Alliance HQ	3	1	10
11	Nespresso HQ	1	1	1
12	Nestle HQ	1	1	1
13	Nespresso CTCA	1	2	4
14	Nespresso COLB	1	2	5
15	Cooxupe Cerrado BRA	2	2	8
16	Ecom CTCA	2	2	4
17	Ecom GALA	2	2	6
18	Ecom HQ	2	1	1
19	Ecom GALA Hue	2	3	7
20	Ecom MEXI Ixh	2	3	6
21	Ecom CTCA Lgi	2	3	4
22	Ecom MEXI	2	2	6
23	Ecom CTCA Oro	2	3	4
24	Efico	2	1	3
25	Expocafé COLB Cal	2	3	5
26	Expocafé COLB	2	1	5
27	Expocafé-Cafexport	2	4	1
28	FNC COLB Cau	2	3	5
29	FNC COLB	2	1	5
30	FNC EUR	2	4	3
31	FNC COLB Nar	2	3	5
32	Neumann KG COLB	2	2	5
33	Neumann KG HQ	2	1	2
34	Neumann KG COLB Hui	2	3	5
35	Volcafé CTCA	2	2	4
36	Volcafé HQ	2	1	1
37	Volcafé CTCA Sdo	2	3	4

Matrix has 37 rows, 3 columns, and 1 levels.

Affiliation matrix

Input dataset: Sustainability (C:\Documents

		1	2	3	4	5	6	7
		S	R	F	O	U	N	
1		-	-	-	-	-	-	-
2	Goodbrand	0	0	1	0	0	0	1
3	Technoserve COLB	0	0	0	0	1	1	1
4	Technoserve HQ	0	0	0	1	1	0	1
5	IFC	1	0	1	1	0	0	1
6	FIIT GALA	1	0	1	0	0	0	1
7	FundaNatura COLB	1	0	1	0	0	0	1
8	Imaflora BRA	1	0	1	0	0	0	1
9	Pro Natura Sud MEXI	1	0	1	0	0	0	1
10	Rainforest Alliance CTCA	1	0	1	0	0	0	1
11	Rainforest Alliance HQ	1	1	1	0	0	0	1
12	Nespresso HQ	0	1	1	0	0	0	1
13	Nestle HQ	0	1	0	1	0	0	1
14	Nespresso CTCA	0	0	1	0	0	0	1
15	Nespresso COLB	0	0	1	0	0	0	1
16	Cooxupe Cerrado BRA	1	1	1	1	1	1	1
17	Ecom CTCA	1	1	1	1	1	1	1
18	Ecom GALA	1	1	1	1	1	1	1
19	Ecom HQ	1	1	1	1	1	1	1
20	Ecom GALA Hue	1	1	1	1	1	1	1
21	Ecom MEXI Ixh	1	1	1	1	1	1	1
22	Ecom CTCA Lgi	1	1	1	1	1	1	1
23	Ecom MEXI	1	1	1	1	1	1	1
24	Ecom CTCA Oro	1	1	1	1	1	1	1
25	Efico	1	1	1	1	1	1	1
26	Expocafé COLB Cal	1	1	1	1	1	1	1
27	Expocafé COLB	1	1	1	1	1	1	1
28	Expocafé-Cafexport	1	1	1	1	1	1	1
29	FNC COLB Cau	0	1	1	1	1	1	1
30	FNC COLB	0	1	1	1	1	1	1
31	FNC EUR	0	1	1	1	1	1	1
32	FNC COLB Nar	0	1	1	1	1	1	1
33	Neumann KG COLB	1	1	1	1	1	1	1
34	Neumann KG HQ	1	1	1	1	1	1	1
35	Neumann KG COLB Hui	1	1	1	1	1	1	1
36	Volcafé CTCA	1	1	1	1	1	1	1
37	Volcafé HQ	1	1	1	1	1	1	1
	Volcafé CTCA Sdo	1	1	1	1	1	1	1

Matrix has 37 rows, 7 columns, and 1 levels.

6.10.3 Sustainability Network Centralization measures

AAA Programme Relationship Network (R) - Centralization measures

Freeman's Degree Centrality Measures

2003			2005			2006			2007		
Nm	Degree	Share	Nm	Degree	Share	Nm	Degree	Share	Nm	Degree	Share
Nespresso HQ	90.0	0.180	Nespresso HQ	75.0	0.123	Nespresso HQ	52.0	0.098	Nespresso HQ	51.6	0.096
Rainforest Alliance HQ	70.0	0.140	Rainforest Alliance HQ	50.0	0.082	FundaNatura COLB	44.0	0.083	Nespresso CTCA	41.9	0.078
Ecom CTCA	60.0	0.120	FIIT GALA	40.0	0.066	Nespresso CTCA	40.0	0.076	FundaNatura COLB	35.5	0.066
Goodbrand	50.0	0.100	FundaNatura COLB	40.0	0.066	FIIT GALA	32.0	0.061	Rainforest Alliance CTCA	35.5	0.066
Rainforest Alliance CTCA	50.0	0.100	Pro Natura Sud MEXI	40.0	0.066	Pro Natura Sud MEXI	32.0	0.061	FIIT GALA	25.8	0.048
FundaNatura COLB	40.0	0.080	Rainforest Alliance CTCA	40.0	0.066	Rainforest Alliance CTCA	32.0	0.061	Pro Natura Sud MEXI	25.8	0.048
Ecom HQ	40.0	0.080	Ecom CTCA	40.0	0.066	Imaflora BRA	28.0	0.053	Imaflora BRA	22.6	0.042
Expocafé-Cafexport	40.0	0.080	Goodbrand	35.0	0.057	Rainforest Alliance HQ	28.0	0.053	Rainforest Alliance HQ	22.6	0.042
Expocafé COLB	30.0	0.060	Imaflora BRA	35.0	0.057	Ecom CTCA	24.0	0.045	Ecom CTCA	22.6	0.042
Ecom CTCA Lgi	20.0	0.040	Ecom GALA	30.0	0.049	Ecom GALA	24.0	0.045	Ecom GALA	19.4	0.036
Nestle HQ	10.0	0.020	Ecom HQ	30.0	0.049	Ecom MEXI	24.0	0.045	Ecom MEXI	19.4	0.036
			Expocafé-Cafexport	25.0	0.044	FNC COLB	20.0	0.038	Expocafé COLB	16.1	0.030
			Ecom MEXI	25.0	0.041	Ecom HQ	16.0	0.030	FNC COLB	16.1	0.030
			Expocafé-Cafexport	25.0	0.041	Expocafé COLB	16.0	0.030	Volcafé CTCA	16.1	0.030
			Cooxupe Cerrado BRA	20.0	0.033	Cooxupe Cerrado BRA	12.0	0.023	Technoserve COLB	12.9	0.024
			Expocafé COLB	20.0	0.033	Ecom GALA Hue	12.0	0.023	Ecom HQ	12.9	0.024
			Efico	15.0	0.025	Ecom MEXI Ixh	12.0	0.023	Expocafé COLB Cal	12.9	0.024
			Expocafé COLB Cal	15.0	0.025	Ecom CTCA Lgi	12.0	0.023	Expocafé-Cafexport	12.9	0.024
			Ecom GALA Hue	10.0	0.016	Expocafé COLB Cal	12.0	0.023	Goodbrand	9.7	0.018
			Ecom MEXI Ixh	10.0	0.016	Expocafé-Cafexport	12.0	0.023	Technoserve HQ	9.7	0.018
			Ecom CTCA Lgi	10.0	0.016	Goodbrand	8.0	0.015	Cooxupe Cerrado BRA	9.7	0.018
			Nestle HQ	5.0	0.008	Efico	8.0	0.015	Ecom GALA Hue	9.7	0.018
						FNC COLB Cau	8.0	0.015	Ecom MEXI Ixh	9.7	0.018
						FNC EUR	8.0	0.015	Ecom CTCA Lgi	9.7	0.018
						FNC COLB Nar	8.0	0.015	Ecom CTCA Oro	9.7	0.018
						Nestle HQ	4.0	0.008	Volcafé CTCA Sdo	9.7	0.018
									Efico	6.5	0.012
									FNC COLB Cau	6.5	0.012
									Ecom CTCA Oro	6.5	0.012
									FNC COLB Cau	6.5	0.012
									FNC EUR	6.5	0.012
									FNC COLB Nar	6.5	0.012
									Volcafé HQ	6.5	0.012
									Nestle HQ	3.2	0.006
									Nespresso COLB	41.7	0.073
									Nespresso CTCA	38.9	0.068
									FundaNatura COLB	36.1	0.063
									Nespresso HQ	36.1	0.063
									Rainforest Alliance CTCA	30.6	0.053
									FIIT GALA	22.2	0.039
									Pro Natura Sud MEXI	22.2	0.039
									Ecom CTCA	22.2	0.039
									Imaflora BRA	19.4	0.034
									Rainforest Alliance HQ	19.4	0.034
									FNC COLB	19.4	0.034
									Technoserve COLB	16.7	0.029
									Ecom GALA	16.7	0.029
									Ecom MEXI	16.7	0.029
									Expocafé COLB Cal	16.7	0.029
									Ecom HQ	13.9	0.024
									Expocafé COLB	13.9	0.024
									Expocafé-Cafexport	13.9	0.024
									Goodbrand	11.1	0.019
									IFC	11.1	0.019
									Neumann KG COLB	11.1	0.019
									Volcafé CTCA	11.1	0.019
									Technoserve HQ	8.3	0.015
									Cooxupe Cerrado BRA	8.3	0.015
									Ecom GALA Hue	8.3	0.015
									Ecom MEXI Ixh	8.3	0.015
									Ecom CTCA Lgi	8.3	0.015
									Ecom CTCA Oro	8.3	0.015
									FNC COLB Cau	8.3	0.015
									FNC EUR	8.3	0.015
									FNC COLB Nar	8.3	0.015
									Volcafé CTCA Sdo	8.3	0.015
									Efico	5.6	0.010
									Neumann KG HQ	5.6	0.010
									Volcafé HQ	5.6	0.010
									Nestle HQ	2.8	0.005

Closeness Centrality Measures

2003		2004		2005		2006		2007	
	nCloseness		nCloseness		nCloseness		nCloseness		nCloseness
Nespresso HQ	90.91	Nespresso HQ	80.00	Nespresso HQ	87.57	Nespresso HQ	87.39	Nespresso COLB	63.16
Rainforest Alliance HQ	76.92	Rainforest Alliance HQ	86.67	FundaNatura COLB	84.10	FundaNatura COLB	80.78	Nespresso CTCA	62.07
Ecom CTCA	71.43	FIIT GALA	62.50	Imaflora BRA	58.14	Nespresso CTCA	58.49	Nespresso HQ	61.02
Goodbrand	66.87	FundaNatura COLB	62.50	Rainforest Alliance HQ	58.14	Imaflora BRA	55.36	FundaNatura COLB	55.38
Rainforest Alliance CTC/	66.87	Pro Natura Sud MEXI	62.50	Nespresso CTCA	58.14	Rainforest Alliance HQ	55.36	Rainforest Alliance HQ	54.55
FundaNatura COLB	62.50	Rainforest Alliance CTC/	62.50	FIIT GALA	54.35	Rainforest Alliance CTC/	54.36	Rainforest Alliance CTC/	52.94
Ecom HQ	62.50	Imaflora BRA	60.61	Pro Natura Sud MEXI	54.35	FIIT GALA	50.82	Imaflora BRA	50.70
Expocafé-Cafexport	58.82	Ecom CTCA	60.61	Rainforest Alliance CTC/	54.35	Pro Natura Sud MEXI	50.82	FIIT GALA	49.32
Expocafé COLB	55.56	Goodbrand	57.14	Ecom HQ	51.02	Volcafé CTCA	50.82	Pro Natura Sud MEXI	49.32
Nestle HQ	50.00	Ecom GALA	57.14	FNC COLB	49.02	Ecom HQ	49.21	Expocafé-Cafexport	45.57
Ecom CTCA Lgi	47.82	Ecom HQ	57.14	Expocafé COLB	48.08	Expocafé COLB	47.89	Ecom CTCA	45.00
		Expocafé-Cafexport	51.28	Ecom CTCA	45.45	FNC COLB	46.97	Ecom HQ	45.00
		Expocafé COLB	50.00	Ecom GALA	45.45	Goodbrand	44.26	FNC COLB	44.44
		Cooxupe Cerrado BRA	48.78	Ecom MEXI	45.45	Ecom CTCA	44.26	FNC EUR	44.44
		Ecom MEXI	48.78	Cooxupe Cerrado BRA	44.64	Cooxupe Cerrado BRA	43.86	Expocafé COLB Cal	43.90
		Efico	47.82	Goodbrand	43.86	Ecom GALA	43.86	Ecom GALA	43.37
		Nestle HQ	45.45	Ecom GALA Hue	43.10	Ecom MEXI	43.86	Ecom MEXI	43.37
		Ecom CTCA Lgi	43.48	Ecom MEXI Ixh	43.10	Expocafé-Cafexport	43.86	Expocafé COLB	43.37
		Ecom GALA Hue	42.55	Ecom CTCA Lgi	43.10	Technoserve HQ	43.06	Goodbrand	42.86
		Ecom MEXI Ixh	42.55	Expocafé-Cafexport	43.10	FNC EUR	42.47	Neumann KG COLB	42.86
		Expocafé COLB Cal	42.55	FNC EUR	43.10	Volcafé HQ	42.47	Technoserve COLB	42.35
				Efico	41.87	Ecom GALA Hue	41.89	IFC	42.35
				Expocafé COLB Cal	41.87	Ecom MEXI Ixh	41.89	Cooxupe Cerrado BRA	42.35
				Nestle HQ	40.98	Ecom CTCA Lgi	41.89	Neumann KG COLB Hui	42.35
				FNC COLB Cau	40.98	Ecom CTCA Oro	41.89	Ecom CTCA Lgi	41.88
				FNC COLB Nar	40.98	Volcafé CTCA Sdo	41.89	Ecom CTCA Oro	41.88
						Efico	41.33	FNC COLB Cau	41.88
						Expocafé COLB Cal	41.33	FNC COLB Nar	41.88
						Nestle HQ	40.79	Volcafé CTCA	41.88
						FNC COLB Cau	39.24	Ecom GALA Hue	41.38
						FNC COLB Nar	39.24	Ecom MEXI Ixh	41.38
						Technoserve COLB	34.44	Volcafé CTCA Sdo	41.38
								Technoserve HQ	40.91
								Neumann KG HQ	40.00
								Volcafé HQ	40.00
								Efico	39.50
								Nestle HQ	38.30

6.10.4 Cliques found in the networks

AAA Sustainability Network (R)

2003

```

ow partition:
olumn partition:
nput dataset:      cliquesetsR2003 (C:\Documents and

```

		1	2	3	4	5	6	7
1	Goodbrand	1	1	0	0	0	0	0
2	FundaNatura COLB	0	0	1	0	1	0	0
3	Rainforest Alliance CTCA	0	0	1	1	0	0	1
4	Rainforest Alliance HQ	1	1	1	1	0	0	0
5	Nespresso HQ	1	1	1	1	1	1	0
6	Nestle HQ	0	0	0	0	0	0	0
7	Ecom CTCA	1	0	0	1	0	0	1
8	Ecom HQ	1	0	0	0	0	0	0
9	Ecom CTCA Lgi	0	0	0	0	0	0	1
10	Expocafé COLB	0	0	0	0	1	1	0
11	Expocafé-Cafexport	0	1	0	0	0	1	0

2004

Columns to display: all
 Column partition:
 Input dataset: CliquesetsR2004 (C:\Documents and se

		1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	Goodbrand	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0
2	FIIT GALA	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0
3	FundaNatura COLB	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
4	Imaflora BRA	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5	Pro Natura Sud MEXI	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
6	Rainforest Alliance CTCA	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
7	Rainforest Alliance HQ	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
8	Nespresso HQ	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
9	Nestle HQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Cooxupe Cerrado BRA	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
11	Ecom CTCA	0	1	1	0	0	0	1	0	0	0	0	0	1	1	0	0
12	Ecom GALA	0	0	0	0	0	1	1	0	0	1	0	0	1	0	0	0
13	Ecom HQ	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0
14	Ecom GALA Hue	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
15	Ecom MEXI Ixh	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
16	Ecom CTCA Lgi	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
17	Ecom MEXI	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
18	Efico	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
19	Expocafé COLB Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
20	Expocafé COLB	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
21	Expocafé-Cafexport	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1

2005

Columns to display: all
 Row partition:
 Column partition:
 Input dataset: CliquesetsR2005 (C:\Documents and Settings\All use

		1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
1	Goodbrand	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	FIIT GALA	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
3	FundaNatura COLB	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	1
4	Imaflora BRA	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5	Pro Natura Sud MEXI	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0
6	Rainforest Alliance CTCA	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0
7	Rainforest Alliance HQ	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
8	Nespresso HQ	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
9	Nestle HQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Nespresso CTCA	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0
11	Cooxupe Cerrado BRA	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Ecom CTCA	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0
13	Ecom GALA	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0
14	Ecom HQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
15	Ecom GALA Hue	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16	Ecom MEXI Ixh	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
17	Ecom CTCA Lgi	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
18	Ecom MEXI	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0
19	Efico	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	Expocafé COLB Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
21	Expocafé COLB	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0
22	Expocafé-Cafexport	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
23	FNC COLB Cau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
24	FNC COLB	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
25	FNC EUR	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
26	FNC COLB Nar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

2006

olumn partition:
nput dataset:

CliquesetsR2006 (C:\Documents and Settings\All User

		1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	2	2	2	2	2	
1	Goodbrand	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	Technoserve COLB	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	Technoserve HQ	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	FIIT GALA	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	FundaNatura COLB	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	
6	Imaflora BRA	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	Pro Natura Sud MEXI	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
8	Rainforest Alliance CTCA	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	
9	Rainforest Alliance HQ	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	Nespresso HQ	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	Nestle HQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	Nespresso CTCA	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	
13	Cooxupe Cerrado BRA	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	Ecom CTCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	
15	Ecom GALA	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	1	1	0	0	
16	Ecom HQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
17	Ecom GALA Hue	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	Ecom MEXI Ixh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
19	Ecom CTCA Lgi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
20	Ecom MEXI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	
21	Ecom CTCA Oro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
22	Efico	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
23	Expocafé COLB Ca1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
24	Expocafé COLB	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
25	Expocafé-Cafexport	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
26	FNC COLB Cau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
27	FNC COLB	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
28	FNC EUR	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	FNC COLB Nar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
30	Volcafé CTCA	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
31	Volcafé HQ	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	Volcafé CTCA Sdo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

2007

ow partition:
olumn partition:
nput dataset:

CliquesetsR2007 (C:\Documents and Settings\All Users\Docur

		1	2	3	4	5	6	7	8	9	0	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
1	Goodbrand	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2	Technoserve COLB	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Technoserve HQ	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	IFC	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	FIIT GALA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
6	FundaNatura COLB	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
7	Imaflora BRA	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8	Pro Natura Sud MEXI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0
9	Rainforest Alliance CTCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0
10	Rainforest Alliance HQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0
11	Nespresso HQ	0	0	0	0	0	0	0	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
12	Nestle HQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Nespresso CTCA	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	1	0	0
14	Nespresso COLB	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Cooxupe Cerrado BRA	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	Ecom CTCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	1	1	0
17	Ecom GALA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0
18	Ecom HQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
19	Ecom GALA Hue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
20	Ecom MEXI Ixh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
21	Ecom CTCA Lgi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
22	Ecom MEXI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
23	Ecom CTCA Oro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
24	Efico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	Expocafé COLB Ca1	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	Expocafé COLB	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	Expocafé-Cafexport	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	FNC COLB Cau	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	FNC COLB	1	1	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	FNC EUR	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	FNC COLB Nar	0	0	1	0	0	0																						

Commercial Network (C)

2002

olumn partition:
nput dataset: cliquesetsC2002 (C

		1	2	3	4	5	6	7	8
		-	-	-	-	-	-	-	-
1	Goodbrand	0	0	0	0	0	0	0	0
2	Nespresso HQ	1	1	1	1	1	1	1	0
3	Nestle HQ	1	1	1	1	1	1	0	1
4	Cooxupe Cerrado BRA	0	0	0	1	0	0	0	0
5	Ecom CTCA	1	0	0	0	0	0	0	0
6	Ecom GALA	0	1	0	0	0	0	0	0
7	Ecom HQ	1	1	1	0	0	0	0	0
8	Ecom GALA Hue	0	0	0	0	0	0	0	0
9	Ecom MEXI Ixh	0	0	0	0	0	0	0	0
10	Ecom CTCA Lgi	0	0	0	0	0	0	0	0
11	Ecom MEXI	0	0	1	0	0	0	0	0
12	Ecom CTCA Oro	0	0	0	0	0	0	0	0
13	Efico	0	0	0	1	0	0	0	0
14	Expocafé COLB Cal	0	0	0	0	0	0	0	0
15	Expocafé COLB	0	0	0	0	0	0	1	0
16	Expocafé-Cafexport	0	0	0	0	0	0	1	0
17	FNC COLB Cau	0	0	0	0	0	0	0	0
18	FNC COLB	0	0	0	0	0	0	0	1
19	FNC EUR	0	0	0	0	0	0	0	1
20	FNC COLB Nar	0	0	0	0	0	0	0	0
21	Neumann KG COLB	0	0	0	0	1	0	0	0
22	Neumann KG HQ	0	0	0	0	1	0	0	0
23	Neumann KG COLB Hui	0	0	0	0	0	0	0	0
24	Volcafé CTCA	0	0	0	0	0	1	0	0
25	Volcafé HQ	0	0	0	0	0	1	0	0
26	Volcafé CTCA Sdo	0	0	0	0	0	0	0	0

2003

ow partition:
olumn partition:
nput dataset: cliquesetsC2003 (C

		1	2	3	4	5	6	7	8
		-	-	-	-	-	-	-	-
1	Goodbrand	0	0	0	0	0	0	0	0
2	Nespresso HQ	1	1	1	1	1	1	1	1
3	Nestle HQ	1	1	1	1	1	1	1	0
4	Cooxupe Cerrado BRA	0	0	0	1	0	0	0	0
5	Ecom CTCA	1	0	0	0	0	0	0	0
6	Ecom GALA	0	1	0	0	0	0	0	0
7	Ecom HQ	1	1	1	0	0	0	0	0
8	Ecom GALA Hue	0	0	0	0	0	0	0	0
9	Ecom MEXI Ixh	0	0	0	0	0	0	0	0
10	Ecom CTCA Lgi	0	0	0	0	0	0	0	0
11	Ecom MEXI	0	0	1	0	0	0	0	0
12	Ecom CTCA Oro	0	0	0	0	0	0	0	0
13	Efico	0	0	0	1	0	0	0	0
14	Expocafé COLB Cal	0	0	0	0	0	0	0	0
15	Expocafé COLB	0	0	0	0	0	0	1	0
16	Expocafé-Cafexport	0	0	0	0	0	0	1	0
17	FNC COLB Cau	0	0	0	0	0	0	0	0
18	FNC COLB	0	0	0	0	1	0	0	0
19	FNC EUR	0	0	0	0	1	0	0	0
20	FNC COLB Nar	0	0	0	0	0	0	0	0
21	Neumann KG COLB	0	0	0	0	0	1	0	0
22	Neumann KG HQ	0	0	0	0	0	1	0	0
23	Neumann KG COLB Hui	0	0	0	0	0	0	0	0
24	Volcafé CTCA	0	0	0	0	0	0	1	0
25	Volcafé HQ	0	0	0	0	0	0	1	0
26	Volcafé CTCA Sdo	0	0	0	0	0	0	0	0

2005

row partition:

input dataset:

CliquesetsC2005 (C

		1	2	3	4	5	6	7	8
		-	-	-	-	-	-	-	-
1	Nespresso HQ	1	1	1	1	1	1	1	1
2	Nestle HQ	1	1	1	1	1	1	1	0
3	Cooxupe Cerrado BRA	0	0	0	1	0	0	0	0
4	Ecom CTCA	1	0	0	0	0	0	0	0
5	Ecom GALA	0	1	0	0	0	0	0	0
6	Ecom HQ	1	1	1	0	0	0	0	0
7	Ecom GALA Hue	0	0	0	0	0	0	0	0
8	Ecom MEXI Ixh	0	0	0	0	0	0	0	0
9	Ecom CTCA Lgi	0	0	0	0	0	0	0	0
10	Ecom MEXI	0	0	1	0	0	0	0	0
11	Ecom CTCA Oro	0	0	0	0	0	0	0	0
12	Efico	0	0	0	1	0	0	0	0
13	Expocafé COLB Cal	0	0	0	0	0	0	0	0
14	Expocafé COLB	0	0	0	0	0	0	0	1
15	Expocafé-Cafexport	0	0	0	0	0	0	0	1
16	FNC COLB Cau	0	0	0	0	0	0	0	0
17	FNC COLB	0	0	0	0	1	0	0	0
18	FNC EUR	0	0	0	0	1	0	0	0
19	FNC COLB Nar	0	0	0	0	0	0	0	0
20	Neumann KG COLB	0	0	0	0	0	1	0	0
21	Neumann KG HQ	0	0	0	0	0	1	0	0
22	Neumann KG COLB Hui	0	0	0	0	0	0	0	0
23	volcafé CTCA	0	0	0	0	0	0	1	0
24	volcafé HQ	0	0	0	0	0	0	1	0
25	volcafé CTCA sdo	0	0	0	0	0	0	0	0

matrix has 25 rows, 8 columns, and 1 levels.

2007

row partition:

column partition:

input dataset:

CliquesetsC2007 (C

		1	2	3	4	5	6	7	8
		-	-	-	-	-	-	-	-
1	Nespresso HQ	1	1	1	1	1	1	1	1
2	Nestle HQ	1	1	1	1	1	1	1	0
3	Cooxupe Cerrado BRA	0	0	0	1	0	0	0	0
4	Ecom CTCA	1	0	0	0	0	0	0	0
5	Ecom GALA	0	1	0	0	0	0	0	0
6	Ecom HQ	1	1	1	0	0	0	0	0
7	Ecom GALA Hue	0	0	0	0	0	0	0	0
8	Ecom MEXI Ixh	0	0	0	0	0	0	0	0
9	Ecom CTCA Lgi	0	0	0	0	0	0	0	0
10	Ecom MEXI	0	0	1	0	0	0	0	0
11	Ecom CTCA Oro	0	0	0	0	0	0	0	0
12	Efico	0	0	0	1	0	0	0	0
13	Expocafé COLB Cal	0	0	0	0	0	0	0	0
14	Expocafé COLB	0	0	0	0	0	0	0	1
15	Expocafé-Cafexport	0	0	0	0	0	0	0	1
16	FNC COLB Cau	0	0	0	0	0	0	0	0
17	FNC COLB	0	0	0	0	1	0	0	0
18	FNC EUR	0	0	0	0	1	0	0	0
19	FNC COLB Nar	0	0	0	0	0	0	0	0
20	Neumann KG COLB	0	0	0	0	0	1	0	0
21	Neumann KG HQ	0	0	0	0	0	1	0	0
22	Neumann KG COLB Hui	0	0	0	0	0	0	0	0
23	volcafé CTCA	0	0	0	0	0	0	1	0
24	volcafé HQ	0	0	0	0	0	0	1	0
25	volcafé CTCA sdo	0	0	0	0	0	0	0	0

Personal Network (P)

2002

column partition:
 input dataset: cliquesetsP2002 (C:\Document:

		1	2	3	4	5	6	7
1	Goodbrand	0	0	0	0	0	0	0
2	FIIT GALA	0	0	0	0	1	0	0
3	FundaNatura COLB	0	0	0	0	1	0	0
4	Imaflora BRA	0	0	0	0	1	0	0
5	Pro Natura Sud MEXI	0	0	0	0	1	0	0
6	Rainforest Alliance CTCA	0	0	0	0	1	0	0
7	Rainforest Alliance HQ	0	0	0	0	1	0	0
8	Nespresso HQ	0	1	1	0	0	0	0
9	Cooxupe Cerrado BRA	0	0	0	0	0	0	0
10	Ecom CTCA	0	0	0	0	0	1	1
11	Ecom GALA	0	0	0	0	0	1	0
12	Ecom HQ	0	0	0	0	0	1	0
13	Ecom GALA Hue	0	0	0	0	0	0	0
14	Ecom MEXI Ixh	0	0	0	0	0	0	0
15	Ecom CTCA Lgi	0	0	0	0	0	0	1
16	Ecom MEXI	0	0	0	0	0	1	0
17	Ecom CTCA Oro	0	0	0	0	0	0	1
18	Efico	0	0	0	0	0	0	0
19	Expocafé COLB Cal	1	0	0	0	0	0	0
20	Expocafé COLB	1	1	0	0	0	0	0
21	Expocafé-Cafexport	1	1	1	0	0	0	0
22	FNC COLB Cau	0	0	0	1	0	0	0
23	FNC COLB	1	1	1	1	0	0	0
24	FNC EUR	0	0	1	0	0	0	0
25	FNC COLB Nar	0	0	0	1	0	0	0
26	Neumann KG COLB	0	0	0	0	0	0	0
27	Neumann KG HQ	0	0	0	0	0	0	0
28	Neumann KG COLB Huí	0	0	0	0	0	0	0
29	Volcafé CTCA	0	0	0	0	0	0	0
30	volcafé CTCA Sdo	0	0	0	0	0	0	0

2004

column partition:
 input dataset: cliquesetsP2004 (C

		1	2	3	4	5	6	7	8
1	Goodbrand	0	0	0	0	0	0	0	0
2	FIIT GALA	0	0	0	1	0	0	0	0
3	FundaNatura COLB	0	0	0	1	0	0	0	0
4	Imaflora BRA	0	0	0	1	0	0	0	0
5	Pro Natura Sud MEXI	0	0	0	1	0	0	0	0
6	Rainforest Alliance CTCA	0	0	0	1	0	0	0	0
7	Rainforest Alliance HQ	0	0	0	1	0	0	0	0
8	Nespresso HQ	1	1	1	0	0	0	0	0
9	Cooxupe Cerrado BRA	0	0	0	0	0	0	0	0
10	Ecom CTCA	0	0	1	0	1	1	0	0
11	Ecom GALA	0	0	0	0	1	0	0	0
12	Ecom HQ	0	0	1	0	1	0	0	0
13	Ecom GALA Hue	0	0	0	0	0	0	0	0
14	Ecom MEXI Ixh	0	0	0	0	0	0	0	0
15	Ecom CTCA Lgi	0	0	0	0	0	1	0	0
16	Ecom MEXI	0	0	0	0	1	0	0	0
17	Ecom CTCA Oro	0	0	0	0	0	1	0	0
18	Efico	0	0	0	0	0	0	0	0
19	Expocafé COLB Cal	0	0	0	0	0	0	1	0
20	Expocafé COLB	1	0	0	0	0	0	1	0
21	Expocafé-Cafexport	1	1	0	0	0	0	1	0
22	FNC COLB Cau	0	0	0	0	0	0	0	1
23	FNC COLB	1	1	0	0	0	0	1	1
24	FNC EUR	0	1	0	0	0	0	0	0
25	FNC COLB Nar	0	0	0	0	0	0	0	1
26	Neumann KG COLB	0	0	0	0	0	0	0	0
27	Neumann KG HQ	0	0	0	0	0	0	0	0
28	Neumann KG COLB Huí	0	0	0	0	0	0	0	0
29	Volcafé CTCA	0	0	0	0	0	0	0	0
30	volcafé CTCA Sdo	0	0	0	0	0	0	0	0

2005

column partition:
input dataset: cliquesetsP2005 (C

		1	2	3	4	5	6	7	8
1	Goodbrand	0	0	0	0	0	0	0	0
2	FIIT GALA	0	0	0	1	0	0	0	0
3	FundaNatura COLB	0	0	0	1	0	0	0	0
4	Imaflora BRA	0	0	0	1	0	0	0	0
5	Pro Natura Sud MEXI	0	0	0	1	0	0	0	0
6	Rainforest Alliance CTCA	0	0	0	1	0	0	0	0
7	Rainforest Alliance HQ	0	0	0	1	0	0	0	0
8	Nespresso HQ	1	1	1	0	0	0	0	0
9	Cooxupe Cerrado BRA	0	0	0	0	0	0	0	0
10	Ecom CTCA	0	0	1	0	1	1	0	0
11	Ecom GALA	0	0	0	0	1	0	0	0
12	Ecom HQ	0	0	1	0	1	0	0	0
13	Ecom GALA Hue	0	0	0	0	0	0	0	0
14	Ecom MEXI Ixh	0	0	0	0	0	0	0	0
15	Ecom CTCA Lgí	0	0	0	0	0	1	0	0
16	Ecom MEXI	0	0	0	0	1	0	0	0
17	Ecom CTCA Oro	0	0	0	0	0	1	0	0
18	Efico	0	0	0	0	0	0	0	0
19	Expocafé COLB Caí	0	0	0	0	0	0	1	0
20	Expocafé COLB	1	0	0	0	0	0	1	0
21	Expocafé-Cafexport	1	1	0	0	0	0	1	0
22	FNC COLB Cau	0	0	0	0	0	0	0	1
23	FNC COLB	1	1	0	0	0	0	1	1
24	FNC EUR	0	1	0	0	0	0	0	0
25	FNC COLB Nar	0	0	0	0	0	0	0	1
26	Neumann KG COLB	0	0	0	0	0	0	0	0
27	Neumann KG HQ	0	0	0	0	0	0	0	0
28	Neumann KG COLB Huí	0	0	0	0	0	0	0	0
29	Volcafé CTCA	0	0	0	0	0	0	0	0
30	Volcafé CTCA Sdo	0	0	0	0	0	0	0	0

2006

column partition:
input dataset: cliquesetsP2006 (C:\Docum

		1	2	3	4	5	6	7	8	9	10	11	12
1	Goodbrand	0	0	0	0	0	0	0	0	0	0	0	0
2	FIIT GALA	0	0	0	1	0	0	0	0	0	0	0	0
3	FundaNatura COLB	0	0	0	1	0	0	0	0	0	0	0	0
4	Imaflora BRA	0	0	0	1	0	0	0	0	0	0	0	0
5	Pro Natura Sud MEXI	0	0	0	1	0	0	0	0	0	0	0	0
6	Rainforest Alliance CTCA	0	0	0	1	0	0	0	0	0	0	0	0
7	Rainforest Alliance HQ	0	0	0	1	0	0	0	0	0	0	0	0
8	Nespresso HQ	1	1	1	0	0	0	0	0	0	0	0	0
9	Nespresso CTCA	0	0	0	0	1	1	1	1	0	0	0	0
10	Cooxupe Cerrado BRA	0	0	0	0	0	0	0	0	0	0	0	0
11	Ecom CTCA	0	0	1	0	1	1	0	0	1	1	0	0
12	Ecom GALA	0	0	0	0	1	0	1	0	1	0	0	0
13	Ecom HQ	0	0	1	0	0	0	0	0	1	0	0	0
14	Ecom GALA Hue	0	0	0	0	0	0	1	0	0	0	0	0
15	Ecom MEXI Ixh	0	0	0	0	0	0	0	1	0	0	0	0
16	Ecom CTCA Lgí	0	0	0	0	0	1	0	0	0	1	0	0
17	Ecom MEXI	0	0	0	0	1	0	0	1	1	0	0	0
18	Ecom CTCA Oro	0	0	0	0	0	0	0	0	0	1	0	0
19	Efico	0	0	0	0	0	0	0	0	0	0	0	0
20	Expocafé COLB Caí	0	0	0	0	0	0	0	0	0	0	1	0
21	Expocafé COLB	1	0	0	0	0	0	0	0	0	0	1	0
22	Expocafé-Cafexport	1	1	0	0	0	0	0	0	0	0	1	0
23	FNC COLB Cau	0	0	0	0	0	0	0	0	0	0	0	1
24	FNC COLB	1	1	0	0	0	0	0	0	0	0	1	1
25	FNC EUR	0	1	0	0	0	0	0	0	0	0	0	0
26	FNC COLB Nar	0	0	0	0	0	0	0	0	0	0	0	1
27	Neumann KG COLB	0	0	0	0	0	0	0	0	0	0	0	0
28	Neumann KG HQ	0	0	0	0	0	0	0	0	0	0	0	0
29	Neumann KG COLB Huí	0	0	0	0	0	0	0	0	0	0	0	0
30	Volcafé CTCA	0	0	0	0	0	0	0	0	0	0	0	0
31	Volcafé CTCA Sdo	0	0	0	0	0	0	0	0	0	0	0	0

6.10.5 Ego-nets and brokerage opportunities

AAA Sustainability Network

AAA Network - Ego Net measures by stage for all actors

	Degree					Constraint					Normalized Brokerage				
	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
Goodbrand	5.0	7.0	2.0	3.0	4.0	0.63	0.46	1.13	0.84	0.68	0.10	0.24		0.17	0.25
Technoserve COLB				4.0	6.0				0.58	0.46				0.25	0.23
Technoserve HQ				3.0	3.0				0.61	0.61				0.33	0.33
IFC					4.0					0.64					0.25
FIIT GALA		8.0	8.0	8.0	8.0		0.40	0.40	0.40	0.40		0.20	0.23	0.23	0.23
FundaNatura COLB	4.0	8.0	11.0	11.0	13.0	0.70	0.40	0.27	0.27	0.26	0.17	0.20	0.35	0.35	0.35
Imaflora BRA		7.0	7.0	7.0	7.0		0.47	0.45	0.45	0.44		0.12	0.19	0.19	0.21
Pro Natura Sud MEXI		8.0	8.0	8.0	8.0		0.39	0.40	0.40	0.40		0.21	0.23	0.23	0.23
Rainforest Alliance CTCA	5.0	8.0	8.0	11.0	11.0	0.58	0.41	0.40	0.30	0.30	0.20	0.18	0.23	0.32	0.32
Rainforest Alliance HQ	7.0	10.0	7.0	7.0	7.0	0.46	0.34	0.45	0.45	0.42	0.21	0.23	0.19	0.19	0.24
Nespresso HQ	9.0	15.0	13.0	16.0	13.0	0.33	0.21	0.18	0.15	0.17	0.31	0.34	0.44	0.45	0.46
Nestle HQ	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00	1.00	1.00					
Nespresso CTCA			10.0	13.0	14.0			0.29	0.25	0.22			0.33	0.37	0.38
Nespresso COLB					15.0					0.21					0.39
Cooxupe Cerrado BRA		4.0	3.0	3.0	3.0		0.70	0.84	0.84	0.61		0.17	0.17	0.17	0.33
Ecom CTCA	6.0	8.0	6.0	7.0	8.0	0.51	0.39	0.50	0.44	0.38	0.20	0.27	0.23	0.26	0.30
Ecom GALA		6.0	6.0	6.0	6.0		0.48	0.50	0.50	0.50		0.27	0.23	0.23	0.23
Ecom HQ	4.0	6.0	4.0	4.0	5.0	0.77	0.53	0.58	0.58	0.55		0.17	0.25	0.25	0.25
Ecom GALA Hue		2.0	3.0	3.0	3.0		1.13	0.93	0.93	0.93					
Ecom MEXI Ixh		2.0	3.0	3.0	3.0		1.13	0.93	0.93	0.93					
Ecom CTCA Lgi	2.0	2.0	3.0	3.0	3.0	1.13	1.13	0.93	0.93	0.93					
Ecom MEXI		5.0	6.0	6.0	6.0		0.51	0.50	0.50	0.50		0.30	0.23	0.23	0.23
Ecom CTCA Oro				3.0	3.0				0.93	0.93					
Efico		3.0	2.0	2.0	2.0		0.93	1.13	1.13	0.50					0.50
Expocafé COLB Cal		3.0	3.0	4.0	6.0		0.84	0.84	0.70	0.54		0.17	0.17	0.17	0.13
Expocafé COLB	3.0	4.0	4.0	5.0	5.0	0.84	0.69	0.69	0.58	0.63	0.17	0.17	0.17	0.20	0.10
Expocafé-Cafexport	4.0	5.0	3.0	4.0	5.0	0.70	0.55	0.84	0.70	0.61	0.17	0.25	0.17	0.17	0.15
FNC COLB Cau			2.0	2.0	3.0			1.13	1.13	0.93					
FNC COLB			5.0	5.0	7.0			0.54	0.54	0.46			0.30	0.30	0.26
FNC EUR			2.0	2.0	3.0			1.13	1.13	0.84					0.17
FNC COLB Nar			2.0	2.0	3.0			1.13	1.13	0.93					
Neumann KG COLB					4.0					0.58					0.25
Neumann KG HQ					2.0					0.50					0.50
Neumann KG COLB Hui					3.0					0.93					
Volcafé CTCA				5.0	4.0				0.55	0.58				0.25	0.25
Volcafé HQ				2.0	2.0				1.13	0.50					0.50
Volcafé CTCA Sdo				3.0	3.0				0.93	0.93					

Commercial Network

Commercial Network - Ego Net measures by stage for all actors

	Degree			Effective Size			Constraint			Normalized Brokerage		
	->2002	2003	2004-07	->2002	2003	2004-07	-> 2002	2003	2004-2007	-> 2002	2003	2004-07
Goodbrand	1.0			1.00	1.00		1.00	1.00				
Technoserve COLB		1.0										
Technoserve HQ												
IFC												
FIIT GALA												
FundaNatura COLB												
Imaflora BRA												
Pro Natura Sud MEXI												
Rainforest Alliance CTCA												
Rainforest Alliance HQ												
Nespresso HQ	14.0	16.0	15.0	11.57	13.50	12.33	0.23	0.21	0.24	0.41	0.42	0.40
Nestle HQ	13.0	13.0	13.0	10.38	10.10	10.10	0.26	0.29	0.29	0.39	0.38	0.38
Nespresso CTCA												
Nespresso COLB												
Cooxupe Cerrado BRA	3.0	3.0	3.0	1.0	1.0	1.0	0.926	0.926	0.93			
Ecom CTCA	5.0	5.0	5.0	3.80	3.80	3.80	0.41	0.41	0.41	0.35	0.35	0.35
Ecom GALA	4.0	4.0	4.0	2.5	2.5	2.5	0.58	0.58	0.58	0.25	0.25	0.25
Ecom HQ	5.0	5.0	5.0	2.20	2.20	2.20	0.62	0.62	0.62	0.15	0.15	0.15
Ecom GALA Hue	1.0	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00			
Ecom MEXI Ixh	1.0	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00			
Ecom CTCA Lgi	1.0	1.0	1.0	1.00	1.00	1.00	1.00	1.00	1.00			
Ecom MEXI	4.0	4.0	4.0	2.5	2.5	2.5	0.58	0.58	0.58	0.25	0.25	0.25
Ecom CTCA Oro	1.0	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00			
Efico	3.0	3.0	3.0	1.0	1.0	1.0	0.93	0.93	0.93			
Expocafé COLB Cal	1.0	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00			
Expocafé COLB	3.0	3.0	3.0	2.33	2.33	2.33	0.61	0.61	0.61	0.33	0.33	0.33
Expocafé-Cafexport	2.0	2.0	2.0	1.00	1.00	1.00	1.13	1.13	1.13			
FNC COLB Cau	1.0	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00			
FNC COLB	4.0	5.0	5.0	3.5	3.8	3.8	0.41	0.41	0.41	0.42	0.35	0.35
FNC EUR	2.0	3.0	3.0	1.0	1.0	1.0	1.13	0.93	0.93			
FNC COLB Nar	1.0	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00			
Neumann KG COLB	4.0	4.0	4.0	2.5	2.5	2.5	0.58	0.58	0.58	0.25	0.25	0.25
Neumann KG HQ	3.0	3.0	3.0	1.0	1.0	1.0	0.93	0.93	0.93			
Neumann KG COLB Hui	1.0	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00			
Volcafé CTCA	4.0	4.0	4.0	2.5	2.5	2.5	0.58	0.58	0.58	0.25	0.25	0.25
Volcafé HQ	3.0	3.0	3.0	1.0	1.0	1.0	0.93	0.93	0.93			
Volcafé CTCA Sdo	1.0	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00			

Personal Network

Personal Network - Ego Net measures by stage for all actors

	Degree					Constraint					Normalized Brokerage				
	2002-03	2004	2005	2006	2007	2002-03	2004	2005	2006	2007	2002-03	2004	2005	2006	2007
Goodbrand	1.0	1.0	2.0	2.0	2.0	1.00	1.00	0.50	0.50	0.50			0.50	0.50	0.50
Technoserve COLB															
Technoserve HQ															
IFC															
FIIT GALA	5.0	5.0	5.0	5.0	5.0	0.65	0.65	0.65	0.65	0.65					
FundaNatura COLB	5.0	5.0	5.0	5.0	7.0	0.65	0.65	0.65	0.65	0.37					0.26
Imaflora BRA	5.0	5.0	5.0	5.0	5.0	0.65	0.65	0.65	0.65	0.65					
Pro Natura Sud MEXI	5.0	5.0	5.0	5.0	5.0	0.65	0.65	0.65	0.65	0.65					
Rainforest Alliance CTCA	5.0	5.0	5.0	5.0	5.0	0.65	0.65	0.65	0.65	0.65					
Rainforest Alliance HQ	5.0	5.0	6.0	6.0	6.0	0.65	0.65	0.48	0.48	0.48			0.17	0.17	0.17
Nespresso HQ	5.0	7.0	7.0	7.0	7.0	0.51	0.35	0.35	0.35	0.35	0.25	0.36	0.36	0.36	0.36
Nestle HQ															
Nespresso CTCA				6.0	7.0				0.46	0.41				0.30	0.31
Nespresso COLB					1.0										
Cooxupe Cerrado BRA	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00	1.00	1.00					
Ecom CTCA	5.0	6.0	6.0	7.0	7.0	0.51	0.44	0.44	0.41	0.41	0.30	0.33	0.33	0.31	0.29
Ecom GALA	4.0	4.0	4.0	5.0	5.0	0.58	0.58	0.58	0.58	0.58	0.25	0.25	0.25	0.20	0.20
Ecom HQ	3.0	4.0	4.0	4.0	4.0	0.93	0.70	0.70	0.70	0.70		0.17	0.17	0.17	0.17
Ecom GALA Hue	1.0	1.0	1.0	2.0	2.0	1.00	1.00	1.00	1.13	1.13					
Ecom MEXI Ixh	1.0	1.0	1.0	2.0	2.0	1.00	1.00	1.00	1.13	1.13					
Ecom CTCA Lgi	2.0	2.0	2.0	3.0	3.0	0.50	1.13	1.13	0.84	0.93				0.17	
Ecom MEXI	4.0	4.0	4.0	5.0	5.0	0.63	0.58	0.58	0.58	0.58	0.25	0.25	0.25	0.20	0.20
Ecom CTCA Oro	2.0	2.0	2.0	2.0	3.0	1.13	1.13	1.13	1.13	0.93					
Efico	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00	1.00	1.00					
Expocafé COLB Cal	3.0	3.0	3.0	3.0	3.0	0.93	0.93	0.93	0.93	0.93					
Expocafé COLB	4.0	4.0	4.0	4.0	4.0	0.74	0.74	0.74	0.74	0.74	0.08	0.08	0.08	0.08	0.08
Expocafé-Cafexport	5.0	5.0	5.0	5.0	5.0	0.61	0.61	0.61	0.61	0.61	0.15	0.15	0.15	0.15	0.15
FNC COLB Cau	2.0	2.0	2.0	2.0	2.0	1.13	1.13	1.13	1.13	1.13					
FNC COLB	7.0	7.0	7.0	7.0	7.0	0.40	0.40	0.40	0.40	0.40	0.31	0.31	0.31	0.31	0.31
FNC EUR	3.0	3.0	3.0	3.0	3.0	0.93	0.93	0.93	0.93	0.93					
FNC COLB Nar	2.0	2.0	2.0	2.0	2.0	1.13	1.13	1.13	1.13	1.13					
Neumann KG COLB	2.0	2.0	2.0	2.0	2.0	0.50	0.50	0.50	0.50	0.33	0.50	0.50	0.50	0.50	0.50
Neumann KG HQ	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00	1.00	1.00					
Neumann KG COLB Hui	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00	1.00	1.00					
Volcafé CTCA	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00	1.00	1.00					
Volcafé HQ															
Volcafé CTCA Sdo	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00	1.00	1.00					

7 Scoping Study

8 Appendix: Publications accepted or published by January 1st, 2010

Academic Journal

Alvarez, G., Wilding, R. and Pilbeam, C. (2010), "Nestlé Nespresso AAA sustainable quality program: An investigation into the governance dynamics in a multistakeholder sustainable supply chain network ", *Supply Chain Management: An International Journal*, forthcoming.

Book Chapter

Alvarez, G. (2010), "Fair trade and beyond: Voluntary standards and sustainable supply chains (forthcoming)", in Mena, C. and Stevens, G. (eds.) *Delivering performance in food supply chains*, Woodhead Publishing Limited, Cambridge, UK, pp. 478-510.

Conference Papers

Alvarez, G. and Wilding, R. (2007), "Sustainability and Quality: The creation and operation of multi-stakeholder networks in ethical supply chains", in Lalwani, C., Mangan, J., Butcher, T., et al (eds.), *Logistics Research Network 2007 Conference Proceedings*, Vol. 1, August 2007, Kingston Upon Hull, The Chartered Institute of Logistics and Transport (UK), Corby, Nothans, UK, pp. 353.

Alvarez, G. and Wilding, R. (2008), "Governance mechanisms dynamics in a multi-stakeholder network: The case of Nespresso AAA Sustainable Quality Program", *BAM 2008: The Academy goes relevant*, 9-11 September 2008, Harrogate, British Academy of Management, London