



Contents lists available at ScienceDirect

Industrial Marketing Management

journal homepage: www.elsevier.com/locate/indmarman

A framework for understanding strategic network performance: Exploring efficiency and effectiveness at the network level

Lyndie Bayne, Daniel Schepis, Sharon Purchase*

UWA Business School, 35 Stirling Highway, Nedlands 6009, Australia

ARTICLE INFO

Keywords:

Strategic networks
Performance
Efficiency
Effectiveness
Processes

ABSTRACT

There are currently limits in our understanding of strategic network performance due to the complexity of the underlying processes involved. Improving our understanding of performance is critical if we are to improve network functioning, an important managerial problem. This paper addresses a research gap in strategic network performance by investigating: efficiency and effectiveness at the network level of analysis. A multiple case study methodology is used to investigate two Australian agri-business strategic networks. The cases suggest that processes relating to building actor webs and collective sensemaking are crucial for improving strategic network effectiveness, whereas network efficiency is influenced by developing activity patterns and utilizing resource constellations. The cases also highlight potential trade-offs between network effectiveness and efficiency in relation to performance at the network level. The paper contributes an empirically informed theoretical framework for understanding how network level processes influence network performance.

1. Introduction

We have long recognized that firms are able to generate value through collaborative network approaches, which can be considered a well-established aspect of managerial strategy (Jarillo, 1988; Majava, Isoherranen, & Kess, 2013). While a plethora of studies have focused on evaluating the effects of networks on firm performance, very few address the performance of the network itself (Corsaro, Ramos, Henneberg, & Naudé, 2012). This paper takes up the call from Möller and Svahn (2003, p.227) who highlight that “empirical research is required to deepen and validate ... management and assessment of the performance of different nets”. However, evaluating network performance has been recognized as extremely complex and context dependent, contributing to our lack of understanding at this level (Provan & Kenis, 2008; Ferreira, Shamsuzzoha, Toscano, & Cunha, 2012; Möller & Svahn, 2003). Part of this issue stems from difficulties in identifying the processes to be evaluated, given perceptions often vary among participating firms and these may even evolve as the network develops (Lind, 2015). Despite these challenges, understanding performance at the network level has valuable managerial applications and can improve network functioning to achieve desired goals (Provan & Kenis, 2008).

Understanding performance is of particular interest to firms engaging in *strategic networks*, which are intentionally constructed by groups of actors to attain specific objectives and place emphasis on the

management of collaborative processes (Möller & Svahn, 2003; Heikkinen, Mainela, Still, & Tahtinen, 2007; Huxham & Vangen, 2005). This form of network structure, distinguished from emergent networks, features across different theoretical perspectives, varying in name and application, however similarly interested in the issue of evaluating performance (Provan & Milward, 1995; Gulati, Nohria, & Zaheer, 2000; Corsaro et al., 2012). As Rampersad, Quester, and Troshani (2010) highlight, the strategic network level, which seeks to link managerial factors with network level outcomes, remains empirically undeveloped. As with approaches for evaluating organizational performance however, managers may interpret network performance in terms of its functioning and/or its perceived outcomes (Mouzas, 2006; Whelan, 2015). We understand network performance to align with network efficiency and effectiveness respectively (Möller & Svahn, 2003; Möller & Rajala, 2007; Jarillo, 1988; Provan & Kenis, 2008); while both relevant, no empirical frameworks have considered these concepts together to understand network performance.

This paper addresses this gap, by developing a framework to understand how strategic network processes contribute to efficiency and effectiveness and overall performance at the network level of analysis. In doing so we apply the Actors-Resources-Activities (ARA) model which identifies the processes of building actor webs, developing activity patterns and utilizing resource constellations, and include a collective sensemaking dimension of particular relevance to strategic networks (Håkansson & Snehota, 1995; Welch & Wilkinson, 2002).

* Corresponding author.

E-mail addresses: Lyndie.bayne@uwa.edu.au (L. Bayne), Daniel.schepis@uwa.edu.au (D. Schepis), Sharon.purchase@uwa.edu.au (S. Purchase).

<http://dx.doi.org/10.1016/j.indmarman.2017.07.015>

Received 1 April 2016; Received in revised form 15 June 2017; Accepted 28 July 2017
0019-8501/ © 2017 Elsevier Inc. All rights reserved.

These processes are investigated empirically through two case studies set in the Australian agri-business sector which focus on network level performance perceptions from multiple actor perspectives. In taking this approach we address the following research question: How do strategic network processes influence its performance at the network level?

The remainder of the paper is structured as follows. The theoretical background is presented in Section 2, followed by a summary of the conceptual development in Section 3. The methodology is outlined in Section 4, after which the cases are presented and analyzed in Section 5. Discussion follows in Section 6 and finally conclusions are provided in Section 7.

2. Theoretical background

This section explores concepts of performance in business networks and introduces an initial conceptual framework of network processes relevant to our study. As introduced earlier, we focus specifically on strategic networks, which are understood as intentionally constructed subsets of three or more actors purposefully collaborating towards specific goals (Möller & Svahn, 2003). While strategic networks have sometimes been considered long-term endeavors (Jarillo, 1988), we align with perspectives that suggest they are not necessarily ongoing and can dissolve once goals are achieved (Brito, 2001, Ritvala & Salmi, 2010). Strategic networks can be distinguished from broader, emergent networks based on their strategic intent and the specific context for actor interactions (Möller, Rajala, & Svahn, 2005). Despite the diverse application of the concept, strategic networks have also been classified by type based on commonalities, indicating more general analyses are appropriate (Möller & Svahn, 2003; Möller et al., 2005). Therefore the strategic network level provides a more suitable lens to consider performance given the greater goal specificity and a bounded analytical focus through which to analyze internal processes (Alajoutsijärvi, Möller, & Rosenbröjjer, 1999). This level of analysis offers opportunities to explore performance at the network level, given shared goals can to some extent offer a more coherent and identifiable perspective (Valkokari, 2015).

2.1. Strategic network performance

While acknowledging the lack of research directed at network level performance, several related perspectives of performance in networks can be considered to inform this research. In referring to strategic networks, Jarillo (1988) considers performance in terms of competitive advantages over non-participating firms or superior returns to what can be achieved alone. This perspective however, focuses on organizational performance, in particular for the controlling hub firm (Jarillo, 1988). Möller and Svahn (2003) take a value creation perspective, focusing on the value generated through participation in the strategic network, which is greater than what firms can achieve individually. Network performance has been studied extensively in public administration literature, although different performance measures are used and the empirical focus is often on broader community outcomes (Raab, Mannak, & Cambré, 2015). As an example, Turrini, Cristofoli, Frosini, and Nasi (2010) summarize network level performance evaluations as the ability to reach stated goals; innovation and change; and sustainability and viability.

This paper argues that performance perceptions vary according to: (1) different individual and organizational participants (Huxham & Vangen, 2005; Ford & Håkansson, 2006) and (2) type/contextual nature of the network (Möller & Svahn, 2003). As initially highlighted, evaluating performance at a network level is difficult as it raises the question “effectiveness for whom?” (Provan & Kenis, 2008, p. 229). This indicates that strategic network performance perceptions need to align with organizational actor requirements (Lind, 2015; Ritvala & Salmi, 2011), yet this is not necessarily achieved (see

Munksgaard & Medlin, 2014). Lind (2015) highlights numerous variations in which organizational (specific) goals are nested within strategic network (overall) goals, depending on how individual actors manage to pursue their individual goals. While multiple performance descriptors vary according to context and type, there remains a need to identify appropriate approaches to evaluating strategic network performance more broadly and holistically (Keast & Mandell, 2013).

Two distinct yet related concepts previously used for evaluating network performance are efficiency and effectiveness (Möller & Svahn, 2003; Möller & Rajala, 2007; Jarillo, 1988; Provan & Kenis, 2008). Although other conceptualizations of performance have been used (e.g. Ferreira et al., 2012; Turrini et al., 2010), we consider this an appropriate frame to develop an understanding of strategic network performance due to the prominence of efficiency and effectiveness in existing literature. Some research has focused on either efficiency or effectiveness (see Provan & Milward, 1995; Heikkinen et al., 2007), while others highlight that they need to be considered in combination (Jarillo, 1988; Möller & Svahn, 2003; Mouzas, 2006). In some instances improved strategic network efficiency can be interpreted as a measure of its effectiveness, however in this paper we refer to network efficiency in reference to network processes rather than outcomes (Möller et al., 2005), while acknowledging that network efficiency may indeed be the network outcome goal, thereby embedded in effectiveness. Whelan (2015) suggests the challenge in defining performance often leads to it being conflated with effectiveness despite it being a broader term. Jarillo (1988, p. 36) goes so far as to indicate that efficiency and effectiveness are “basic conditions [for the] existence of networks”.

2.1.1. Strategic network efficiency

Strategic network efficiency is aimed at reducing the transactional and/or operational costs through co-ordination of activities and resources, “in other words getting more out of the resources used” (Möller & Svahn, 2003, p. 218). This has been conceptualized as lower transaction costs (Jarillo, 1988); efficacious use of network resources (Möller & Svahn, 2003); integration of components and co-ordination of activities (Möller & Rajala, 2007); and measure of network outputs over inputs (Provan & Kenis, 2008). Increased efficiency is considered one of the main advantages of collaborating in networks over more hierarchical relationships, given it allows for greater flexibility (Whelan, 2015). While the above research outlines how network efficiency should be considered there is little empirical work evaluating which processes may influence network efficiency.

2.1.2. Strategic network effectiveness

Descriptions of strategic network effectiveness include: attainment of “positive network level outcomes” (Provan & Kenis, 2008, p. 230); achieving its desired end (Jarillo, 1988); relative measures of stakeholder outcome perceptions (Provan & Milward, 1995); and capability to generate value gains (Möller & Svahn, 2003). In acknowledging multiple approaches, there is ultimately no consensus in defining or measuring network effectiveness (Whelan, 2015). Moreover, contextual factors may also influence perceptions of effectiveness, such as the tasks/goals of network participants, stakeholders or even research frame (Raab et al., 2015). Network effectiveness needs to be better understood beyond specific contexts, while also not being equated with organizational effectiveness measures (Whelan, 2015). In recognizing multiple interpretations of effectiveness, for the purpose of understanding strategic network performance, we consider effectiveness to be attainment of network goals (Jarillo, 1988; Provan & Kenis, 2008), while also acknowledging that goals can be emergent or adaptive.

To better understand strategic network performance the relationship between efficiency and effectiveness needs elaboration. While Jarillo (1988) does not discuss whether such interaction occurs, others indicate trade-offs arise in aiming towards efficiency or effectiveness gains (e.g. Provan & Kenis, 2008; Mouzas, 2006; Möller & Svahn, 2003). Mouzas (2006) outlines that at the organizational level different

capabilities are required for managing effectiveness versus efficiency and that the resource commitment required for achieving effectiveness to some extent limits high levels of efficiency. Provan and Kenis (2008) also highlight that pursuing effectiveness can result in inefficiencies (particularly short-term) that make it difficult to achieve high levels of both. This reflects the strategic tensions between efficiency which can be achieved through greater flexibility and effectiveness that benefits from greater stability (Provan & Kenis, 2008; Turrini et al., 2010; Raab et al., 2015). In developing a better understanding of these tensions, the next section considers strategic network process categories influencing efficiency and effectiveness.

2.2. Strategic network process categories

In exploring complex issues such as performance, there is a need to holistically examine components within networks so as to uncover their interconnections and dimensions (Keast & Mandell, 2013). Furthermore, performance is not necessarily dependent on certain components but also their alignment and configuration with contextual factors (Provan & Kenis, 2008) and interdependencies (Ford & Håkansson, 2006). We therefore require an appropriate framework to analyze strategic networks in a manner that captures contextual interactions while offering insight into the processes contributing to overall performance.

Our research draws upon the extensively used ARA framework of network process categories: building actor webs; developing activity patterns and utilizing resource constellations (Håkansson & Snehota, 1995; Mattsson, Corsaro, & Ramos, 2015). In addition we include a fourth category: collective sensemaking; due to its usefulness in describing processes of establishing similar meanings towards network goals, vision and value (Medlin & Törnroos, 2014; Ford & Mouzas, 2013; Möller, 2010). By analyzing these four substance layers and the interaction between them, we are able to capture a multi-dimensional view of network processes, which facilitates a more comprehensive evaluation of strategic network performance (Ramos & Ford, 2011). In line with the research aims, this framework is suitable for understanding strategic network performance, given the relevance of efficiency and effectiveness, as well as the network level orientation.

2.2.1. Building actor webs

Building actor webs considers the development of multiple actor bonds where commitment, trust and identity construction are analyzed at the network level (Håkansson & Snehota, 1995). Establishing actor webs encourage actors' sustained commitment to contribute to collective goals (Human & Provan, 2000). Shared identity is important within strategic networks to develop mutual understanding and expectations and has been linked to network performance (Keast & Mandell, 2013; Valkokari, 2015). Trust, reciprocity and cooperative norms are also highlighted as crucial to performance as they facilitate innovation and knowledge development (Huxham & Vangen, 2005; Turrini et al., 2010; Ritala, Hurmelinna-Laukkanen, & Nätti, 2012) by enhancing network governance and internal legitimacy (Provan & Lemaire, 2012). Additionally, actor webs influence processes such as the mobilization of actors or resources, by supporting external perceptions of network legitimacy (Human & Provan, 2000; Ritala & Salmi, 2010).

While building actor webs has been discussed in terms of overall performance and sustainability, others have related this category to network effectiveness. For example, the development of stable ties was significant in the ability of mental health strategic networks to fulfill their aims (Provan & Milward, 1995). Trust facilitates network governance and internal legitimacy required to achieve strategic network effectiveness (Provan & Lemaire, 2012). In contrast, it is suggested that as strategic network problems change, the composition of actors may need to adapt to maintain effectiveness (Whelan, 2015). While conceptual research has linked a strong web of actors to network performance, there has been little research (for exceptions see

Provan & Milward, 1995) to consider this aspect in relation to improvements in either effectiveness or efficiency, a gap that this research addresses.

2.2.2. Developing activity patterns

Developing activity patterns considers how activities develop and change (Håkansson & Snehota, 1995). This relates to the notion of a value system understood as “a set of specific activities carried out by the actors constituting the net” (Möller & Rajala, 2007, p. 898). When developing value, strategic networks can create new activities (Möller & Svahn, 2003) or change old activities (Möller & Rajala, 2007). Changing activity patterns is not the sole focus, as co-ordination of activities and agenda construction are also important, contributing to stability within the network (Heikkinen et al., 2007; Möller & Rajala, 2007; Ford & Mouzas, 2008). These activities are related to the development of collective sensemaking and resource mobilization framing (Möller, 2010; Ritala & Salmi, 2010), where it is also called the activity of envisioning (Möller et al., 2005).

Discussion relating to activity patterns and strategic network performance is mainly in relation to efficiency such as “optimising the allocation of value activities between the net partners” (Möller & Svahn, 2003, p. 218) or improving operational efficiencies (Heikkinen et al., 2007). Formalized coordination mechanisms are shown to improve performance (Cristofoli, Markovic, & Meneguzzo, 2014), although similar support can be found for informal mechanisms (Gadde & Dubois, 2010). Activities involved in agenda construction, goal consensus and envisioning may indirectly contribute to performance by improving collective sensemaking, facilitating common vision and trust development. However, high levels of integration and interaction between strategic network participants may also place high demands on time and resources, thereby reducing efficiency despite accomplishing goals (Provan & Lemaire, 2012). This research contributes to the gap in recognizing how activity patterns relate to strategic network performance, through exploring their influence on strategic network efficiency and effectiveness.

2.2.3. Utilizing resource constellations

Resource constellations consider how the strategic network utilizes different resource elements to develop offerings (Håkansson & Snehota, 1995) or combine existing resources in new ways (Möller & Rajala, 2007). An important consideration is the dispersion of resources and how they complement each other to offer resource specializations. Actors must be participating in the network prior to the deployment of resources (Ritala & Salmi, 2010), therefore utilizing resource constellations is dependent on the mobilization of actors and the co-ordination of activities. Resource munificence, the overall level of resources available in a network, is considered to influence the activities that take place, although past studies have shown a mixed effect on effectiveness and overall performance (Turrini et al., 2010).

Resource specialization has been recognized as important for enhancing network efficiency (Möller & Svahn, 2003), however resource utilization is also considered to change across different strategic network types (Möller & Rajala, 2007). While resource constellations create the basis for developments to occur, they also contribute to network ‘heaviness’ which emphasizes the costs of change and reliance on utilizing available resources (Håkansson & Ford, 2002). As resource constellations have been attributed with creating inertia and stifling innovation (Håkansson & Ford, 2002), this may have implications for strategic network efficiency or effectiveness; however this relationship is unclear. Similarly, the centralization of resource flows may lead to less flexible or resilient networks, negatively impacting on overall performance (Provan & Huang, 2012). It has been suggested that adequate resources is a necessary but not necessarily sufficient condition for network effectiveness (Raab et al., 2015), however little research investigates how resource constellations contribute to strategic network performance more broadly.

2.2.4. Collective sensemaking

Collective sensemaking has a strong research focus within business networks (Mattsson et al., 2015) and is considered separate from the actor structure (Medlin & Törnroos, 2014; Welch & Wilkinson, 2002). Aspects of collective sensemaking have been considered through multiple lenses, for example, inter-cognitive shared understanding (Mouzas & Henneberg, 2015); road map influencing strategic options (Möller, 2010); cognitive network maps/pictures (Henneberg, Naudé, & Mouzas, 2010); interactive mutual sensemaking (Medlin & Törnroos, 2014); goal consensus (Provan & Kenis, 2008; Huxham & Vangen, 2005) and schema configurations (Welch & Wilkinson, 2002). Our use of collective sensemaking differs to Möller (2010) and Henneberg et al. (2010) in that we do not draw on network picture theory but rather upon the notion of a “collective mind” (Weick & Roberts, 1993).

We recognize that sensemaking processes are unique and occur at the individual level, yet it is important to consider that shared understanding and “collective mental processes” allow development of similar overlapping knowledge, allowing strategic networks to act as a group (Weick & Roberts, 1993, p. 360). Strategic network performance may be adversely affected if these processes are limited, as actors may not align with the network (Keast & Mandell, 2013). Common understandings are considered to be relative and each actor will hold different perceptions of their own and others' aims (Huxham & Vangen, 2005). Whelan (2015) refers to the related concept of network cultures within strategic networks, which can complement or conflict with network goals. This research focuses on two important interdependent processes involved in collective sensemaking: constructing network vision/goals (Möller, 2010; Mattsson et al., 2015) and internal legitimacy perceptions (Human & Provan, 2000).

Developing overlapping vision perceptions provides a stable, shared framework to inform actors' actions and their identification of boundaries (Brito & Roseira, 2005; Valkokari, 2015). Aligned vision perceptions are conducive to the emergence of latent goals, as actors will be more comfortable adapting to different goals if they remain consistent with vision perceptions (Lind, 2015). Vision differs to goals in that visioning extends network sensing by bringing together disparate actors' views towards a common trajectory (Möller & Svahn, 2003); while a network can follow multiple goals at various levels (Lind, 2015; Huxham & Vangen, 2005). In general there is only one overarching vision, though each actor may perceive it slightly differently.

Perceptions of internal legitimacy are important for long-term sustainability and require participants develop a collective understanding of benefits that they and others may receive (Human & Provan, 2000; Huxham & Vangen, 2005). Internal legitimacy is not necessarily inherent and may instead emerge over time as processes develop (Ritvala & Salmi, 2011). Mandated strategic networks for instance, can be considered to have externally established legitimacy and may therefore suffer from weak commitment or contribution from participants, if internal legitimacy is ignored or undervalued (Provan & Lemaire, 2012). Recognition of internal legitimacy justifies actors' continued membership in the strategic network (Lind, 2015). Developing internal legitimacy is linked to constructing and understanding the network's long-term vision, enabling actors to recognize and believe in possible future benefits.

The processes involved in developing the “overlap” in knowledge and understanding are resource demanding (time and effort) and involve developing redundancy. Developing a collective mind is “not concerned with efficiency” but with reliability and redundancy (Weick & Roberts, 1993, p. 357). Redundancy can involve knowledge redundancy, skill/competence redundancy and activity redundancy (Weick & Roberts, 1993) and is a critical requirement for changing activity patterns to meet a network vision. While we recognize collective sensemaking as related in a variety of ways to other network process categories (Möller, 2010; Medlin & Törnroos, 2014; Lind, 2015), there has been little previous research linking collective sensemaking to

performance. Following the highlighted literature gap, this research will investigate the influence of collective sensemaking on strategic network performance, with particular focus on efficiency and effectiveness.

3. Conceptual development

As outlined above, there is a current knowledge gap in considering how strategic network process categories influence performance (Provan & Kenis, 2008). While we recognize both efficiency and effectiveness are important when considering strategic network performance, we have limited understanding of how they interact with each other and the various network processes (Jarillo, 1988). Furthermore there has been little research investigating strategic network performance at the network level and the few papers that have focus on either efficiency or effectiveness. Therefore given the gap in the current literature, an initial conceptual framework was developed to guide our analysis.

4. Methodology

We followed a multiple qualitative case study method, a well-established approach used to investigate networks (Halinen & Törnroos, 2005; Brito, 2001; Ritvala & Salmi, 2010, 2011). It allows each network to be investigated within its unique context and incorporates dynamics, enabling an analysis of network processes over time (Dubois & Gadde, 2002; Halinen & Törnroos, 2005). In addition, it is an established theory development method (Eisenhardt, 1989; Siggelkow, 2007; Dubois & Gadde, 2002; Halinen & Törnroos, 2005; Welch, 2000). An interpretivist approach was used allowing for the presence of multiple realities, different actors' perspectives, taking account of the contexts of the phenomena under study, as well as the contextual understanding and interpretation of data (Carson, Gilmore, Perry, & Gronhaug, 2001).

Multiple case study methods improve on single case study design through offering greater explanatory power and comparability (Yin, 2009; Halinen & Törnroos, 2005). The analysis was focused at the network level, developed from specific cases in the Australian agri-business sector; Case 1 around environmental farming accreditation in eight Western Australia (WA) industries and Case 2 eliminating the use of sow stalls in the Australian pork industry. These networks meet the definition of ‘strategic networks’ in that they were intentionally created to pursue common goals; had a finite number of actors (at least three) (Möller et al., 2005) and aligned with two different strategic network types, namely, emerging business and business renewal networks (Möller & Svahn, 2003). The strategic networks investigated focused on corporate social responsibility goals (relating to the environment and animal welfare, respectively), goals necessitating a network rather than individual organization approach. For example, bringing about changes in on-farm practices requires the cooperation of numerous farmers as well as assistance from government and industry.

The networks were chosen because they allowed analysis of multiple actors' perspectives and provided rich empirical data over time illustrating how performance through efficiency and effectiveness manifest in the data over the strategic networks' life cycle. The choice of networks also allowed for comparison between a government driven (Case 1) and market/customer driven (Case 2) strategic network. Our focus was on identifying broad common patterns of strategic network processes and manifestations of performance within and across the cases.

4.1. Collecting case study evidence

Data collection included 34 in-depth interviews within the Australian agri-business sector and documents (see Appendix A). The initial interviews involved agri-business specialists to understand the sector, with snowball sampling and documentary review used to

identify further interviewees once the strategic networks were identified. Archival data, such as newspaper articles, government reports and websites, was also collected for triangulation purposes (Welch, 2000).

Interviews were semi-structured to allow for unanticipated responses to be explored further and discussed in future interviews with other participants. For example, Case 2 was first identified from interviews and was then explored further. The interviews were conducted between late 2011 and the first half of 2013 and were concluded when data saturation was achieved, where the interviews were yielding limited additional information. The average interview lasted 38 min (ranging from 20 min to 105 min).

4.2. Data analysis

In Case 1 the strategic network boundary was based on government documents and interviewees, while in Case 2 on interviewees, newspaper reports and company sustainability reports. Case data was organized into narrative descriptions and sequence analysis (Bairstow & Young, 2012; Buttriss & Wilkinson, 2006; Makkonen, Aarikka-Stenroos, & Olkkonen, 2012) to understand strategic network formation, operation and cessation. From this step a case history was developed based on critical and relevant events to improve logical coherence (Dubois & Gadde, 2002; Halinen, Törnroos, & Elo, 2013). Thereafter, interview transcripts and documentary data were coded in terms of network level processes (activity patterns, resource constellations, actor webs and sensemaking categories) and performance through network efficiency and effectiveness. Particular attention was focused on evidence of relationships between efficiency and effectiveness and network level processes; the narrative descriptions and sequence analysis over time assisted in understanding these linkages. Importantly, the analysis focused on the network level, rather than organizational level.

For example Jo's comment, "it was just a waste of money" (Jo, DAFWA), was initially coded as resource constellations through the use of resources ("money"). Then, indicating efficiency by commenting on network outputs over inputs ("waste"). Thus, suggesting that resources were not being used efficiently since the output was not commensurate with the input. Similarly, Bob's comment, "Farming for the Future fell down because it couldn't get that aggregation of effort, the marketing effort, the chain effort ... it doesn't lend itself to that collective marketing" (Bob, DAFWA), was initially coded as collective sensemaking through comments on shared understanding ("aggregation ... collective marketing"). Then, indicating effectiveness in relation to goals and goal congruency ("fell down ... couldn't get"), in other words not achieving goals.

Coding was performed independently by two researchers after which differences were discussed and coding adjusted accordingly. Data triangulation between interview data, newspaper articles and government reports allowed for a more comprehensive account of the different actor perspectives to be synthesized, highlighting important aspects such as whether there was goal congruence. A systematic combining approach (Dubois & Gadde, 2002) was employed which included the sub-processes of 'matching' theory and reality and 'direction and redirection' within the study as new insights came to light from the interviews. This approach of going 'back and forth' between research activities (data collection, data analysis and theory) allowed the researchers to develop the initial conceptual framework (Fig. 1) into the empirically informed framework for understanding the relationship between network performance and network processes (Fig. 2).

5. Case presentation and analysis

In this section brief case descriptions are presented, followed by Table 1 which provides a summary of key details of the two strategic networks. Thereafter, the cases are discussed in more detail in terms of the network level processes observed and how they relate to efficiency and effectiveness.

5.1. Case descriptions

5.1.1. Case 1: Farming for the Future Project (FFF)

Farming for the Future (FFF) is a joint WA government and industry project, initiated by the Minister of Agriculture in response to a perceived rising demand for green products (DAFWA, 2006). The strategic network operated between 2005 and 2008 and included the WA Department of Agriculture and Food (DAFWA), eight key local agricultural and horticultural industry bodies and a group of farmers participating in pilot programs. The network's stated aim was to ensure "Western Australia's food and fibre industries have the information and processes required to ensure that they can meet the growing demand to demonstrate that the food and fibre they produce is clean and safe, and is not degrading the environment" (England & White, 2009, p. 207). More specifically, the project targeted process innovation through 1) developing a list of 'current recommended practices' for sustainable agriculture for each industry; and 2) ensuring on-farm practices were in place to allow for environmental assurance (England & White, 2009). This case can be considered an emerging business strategic network as it was looking at the emerging new value system of environmental accreditation which did not currently exist and there was uncertainty over whether consumers would perceive value (Möller & Svahn, 2003). Consequently, new value activities needed to be developed and then flow through to the wider industry to achieve system-wide change towards 'green' farming.

Initially, DAFWA collaborated with industry organizations selecting farmers to participate in pilot programs that could demonstrate the implementation of on-farm practices to other farmers. This was supported by a series of networking meetings where network participants could share knowledge and experiences across industries. The majority of supporting resources for these activities were contributed by DAFWA from national and state government funding, with limited resources from industry actors. Industry funding was expected to be more forthcoming once the sustainability practices were developed on the pilot farms.

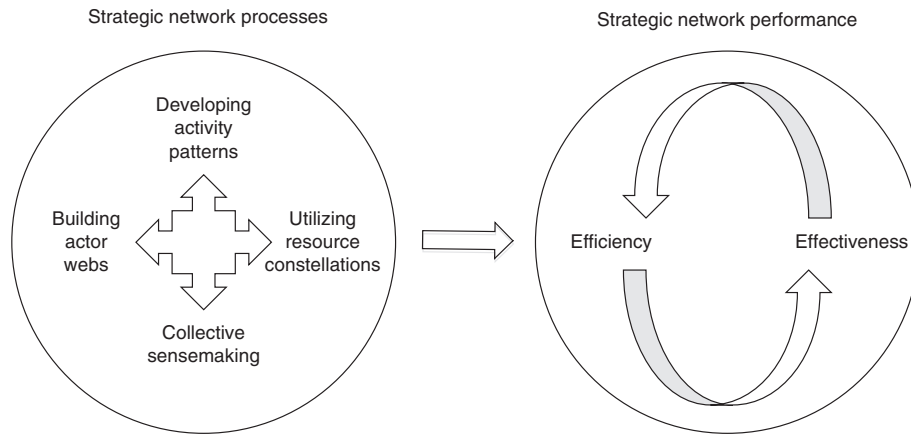
Despite these efforts, support and engagement from farmers was limited. The network was unable to obtain participation from farmers (other than the pilot group), while those in the pilot group discontinued their involvement in on-farm practices beyond the project. Critically, farm consultants were also not involved, despite their perceived influence in farming practices. The overall goal of bringing about change was not achieved and the project itself perceived by all interviewees as a failure. Anticipated market demand for accreditation corresponding to the network's goals, never eventuated. While some output was produced, namely the publication of industry specific 'current recommended practices' documents; this had little influence on farming practices and was regarded by some as an inefficient use of resources. In 2008 the project was discontinued when government funding ceased and sufficient industry funding was not forthcoming.

5.1.2. Case 2: Voluntary phase out of sow stalls in Australia – sow stall free (SSF)

The SSF initiative refers to the collaboration between retailers, agricultural producers, industry bodies and government agencies to voluntarily phase out the use of sow stalls in the Australian pork industry. Sow stalls are narrow, individual confinements to house female pigs for most of their adult lives (RSPCA, 2016). This practice had been strongly criticized by animal welfare activists and some countries had already acted to ban their use – notably the UK and EU. Rivala, Australia's largest pork supplier was an early initiator and started phasing out sow stalls in 2007, citing growing consumer awareness (The Sydney Morning Herald, 2012, p. 1). In 2009, a television program critical of sow stalls by celebrity chef Jamie Oliver, 'Jamie Saves our Bacon', aired in Australia, leading to customer complaints towards supermarkets selling sow stall pork.

The two largest Australian supermarkets, Coles and Woolworths,

Fig. 1. Initial conceptual framework.



responded directly to growing consumer sentiment by announcing moves to source fresh pork exclusively from SSF suppliers. Supermarkets agreed to contribute to some of the costs incurred by producers in implementing SSF practices. Coles were first to make this change in 2010 by placing a sow stall ban on fresh, house-brand pork, later extended to processed house-brand pork products in 2012. After this announcement, Woolworths decided to adopt a similar pork sourcing policy. These announcements represented a challenge for the pork industry, given the two supermarkets together held significant market share and transition to SSF production would be complex and costly. Government departments, such as DAFWA, provided technical resources and utilized their existing relationships to interact with key pork industry actors. The national industry body, Australia Pork Limited (APL), assisted in addressing this issue by facilitating interactions between pork producers, supermarkets and government actors, with a view to negotiating the timeframe.

Subsequently, at the APL annual general meeting in November 2010, members resolved to voluntarily phase out sow stalls by 2017 (APL, 2014). Following this resolution, Rivalea decided to implement SSF practices with immediate effect and by the end of 2013, the Australian pork industry was virtually SSF ahead of the planned deadline (Wesfarmers Ltd., 2013; Woolworths Ltd., 2013). Based on the perceptions of those involved, the network showed strong performance; not only for achieving the target of sow stall free practices, but also in the time in which necessary production and supply chain adaptations were made.

This case is classified as a business renewal strategic network as it was driven by customer demand for sow stall free pork; the international industry already had existing sow stall free technology which was instigated in the UK and Europe and the Australian industry-wide change was driven by current industry actors (Möller & Svahn, 2003). Here value was produced within pork production through the

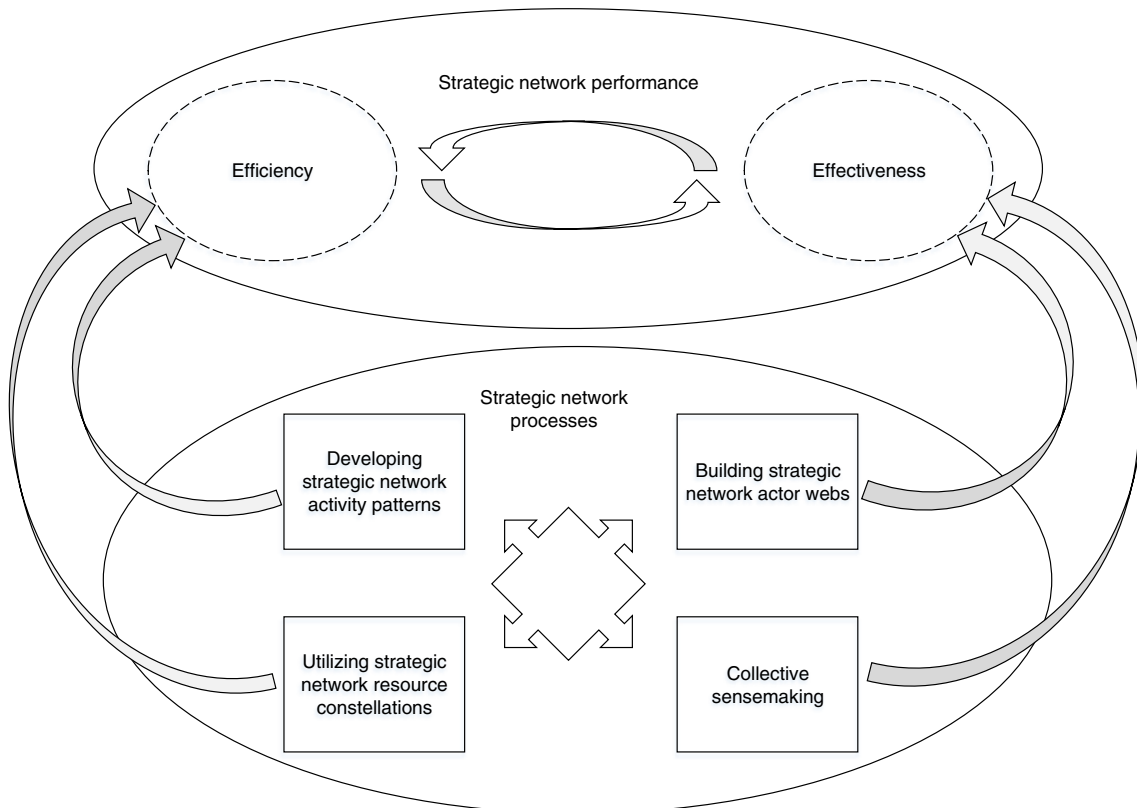


Fig. 2. Theoretical framework.

Table 1
Summary of case details.

	Case 1: farming for the Future (FFF)	Case 2: sow-stall free (SSF)
Driving forces behind strategic network	Government led initiative related to sustainability accreditation practices on farms in WA.	Market/consumer driven initiative to phase out the use of sow stalls to improve animal welfare in Australia.
Strategic Network type	Emerging business strategic network.	Business renewal strategic network.
Time period	2005–2008.	2007–2013.
Network governance	Lead organization model where the central role was played by a government department – DAFWA.	Self-governed network with a small number of key actors assuming the lead role.
Network members	<ul style="list-style-type: none"> – DAFWA – 8 industry representative organizations – Pilot farmers – WA Minister of Agriculture 	<ul style="list-style-type: none"> – Rivalea (largest pork producer in Australia) – Large supermarkets (Coles, Woolworths) – Australian pork producers – APL (industry representative organization for pork producers) – Government departments e.g. DAFWA
Notable non-members	<ul style="list-style-type: none"> – Farm consultants – Farmers (other than the pilot group) 	None
Network goal	To assist WA farmers to develop sustainable farming practices to enable environmental accreditation.	To phase out the use of sow stalls in Australia.
Goal congruence	The network goal is imposed by a government Minister and not accepted by all members. Farmers regard the on-farm practices advocated by the project as not adding value through productivity gains nor profit margins and farmers (other than the pilot group) are not mobilized.	All members' individual goals align with the network goal. The power of the larger actors (supermarkets, Rivalea) plays a role in aligning the smaller actors' goals to their own.
Strategic network outcome	Network goal is not achieved.	Network goal is achieved.
External environmental conditions	The demand for sustainability accreditation does not materialize in the Australian market which negatively affects the project. National government withdraws funding from the project in 2008.	Trends in the UK and the EU support the phasing out of sow stalls in Australia.
Resources	Financial resources are provided by government during the project. When national government funding ceases industry representative organizations choose not to continue the project through self-funding.	Members co-fund the project. Farmers receive technical assistance from government e.g. DAFWA and financial assistance from supermarkets.

incremental implementation of changing sow stall technology.

5.2. Network processes and linkage to performance

An analysis of network level processes as they relate to network performance is now presented, followed by Table 2 which summarizes the important findings.

5.2.1. Case 1: Farming for the Future Project (FFF)

5.2.1.1. Developing activity patterns. DAFWA, in conjunction with industry bodies, engaged in coordination and mobilization activities to operationalize the pilot farms. The collaboration of actors between industries enabled more efficient knowledge-sharing processes and lower costs than if the practices were pursued by each industry or farmer individually. DAFWA's coordinating role also identified industry policies and practices from external sources, thereby avoiding repetitive resource deployment. Jo (DAFWA) describes such a culture of “robbing” and “pinching” to minimize resource use from past experiences and external actors, therefore influencing network efficiency in terms of optimizing activity patterns:

“We didn't want to invent anything new [...] we had a policy that we were quite happy to rob, pinch and use anyone else's. And anyone could use our stuff.”

Once trials were operational, activities were undertaken to convince farmers (other than the pilot group) of the importance of ‘green’ practices and encourage their participation (mobilization of external actors). Yet, mobilization of the farmers (other than pilot group) did not occur with Lee (DAFWA) indicating that DAFWA and industry representative organizations did not understand farmer motivations by promoting the environmental benefits while neglecting productivity and financial benefits. Jo (DAFWA) also indicated that activities to communicate with farmers (other than the pilot group) where not attended (“hated it”) as farmers did not trust government as business advisors:

“Farmers hated it [the FFF project] ... because they don't like government telling them what practices they can do.”

5.2.1.2. Utilizing resource constellations. Resources inputted by government initially incentivized industry bodies and pilot farmers to participate in the strategic network. Once operational, resources were then used to facilitate processes to share knowledge between industries and recruit new farmers. The centralized control of government funding, through DAFWA, allowed for efficient distribution of resources, reducing participation costs and increasing efficiency. As Beth (farm consultant) highlighted, the continued reliance on one major funding source however ultimately contributed to the end of the network (“fizzle out”), as industry bodies and farmers were unwilling to contribute their own resources:

“That removal of [government] funds was when we saw everything fizzle out.”

Therefore, the continued input of financial resources from government was needed for the strategic network to survive with no other resource inputs forthcoming.

5.2.1.3. Building actor webs. DAFWA, through existing relationships with eight relevant agricultural and horticultural industry bodies and farmers, mobilized initial participation in environmental practice trials. This formed a framework of relationships to begin pursuing network goals and enabled activities around knowledge sharing and networking events for members to build trust. Subsequent attempts to recruit farmers (other than the pilot group) were unproductive, due to a lack of trust (“hated it”); thereby limiting the progress of network goals. This indicates how a (lack of) building actor web processes influences (lack of) network effectiveness by not achieving external legitimacy with farmers (other than the pilot group).

Post-project evaluations suggested that “influential” on-farm consultants were not mobilized and their absence from the network was a factor in farmers' (other than the pilot group) lack of engagement. Ruby (Dairy Australia industry organization) highlights the value of consultants to bridge relationships with farmers as they are more likely to take consultants' advice:

“We [now] use our leading farm consultants as much as possible. When we deliver a program we try to get the influential consultants to deliver it for us.”

Table 2
Summary of strategic network processes and linkage to performance.

Strategic network processes	Farming for the Future (FFF)	Sow-stall free (SSF)
Developing activity patterns	<p>Activity processes:</p> <ul style="list-style-type: none"> – Top-down goal setting for the project by the Minister of Agriculture – DAFWA co-ordinates the project – DAFWA mobilizes the 8 industry representative organizations to become members – DAFWA and industry organizations mobilize pilot farmers – DAFWA and industry organizations assist in developing pilot farms to demonstrate the benefits of the program to other farmers – DAFWA and industry organizations organize networking meetings for cross industry sharing of information – DAFWA arranges for sharing of information between industries – DAFWA and industry organization mobilization processes are not able to mobilize farmers other than the pilot group – DAFWA's attempt to feed back to the Minister to adapt the project goals is unproductive <p>Linkage to efficiency & effectiveness:</p> <ul style="list-style-type: none"> – The data suggests a direct link between network activity processes and efficiency – The data suggests a lack within network activity patterns can lead to a lack of network effectiveness via lack of collective sensemaking 	<p>Activity processes:</p> <ul style="list-style-type: none"> – Collaborative goal setting process where organizational goals converge and develop into goal consensus at the APL annual meeting – Rivalea is an early initiator – Coles and Woolworths mobilize their suppliers – Coles and Woolworths undertake co-ordination activities with suppliers – APL contact all potential industry members and share information about the strategic network goal – The limited number of pork industry actors have been involved in years of relationship-building activities – APL co-ordinates meetings of all members which enables development of goal congruence and information sharing – Government assists in sharing information about changing to SSF practices – The network goal is aligned with the external environmental conditions since the members react to consumer demands <p>Linkage to efficiency & effectiveness:</p> <ul style="list-style-type: none"> – The data suggests a direct link between network activity processes and efficiency – The data suggests network activity patterns leads indirectly to network effectiveness via collective sensemaking
Utilizing resource constellations	<p>Resource processes:</p> <ul style="list-style-type: none"> – FFF is well funded by government during the project and resources are managed and shared centrally by DAFWA – Technical resources are provided by DAFWA and industry organizations and the use of the technical resources are managed by DAFWA <p>Linkage to efficiency & effectiveness:</p> <ul style="list-style-type: none"> – The data indicates that network resource processes can lead to efficiency – The data suggests a lack of network resource constellations can indirectly influence network effectiveness via collective sensemaking 	<p>Resource processes:</p> <ul style="list-style-type: none"> – SSF is co-funded utilizing resources from supermarkets and farmers. The resources are managed by various actors e.g. supermarkets (with their suppliers) – Technical resources relating to on-farm practices are provided by farmers and government and shared via government and supermarkets <p>Linkage to efficiency & effectiveness:</p> <ul style="list-style-type: none"> – The data indicates a direct link between the above network resource processes and network efficiency – The data suggests network resource constellations can indirectly influence network effectiveness via collective sensemaking
Building actor webs	<p>Actor building processes:</p> <ul style="list-style-type: none"> – DAFWA mobilizes industry organizations – DAFWA and industry organizations mobilize pilot-farmers – DAFWA does not have trust or a strong relationship with farmers suggesting a lack of historic relationship-building processes – DAFWA's attempts to mobilize farmers by emphasising environmental benefits rather than productivity benefits are unproductive with farmers – DAFWA and industry organizations do not recognize the need to mobilize farm consultants <p>Linkage to efficiency & effectiveness:</p> <ul style="list-style-type: none"> – The data suggests the lack of network actor building processes directly influences network ineffectiveness 	<p>Actor building processes:</p> <ul style="list-style-type: none"> – Rivalea and Coles are early initiators of the network and their position adds external legitimacy – Coles and Woolworths rely on historic relationship building processes with suppliers in mobilizing and coordinating them – APL play a centralized coordinating role and bring together all pork industry members at the annual general meeting to reach consensus – The network recognises that they do not have the buying power to mobilize suppliers in the US and so limit the network goal accordingly to Australia <p>Linkage to efficiency & effectiveness:</p> <ul style="list-style-type: none"> – The data suggests that network actor building processes can influence network effectiveness
Collective sensemaking	<p>Collective sensemaking processes:</p> <ul style="list-style-type: none"> – The feedback processes in the network do not enable the network members to recognize the need to mobilize farm consultants to gain the support of farmers – The goal setting process is not inclusive and involves only the Minister – The network members are not able to develop goal congruence within DAFWA – The network does not respond to feedback that the network goal is not aligned to changing external conditions and farmer sentiment <p>Linkage to efficiency & effectiveness:</p> <ul style="list-style-type: none"> – The data indicates the lack of network collective sensemaking processes can lead to network ineffectiveness 	<p>Collective sensemaking processes:</p> <ul style="list-style-type: none"> – The communication processes of APL enable all key actors to be mobilized – The APL meeting enables a participatory goal setting process involving key industry members – The network processes, such as communication between the supermarkets and their suppliers and between the members through coordination of APL, lead to goal alignment – The network aligns its goal to external environmental conditions by responding to consumers and world trends <p>Linkage to efficiency & effectiveness:</p> <ul style="list-style-type: none"> – The data indicates network collective sensemaking processes can influence network effectiveness

Ruby's comment above indicates that farm consultants are perceived as “influential” while the industry organizations and government are not (“don't like government telling them”). Also, her comment highlights the network's inability to advance goals of increasing engagement in environment practices without consultants as the industry organization lacked enough trust to interact directly with farmers, thereby contributing to the network's lack of external legitimacy and inability to sustain support for FFF goals. Consequently, insufficient participant categories in actor webs were considered to directly influence the ability to achieve goals (i.e. effectiveness). Therefore, the inability to mobilize a critical actor group (consultants) may have negatively influenced the ability of the strategic network to achieve goals and therefore strategic network effectiveness.

5.2.1.4. Collective sensemaking. Beth (former DAFWA) describes the lack of goal congruence initially as the strategic network goal was established by the Minister without input from key stakeholders, thus being a top-down goal:

“the Department of Ag [DAFWA] was kind of told by the Ministry you have to do this this because you know this is what I [the Minister] want to do.”

Although this goal was developed due to the rising demand for environmental products it was considered inconsistent with farmers' concerns about financial and productivity benefits. There was also mixed internal support within DAFWA, indicating that project internal legitimacy concerns might emerge and consequently a lack of collective sensemaking, thereby contributing to goals not being achieved i.e. to a lack of network effectiveness.

Lee (DAFWA) described how actors engaged for their own purposes (“never really joined together”), primarily to make use of the resources provided by government leading to fragmentation (lack of “link”), “disconnect” and lack of understanding between different parties affected DAFWA's abilities to engage farmers:

“There was a disconnect [...] so they [DAFWA] never really joined together to demonstrate to farmers that link between some of the practices that were trying to be recommended [...] people making the recommendation from the environmental sort of groups [within DAFWA] had been trained in environmental management [but] they didn't understand the full dairy production system.”

Therefore, a fragmented DAFWA, due to the lack of communication between the environmental management group and commercial group (which understood the farmers' business and what was commercially viable for farmers), resulted in DAFWA's communication not resonating with farmers. Consequently, farmers (other than the pilot group) did not participate leading to the lack of effectiveness in achieving the overall goal. Yet, this problem was further exacerbated as network goals were not adapted in light of market conditions and farmer perceptions of environmental accreditation. Jo (DAFWA) noted the absence of on-going evaluation or feedback mechanisms, as well as the Minister's unresponsiveness to adopt alternative approaches. As Bob (DAFWA) described the strategic network lacked a common understanding (“aggregation of effort”) between participants, ultimately influencing the ability to achieve network goals (“fell down”):

“FFF fell down because it couldn't get that aggregation of effort, that marketing effort, that chain effort [...] it doesn't lend itself to that collective marketing.”

5.2.2. Case 2: Voluntary phase out of sow stalls in Australia – sow stall free (SSF)

5.2.2.1. Developing activity patterns. Developing SSF practices involved Coles and Woolworths undertaking co-ordination activities with suppliers, initially to encourage their co-operation and then to monitor progress. These co-ordination activities benefited from the small number of key actors in the Australian pork industry thus facilitating cost reductions and increasing the speed of conversion to SSF practices. This contributed to network efficiency as described by

Beth (DAFWA) who indicated that government agencies were well-connected (“17 phone calls”) and could easily access relevant industry managers:

“At the national level, I can make 17 phone calls and I've got 80% of my pork supply covered.”

5.2.2.2. Utilizing resource constellations. A major challenge to implementing SSF objectives was the large resource costs and loss of farm productivity involved in updating on-farm practices and supply chain processes. Although Rivalea had begun to invest in SSF technologies, most pork producers were reliant on sow stalls and unprepared to make SSF changes. Coles and Woolworths subsidized some of the additional costs and government departments such as DAFWA provided technical resources to assist farmers. However, resources were not considered too much of a problem with Beth (farm consultant) indicating they could absorb additional costs (“have got profit”) by taking a collective approach (“whole of industry”) to SSF objectives:

“They [Australian pork industry] have got profit. They are able to employ good animal welfare practices, good environmental practices [...] all that sort of stuff that they need to do as a whole of industry.”

The sharing of the resources in pursuing SSF objectives led to greater network efficiency in relation to time (since sow stall free practices were implemented four years ahead of schedule), but were not necessarily financially optimal since Coles, Woolworths and DAFWA invested extra resources to facilitate the accelerated process.

5.2.2.3. Building actor webs. Early participation of key industry members, Rivalea and Coles, added considerable external legitimacy to the developing network, contributing to eventual nationwide participation. The network utilized a small number of close existing actor relationships (“17 phone calls”) to mobilize producers around SSF goals. As both Coles and Woolworths publically announced moves to SSF pork supply, the pork industry was strongly influenced to participate or risk losing significant access to consumers. Moreover, given the demand for local, fresh SSF pork, the supermarkets had a better opportunity to influence the small number of Australian suppliers than larger foreign suppliers for whom Australia represented relatively insignificant demand. This dynamic was explained by Sven (pork producer) in suggesting Australian buyers could do little to influence practices in North America:

“Most of our frozen pig meat will come from North America. If you look at the size of the Australian market [compared] to the North American market, where they have got 360 million and we've got 20 million, we are very, very small players. So we probably wouldn't be able to drive the behaviors of those people anyway.”

The above quote highlights that the network was able to identify and target the possible and necessary strategic network members to achieve its goal (i.e. Australian pork industry actors) and recognized that it did not have the power to mobilize foreign pork suppliers in markets such as the US to join the network.

Importantly the centralized coordinating role performed by APL during the 2010 meeting with all producers, allowed for consensus to be reached and plans to be arranged to achieve SSF objectives. As all major actors were involved in the SSF network, ensuring an extensive actor web, knowledge was available in relation to necessary production, consumer and regulatory issues, leading to support for prompt and direct action and achieving network goals (i.e. network effectiveness), illustrating the direct link between processes relating to building actor webs and network effectiveness.

5.2.2.4. Collective sensemaking. The SSF case illustrated the process of goal congruence among participating actors. Early initiators, Rivalea and Coles, engaged in sensemaking in their recognition of changing consumer demand, from which they developed SSF goals. At this point SSF goals were limited to individual actors, however these soon

developed into a collective industry goal as other actors became involved. The involvement of Woolworths in particular, represented a pivotal factor in the industry-wide shift towards SSF, signaling that the majority of Australian supermarket demand would soon be for SSF pork. The common objectives of the two main supermarkets related to their ongoing competitive rivalry (“marketing edge”), which sought to capitalize on consumer trends and keep pace with each other:

“I think the thing with Coles, their main aim will be to differentiate from Woolworths [...] we all do the same; we follow the trends that are going to be beneficial. They [Coles and Woolworths] have to think that will give them the marketing edge.” (Derek, DAFWA)

On the supplier side, collective sensemaking processes occurred within supermarket supply chains, while also at an industry level through producer engagement undertaken by APL. The resolution at the APL 2010 meeting indicates eventual goal consensus, targeting the complete phasing out of sow stall use in the industry nationwide. This provided a tangible roadmap and timeframe, which assisted in keeping individual members of the network on track towards the overall collective goal. It also brought producers in line with supermarkets’ sow stall agenda, ensuring Australian pork production would remain stable. Once SSF objectives achieved internal legitimacy, Bill (DAFWA) describes how smaller producers moved quickly to introduce SSF practices following Rivalea’s lead in implementing SSF practices and the APL resolution influenced by the power of the supermarkets around end consumer sales:

“The industry had no option but to follow.”

5.3. Linking between strategic network efficiency and effectiveness

The SSF case offered insight into a possible trade-off that can arise between strategic network efficiency and effectiveness. This was highlighted where SSF achieved their goal four years ahead of the timeline agreed at the APL meeting (network effectiveness). Yet this arose at the cost of extra network resources (financial, technical and co-ordination) to expedite moves to sow stall free practices (diminished cost efficiency than if stalls had been phased out gradually). The FFF case did not offer further insight into the possible trade-offs since the data did not illustrate effectiveness.

5.4. Feedback loops between performance perceptions and network processes

As mentioned, DAFWA and industry bodies recognized about a year into the project that farmers “hated” FFF and that the project was thus not achieving its main goal (lack of effectiveness). This led to collective sensemaking and feedback activities to try to get the Minister to adapt the project goal; which were unsuccessful, hence network activities and goals remained unchanged. This inability to redirect the project through collective sensemaking activities contributed to the eventual downfall of the network. This illustrates the feedback loop from network processes to performance (effectiveness) back to processes (collective sensemaking) and again to performance (effectiveness).

6. Discussion

This research considers how strategic network processes influence its performance, making two main contributions. The first contribution provides an empirically informed conceptual framework for understanding strategic network efficiency and effectiveness at the network level, not previously provided. The second contribution focuses on how strategic network efficiency and effectiveness interact within strategic network performance. The theoretical framework, Fig. 2, illustrates these contributions through the curved arrows from specified processes to efficiency and effectiveness aspects. Although there is empirical support for the interaction between the four categories of network processes (reflected by the interaction icon) they were not the focus of this research.

6.1. Strategic network processes and their influence on efficiency and effectiveness

Further to our empirical data we refine our conceptual model to indicate how strategic network processes are likely to influence strategic network efficiency and effectiveness, as illustrated in Fig. 2. In particular, building actor webs and developing collective sensemaking were perceived to directly influence strategic network effectiveness, while developing activity patterns and utilizing resource constellations were perceived to directly influence strategic network efficiency.

Strategic network effectiveness is aligned to achieving outcomes, goals and value gains (Provan & Kenis, 2008; Möller & Svahn, 2003). The SSF case achieved an overall goal of Australia sow stall free forming practices before its agreed timeframe. This goal was achieved through developing collective sensemaking (industry agreement of goal at 2010 APL meeting) and building actor webs (APL ensuring all players involved). Interestingly, the FFF case did not achieve its goals of the industry implementing ‘green’ practices (England & White, 2009) due to the lack of uptake in the environmental practices by farmers outside the pilot groups as the strategic network lacked external legitimacy and therefore was unable to mobilize this group of farmers to join the strategic network.

The direct relationships between developing actor webs and collective sensemaking to network effectiveness supports the notion that legitimacy and visioning/goal activities play an important role in achieving performance, yet are not necessarily efficient processes due to the redundancy and overlapping of knowledge structures required (Weick & Roberts, 1993; Lind, 2015; Valkokari, 2015; Provan & Kenis, 2008; Human & Provan, 2000). FFF lacked credibility and persuasiveness in network goals resulting in the inability to mobilize actors (Möller, 2010). Consequently, critical actors were not included, impacting actor webs through their failure in identifying optimal member inclusion. Achieving optimal member inclusion is critical for ensuring that actor mobilization has access to the “skill set” and trust needed to achieve network goals (Brito & Roseira, 2005; Valkokari, 2015). While trust development is an important component for achieving network effectiveness, it does decrease network efficiency through the reduction in flexibility and lower cost targets through an inability to change existing activity patterns and resource constellations (Provan & Kenis, 2008; Provan & Milward, 1995). The SSF case highlights this as achieving effectiveness required the inputs of resources from the supermarkets, thus not resulting in lower costs (but lower than if all actors were doing it alone).

A difference between the two cases is that SSF was market and consumer driven through large corporate strategic network members and FFF is a government led initiative. Farmers in the FFF case did not trust “government telling them what to do” and consequently the project did not have legitimacy perceptions of the farmers who preferred information from consultants. In the SSF case the initial large corporate actors (Rivalea and Coles) had existing legitimacy perceptions from within the industry that they could use to facilitate collective sensemaking and could mobilize other pork producers. Thus, existing legitimacy perceptions may play an important role in collective sensemaking to influence strategic network effectiveness similar to previous research (e.g. Provan & Lemaire, 2012; Provan & Kenis, 2008).

Previous research on network effectiveness (e.g. Turrini et al., 2010; Provan & Kenis, 2008) focused on government led initiatives in the provision of health services which did not involve members in direct competition in the marketplace. In the SSF case, in particular, competition emerged as influencing collective sensemaking with Coles and Woolworths aiming to achieve a marketing edge in the consumer driven environment. Thus, the two powerful supermarkets reinforced the goal as they both competed to provide sow stall free pork products for consumers indicating that competition may play a role in facilitating strategic network performance through improving the effectiveness of achieving goals.

Our results support previous research that aligns network efficiency with the costs and use of resources operating within strategic networks (Möller & Svahn, 2003; Heikkinen et al., 2007). For example, in the FFF network, network efficiency was gained through “robbing” and “pinching” to quickly develop environmental protocols (activity patterns) and funding through grants (resource constellations). Within the SSF network, efficiency was developed through coordination of the APL and was facilitated by lower requirements in communication processes (activity patterns) and supermarket participants assisting pork producers with additional costs involved in achieving sow stall free practices (increasing resource constellations). Within our cases, network co-ordination activities and the resource assistance to integrate network process changes strongly influenced network efficiency perceptions, similar to Ritvala and Salmi (2010) where resource deployment was an important component of actor mobilization and activity co-ordination.

While our results did not indicate direct relationships from developing actor webs/collective sensemaking to network efficiency or developing activity patterns/utilizing resource constellations to network effectiveness, indirect links emerged from the data through the interdependencies embedded within network process categories. For example, in the FFF case developing actor webs with farm consultants is considered important for not only effectiveness (“influential” in achieving collective sensemaking), but also efficiency, as consultants working with multiple farmers meant Dairy Australia only needed to interact with a small number of intermediaries (consultants). Similar indirect links emerged from developing activity patterns/resource ties through actor webs/collective sensemaking to improve network effectiveness. For example, DAFWA representatives highlighted how resource constellations and activity patterns (“aggregation of effort”) lead to a lack of collective sensemaking (“collective marketing”) that resulted in a perceived lack of effectiveness (“fell down”).

The cases also illustrated feedback loops from processes to performance and back to processes and so forth. The members' perceptions of performance during the life-cycle were found to influence collective sensemaking processes. However in FFF the network's collective sensemaking processes were not able to bring about changes in goals and concomitant changes in network activities, which in turn influenced network effectiveness.

6.2. Relationship between strategic network effectiveness and efficiency

Our second contribution considers the relationship between strategic network effectiveness and efficiency, differing from previous literature focusing on a single dimension (see Provan & Milward, 1995; Heikkinen et al., 2007). FFF achieved aspects of network efficiency while funding (resource constellations) was forthcoming but once funding was withdrawn the network ceased. Whether the network ceased due to not achieving their goals (i.e. network effectiveness) or the funding issue (i.e. partial network efficiency) is difficult to determine. The FFF network most likely “fizzled out” due to a combination of not achieving network effectiveness and only partially achieving network efficiency.

Therefore, in relation to the influence of network efficiency and effectiveness on overall performance our cases highlight that: (1) achieving both strategic network efficiency and effectiveness positively influences perceptions of overall strategic network performance; and (2) achieving network efficiency without achieving network effectiveness may result in negative overall strategic network performance perceptions. The above points highlight that even though a network might be “efficient” to some extent, if it is not effective then it is unlikely to be perceived as performing well. This indicates that network effectiveness is extremely important in influencing overall network performance while network efficiency may have less influence on network performance. These results bring into question Jarillo's (1988) suggestion that both efficiency and effectiveness are a basic condition for networks. Our cases indicate that achieving effectiveness is likely to

be an essential condition, yet efficiency in itself is not sufficient for performance to be considered positive by all participants. Heikkinen et al. (2007) indicate that network management should focus on improving operational efficiency, whereas we argue that this focus should mainly be considered in contexts where efficiency gains are embedded in strategic network goals, such that they are also a component of effectiveness and therefore more strategic.

Others highlight that different network types may have different perceptions of what is meant by performance (Möller & Svahn, 2003) raising the question around the influence of strategic network type on efficiency and effectiveness. It could be argued that the FFF case needed to focus more on visioning and mobilization of consultants to improve legitimacy perceptions and consequently, effectiveness. Thus, our results could support the importance of effectiveness within emerging strategic network types, similar to Möller and Svahn (2003). While in the SSF case, an example of a business renewal strategic network type, visioning and mobilization were developed through the industry body (effectiveness) and achieved within a specified time limit (efficiency); thus indicating the importance of both efficiency and effectiveness for this strategic network category, similar to Möller and Svahn (2003).

Moreover, our results indicate a time efficiency requirement was embedded within the network goal (achieving sow stall free by 2017), thus indicating that efficiency is not necessarily independent of effectiveness, particularly when efficiency metrics are explicitly stated. This is displayed in Fig. 2 with the link between strategic network effectiveness and efficiency. Although it can be argued that focusing on network effectiveness (achieving network goals) is critical in some cases, it may also result in a focus on network efficiency, depending on what the goal entails.

6.3. Managerial and policy implications

Hub actor managers in strategic networks can use the framework, outlined in Fig. 2, to: understand network performance; and prioritize which practices can improve performance. In particular, our results highlight that managers need to achieve network effectiveness through building actor webs containing participants with necessary capabilities for achieving network goals and establishing collective interests to improve collective sensemaking. Building actor webs will require participants to evaluate how each participant's contribution aligns with network goals/vision and determine possible gaps in requirements for further actor mobilization. This may result in actors continually leaving and joining the network as value requirements change over time. The dynamics of such changes also need to be monitored however, as trust development is also critical in building strong actor webs and will influence collective sensemaking processes, therefore requiring continuity of interaction between participants.

Given that one of the cases was initiated by a government organization there are implications for policy. Firstly, government departments need to develop processes to enhance collective sensemaking across the different participants such that a consistent and aligned vision is portrayed within the actor web, particularly in the case where they are often the hub actor whose role it is to bring other actors on board. Within the FFF case, government officials were not aligned across the network vision resulting in a lack of network effectiveness, even though network goals were developed in the early stages of network development. Another implication for policy is that government needs to better understand farmer decision-making processes and the importance of including different actor types, i.e. consultants. Including consultants within the process could have not only improved network effectiveness through improved alignment across network goals, but also improved network efficiency through consultants working with multiple farmers during the implementation of new environmental practices.

7. Conclusion, future research and limitations

This research responds to Möller and Svahn's (2003, p. 227) challenge of “assessing the effectiveness or performance of different network types” through “theory driven multi-case design”. While this paper only focuses on two ideal types, it contributes to the current literature by delving into the processes that may influence efficiency and effectiveness, within an empirical context of agri-business strategic networks. While it is recognized that strategic networks are individualistic, due to the context specific nature of their operations and the different goals/vision that they develop, we build on previously established network approaches to develop a simplified theoretical framework that can be considered for assessing how strategic network processes may influence performance through efficiency and effectiveness. We then highlight how this framework can be applied to two different strategic network types: business renewal networks and emerging business networks.

Consequently, this paper provides insights into how network performance, considered via effectiveness and efficiency, is influenced by

network processes. Results indicate that achieving network effectiveness is critical for its performance, and consequently, needs to be a managerial priority. While network efficiency boosts overall performance, it is not as critical in regards to sustaining network operations. It is noted that there is a link between efficiency and effectiveness and that one will impact the other. In one of our cases, aiming for effectiveness did result in a partial lowering of efficiency through the required input of more resources. Yet, the case also had a time requirement goal embedded making the focus on effectiveness also improve efficiency in relation to time of goal achieved.

Consequently, future research could investigate further how efficiency and effectiveness impact each other, particularly whether there is a continuous trade-off between them and/or how efficiency aspects may be embedded in the effectiveness goals. This research did not include a demand-supply strategic network type and future research could consider whether the theoretical framework developed would also apply. Even though two cases were used, one of the main limitations is that the results may not be generalizable to other strategic networks, particularly those outside agri-business industries.

Appendix A. Interviewees in the agri-business network

Interviewees related to both cases				
#	Pseudonym used	Organization	Interviewee position	Interview type
Government departments				
1	Bill	DAFWA (Pork Innovation Group)	Development Officer	Face-to-face
2	Derek	DAFWA (Pork Innovation Group)	Director	Face-to-face
3	Beth	Farm consultant, formerly with DAFWA	Officer then consultant	Face-to-face
Industry organizations				
4		Western Australia Farmers' Federation (WAFF)	Director of policy	Face-to-face
5		Farm consultant/Australian Association of Agricultural Consultants (WA) Inc. (AAAC)	Management consultant	Face-to-face
6		Western Australia Pork Producers Association (WAPPA)	Executive officer	Face-to-face
Industry				
7		Largest integrated agrigroup in WA	General manager of division and Executive Board member of Australia Pork Ltd.	Face-to-face
8		Large WA agrigroup.	Executive Director	Face-to-face
9	Sven	Food processor	General manager of division.	Face-to-face
10		Small butcher	Owner and manager	Face-to-face
11		Small butcher	Butcher	Face-to-face
12		Large independent supermarket	Owner manager	Face-to-face
13		Food service, seafood distributors, ship suppliers	Chief executive officer	Face-to-face
14		Food service and distribution	General manager of division (2 interviews)	Face-to-face
15		Food service and distribution	Special Projects coordinator	Face-to-face
Consultants and other				
16		Logistic provider, recycling	Director	Face-to-face
17		University and DAFWA	Lecturer, worked on 'Farming for the Future' initiative	Face-to-face
18		Green specialist	Consultant	Face-to-face
Interviewees related to FFF case only				
#	Pseudonym used	Organization	Interviewee position	Interview type
Government departments				
19	Jo	WA Department of Agriculture and Food (DAFWA); state government	Director	Face-to-face
20	Bob	DAFWA; state government	Director	Face-to-face
21		DAFWA (organics); state government	Development officer	Face-to-face
22		DAFWA (food market development); state government	Manager	Telephone

23	DAFWA; state government	Leader	Telephone
24	Lee	DAFWA (dairy section)	Manager
25	Department of Environment and Conservation (DEC) (later Department of Environment Regulation (DER)); state government	Director	Face-to-face
26	DEC (later DER)	Manager, Strategic Policy and Programmes	Face-to-face
Industry organizations			
27	Ruby	Dairy Australia; National industry organization	Manager
28	Western Dairy; State industry organization	Officer	Telephone
29	Western Australia Local Government Association (WALGA); Association representing local government councils	Deputy Chief Executive Officer	Face-to-face
30	WALGA	Executive manager - environment and waste	Face-to-face
Industry			
31	Organic vegetable farmer and retailer	Owner	Face-to-face
32	Small dairy farmer and processor	Owner, managing director	Presentation and telephone interview
33	Large dairy processor	Services Supervisor	Face-to-face
34	Large dairy processor	Former operations manager.	Face-to-face

References

- Alajoutsijärvi, K., Möller, K., & Rosenbröijer, C.-J. (1999). Relevance of focal nets in understanding the dynamics of business relationships. *Journal of Business-to-Business Marketing*, 6(3), 3–35.
- APL (2014). Australian pork industry overview fact sheet. Retrieved from http://australianpork.com.au/wp-content/uploads/2013/09/FINAL-8CPP_Z_AustralianPork_Inner13_LR.pdf.
- Bairstow, N., & Young, L. (2012). How channels evolve: A historical explanation. *Industrial Marketing Management*, 41(3), 385–393.
- Brito, C., & Roseira, C. (2005). A model for understanding supply chain networks. *Journal on Chain and Network Science*, 5(2), 55–63.
- Brito, C. M. (2001). Towards an institutional theory of the dynamics of industrial networks. *The Journal of Business & Industrial Marketing*, 16(3), 150–166.
- Buttriss, G. J., & Wilkinson, I. F. (2006). Using narrative sequence methods to advance international entrepreneurship theory. *Journal of International Entrepreneurship*, 4(4), 157–174.
- Carson, D., Gilmore, A., Perry, C., & Gronhaug, K. (2001). *Qualitative marketing research*. London, England: SAGE Publications Ltd.
- Corsaro, D., Ramos, C., Henneberg, S. C., & Naudé, P. (2012). The impact of network configurations on value constellations in business markets—The case of an innovation network. *Industrial Marketing Management*, 41(1), 54–67.
- Cristofoli, D., Markovic, J., & Meneguzzo, M. (2014). Governance, management and performance in public networks: How to be successful in shared-governance networks. *Journal of Management and Governance*, 18(1), 77–93.
- DAFWA (2006). *Farming for the future, self-assessment tool*. WA: Demonstrating Sustainability.
- Dubois, A., & Gadde, L.-E. (2002). Systematic combining: An abductive approach to case research. *Journal of Business Research*, 55(7), 553–560.
- Eisenhardt, K. M. (1989). Building theories from case study research. *The Academy of Management Review*, 14(4), 532–550.
- England, D., & White, M. (2009). Industry development: Involving the whole industry in practice change. *Extension Farming Systems Journal*, 5(1), 207–212.
- Ferreira, P., Shamsuzzoha, A., Toscano, C., & Cunha, P. (2012). Framework for performance measurement and management in a collaborative business environment. *International Journal of Productivity and Performance Management*, 61(6), 672–690.
- Ford, D., & Håkansson, H. (2006). The idea of business interaction. *The IMP Journal*, 1(1), 4–20.
- Ford, D., & Mouzas, S. (2008). Is there any hope? The idea of strategy in business networks. *Australasian Marketing Journal; AMJ*, 16(1), 64–78.
- Ford, D., & Mouzas, S. (2013). Service and value in the interactive business landscape. *Industrial Marketing Management*, 42(1), 9–17.
- Gadde, L.-E., & Dubois, A. (2010). Partnering in the construction industry—Problems and opportunities. *Journal of Purchasing and Supply Management*, 16(4), 254–263.
- Gulati, R., Nohria, N., & Zaheer, A. (2000). Strategic networks. *Strategic Management Journal*, 21(3), 203–215.
- Håkansson, H., & Ford, D. (2002). How should companies interact in business networks? *Journal of Business Research*, 55(2), 133–139.
- Håkansson, H., & Snehota, I. (Eds.). (1995). *Developing relationships in business networks*. London and New York: Routledge.
- Halinen, A., & Törnroos, J.-A. (2005). Using case methods in the study of contemporary business networks. *Journal of Business Research*, 58(9), 1285–1297.
- Halinen, A., Törnroos, J.-Å., & Elo, M. (2013). Network process analysis: An event-based approach to study business network dynamics. *Industrial Marketing Management*, 42(8), 1213–1222.
- Heikkinen, H., Mainela, T., Still, J., & Tahtinen, J. (2007). Roles for managing in mobile service development nets. *Industrial Marketing Management*, 36, 909–925.
- Henneberg, S. C., Naudé, P., & Mouzas, S. (2010). Sense-making and management in business networks — Some observations, considerations, and a research agenda. *Industrial Marketing Management*, 39(3), 355–360.
- Human, S. E., & Provan, K. G. (2000). Legitimacy building in the evolution of small-firm multilateral networks: A comparative study of success and demise. *Administrative Science Quarterly*, 45(2), 327–365.
- Huxham, C., & Vangen, S. (2005). *Managing to collaborate: The theory and practice of collaborative advantage*. Routledge.
- Jarillo, J. C. (1988). On strategic networks. *Strategic Management Journal*, 9, 31–41.
- Keast, R., & Mandell, M. P. (2013). Network performance: A complex interplay of form and action. *International Review of Public Administration*, 18(2), 27–46.
- Lind, F. (2015). Goal diversity and resource development in an inter-organisational project. *Journal of Business & Industrial Marketing*, 30(3/4), 259–268.
- Majava, J., Isoherranen, V., & Kess, P. (2013). Business collaboration concepts and implications for companies. *International Journal of Synergy and Research*, 2(1), 23–40.
- Makkonen, H., Aarikka-Stenroos, L., & Olkkonen, R. (2012). Narrative approach in business network process research—Implications for theory and methodology. *Industrial Marketing Management*, 41(2), 287–299.
- Mattsson, L. G., Corsaro, D., & Ramos, C. (2015). Sense-making in business markets - The interplay between cognition, action and outcomes. *Industrial Marketing Management*, 48, 4–11.
- Medlin, C. J., & Törnroos, J.-Å. (2014). Interest, sensemaking and adaptive processes in emerging business networks—An Australian biofuel case. *Industrial Marketing Management*, 43(6), 1096–1107.
- Möller, K. (2010). Sense-making and agenda construction in emerging business networks - How to direct radical innovation. *Industrial Marketing Management*, 39(3), 361–371.
- Möller, K., & Rajala, A. (2007). Rise of strategic nets - New modes of value creation. *Industrial Marketing Management*, 36, 895–908.
- Möller, K., Rajala, A., & Svahn, S. (2005). Strategic business nets—their type and management. *Journal of Business Research*, 58(9), 1274–1284.
- Möller, K., & Svahn, S. (2003). Managing strategic nets: A capability perspective. *Marketing Theory*, 3(2), 209–234.
- Mouzas, S. (2006). Efficiency versus effectiveness in business networks. *Journal of Business Research*, 59, 1124–1132.
- Mouzas, S., & Henneberg, S. C. (2015). Inter-cognitive representations in business networks. *Industrial Marketing Management*, 48, 61–67.
- Munksgaard, K. B., & Medlin, C. (2014). Self-and collective-interests: Using formal network activities for developing firms' business'. *Industrial Marketing Management*, 43(4), 613–621.
- Provan, K., & Kenis, P. (2008). Modes of network governance: Structure, management, and effectiveness. *Journal of Public Administration Research and Theory*, 18(2), 229–252.
- Provan, K. G., & Huang, K. (2012). Resource tangibility and the evolution of a publicly funded health and human services network. *Public Administration Review*, 72(3), 366–375.
- Provan, K. G., & Lemaire, R. H. (2012). Core concepts and key ideas for understanding public sector organizational networks: Using research to inform scholarship and practice. *Public Administration Review*, 72(5), 638–648.
- Provan, K. G., & Milward, H. B. (1995). A preliminary theory of interorganizational network effectiveness: A comparative study of four community mental health

- systems. *Administrative Science Quarterly*, 40(1), 1–33.
- Raab, J., Mannak, R. S., & Cambré, B. (2015). Combining structure, governance, and context: A configurational approach to network effectiveness. *Journal of Public Administration Research and Theory*, 25(2), 479–511.
- Ramos, C., & Ford, I. D. (2011). Network pictures as a research device: Developing a tool to capture actors' perceptions in organizational networks. *Industrial Marketing Management*, 40(3), 447–464.
- Rampersad, G., Quester, P., & Troshani, I. (2010). Managing innovation networks: Exploratory evidence from ICT, biotechnology and nanotechnology networks. *Industrial Marketing Management*, 39(5), 793–805.
- Ritala, P., Hurmelinna-Laukkanen, P., & Nätti, S. (2012). Coordination in innovation-generating business networks – The case of Finnish Mobile TV development. *Journal of Business & Industrial Marketing*, 27(4), 324–334.
- Ritvala, T., & Salmi, A. (2010). Value-based network mobilization: A case study of modern environmental networkers. *Industrial Marketing Management*, 39(6), 898–907.
- Ritvala, T., & Salmi, A. (2011). Network mobilizers and target firms: The case of saving the Baltic Sea. *Industrial Marketing Management*, 40(6), 887–898.
- RSPCA (2016). What is the difference between free range, bred free range, organic, sow-stall free? Retrieved from http://kb.rspca.org.au/What-is-the-difference-between-free-range-bred-free-range-organic-sow-stall-free_92.html.
- Siggelkow, N. (2007). Persuasion with case studies. *Academy of Management Journal*, 50(1), 20–24.
- The Sydney Morning Herald (2012). More piglets 'born free' as producers voluntarily phase out sow stalls. Retrieved from http://www.smh.com.au/environment/animals/more-piglets-born-free-as-producers-voluntarily-phase-out-sow-stalls-20120415-1x1n8.html?gclid=CLSnmez3LwCFVIAvAod_yUA4g.
- Turrini, A., Cristofoli, D., Frosini, F., & Nasi, G. (2010). Networking literature about determinants of network effectiveness. *Public Administration*, 88(2), 528–550.
- Valkokari, K. (2015). Describing network dynamics in three different business nets. *Scandinavian Journal of Management*, 31(2), 219–231.
- Weick, K. E., & Roberts, K. H. (1993). Collective mind in organizations: Heedful inter-relating on flight decks. *Administrative Science Quarterly*, 38(3), 357–381.
- Welch, C. (2000). The archaeology of business networks: The use of archival records in case study research. *Journal of Strategic Marketing*, 8(2), 197–208.
- Welch, C., & Wilkinson, I. (2002). Idea logics and network theory in business marketing. *Journal of Business-to-Business Marketing*, 9(3), 27–48.
- Wesfarmers Ltd (2013). *Wesfarmers Sustainability Report*, 2013.
- Whelan, C. (2015). Managing dynamic public sector networks: effectiveness, performance, and a methodological framework in the field of national security. *International Public Management Journal*, 18(4), 536–567.
- Woolworths Ltd (2013). *Woolworths Ltd Corporate Responsibility Report*, 2013.
- Yin, R. K. (2009). *Case Study Research. Design and Methods* (4th ed.). 5. Los Angeles, London, New Delhi, Singapore, Washington DC: SAGE Publications Inc.