



Chain coordinators' strategic leadership and coordination effectiveness: New Zealand-Euro agri-food supply chains

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ABSTRACT

Purpose – Although suitable leadership styles are crucial for chain coordinators (CEOs, managing directors and head of departments) to achieve the effectiveness of supply chain coordination (operational and social performances contributing to financial performance), the potential caveats in New Zealand-Euro agri-food supply chains are the lack of theoretical as well as empirical investigations that scrutinize the linkages between leadership styles, their interactions and the effectiveness of supply chain coordination. The purpose of this study is therefore to address the above knowledge gap.

Design/methodology/approach – Structural equation modeling and interaction effects are applied to the data collected from chain coordinators working in the selected New Zealand-Euro agri-food supply chains (dairy, meat, fruits and vegetables).

Findings – The results indicate that a participative leadership style is more strongly correlated with the effectiveness of supply chain coordination than a directive leadership style. The directive style is also significant, which leads towards the adaption of strategic leadership practices. Interaction effects further conclude that companies perform better when their chain coordinators apply strategic leadership practices. Moreover, operational (service quality and product quality) and social (trust in and satisfaction with supply chain partners) performances are the key determinants of financial performance (increased sales, profit and market share).

Practical implications – The results enhance the understanding of chain coordinators and help them to achieve coordination effectiveness among agri-food supply chain partners. Thereby, it directs to establish the best practices for contemporary international agri-food supply chains.

Originality/value – This study provides in-depth analysis to develop a comprehensive theoretical framework, which helps to confirm the complicated linkages between the underlying constructs with the specific characteristics of New Zealand-Euro agri-food supply chains. Consequently, the results also clarify the earlier ambiguous findings from other industries and countries.

Keywords Strategic leadership, coordination effectiveness, New Zealand-Euro agri-food supply chains, chain coordinators, structural equation modeling

Paper type Research paper

1. Introduction

Leadership is a social process that helps to lead and direct supply chain partners. To manage agri-food supply chain operations, participative and directive leadership styles are commonly employed. The former style supports chain partners' involvement and believes in joint decision-making. This also values appreciation, opinions and group work. The latter leadership style characterizes with command-and-control rules representing directive management practices. The key difference between these two styles is feelings of involvement and empowerment of workforce (Mehta et al., 2003; Akhtar et al., 2012). Depending on workforce and circumstances, chain coordinators sometimes use both leadership styles simultaneously that reflect the notation of strategic leadership.

Research believes that there are significant links between leadership styles and supply chain performance (Mehta et al., 2003; Akhtar et al., 2012; Dubey et al., 2015). The productive results from empowering subordinates and sharing of decision power (i.e. characteristics of a participative leadership style) give an impression that these characteristics should be considered essentials for modern agri-food supply chain operations. For instance, Pfeffer (1998) provided evidence that a company decreased 38% of defective rates by employing an empowerment approach; as a result, the company increased its performance by 20%. In support, Mehta et al. (2003) and Akhtar et al. (2012) also stated that performance is more effective when participative practices are used rather than a directive leadership practices. By applying participative practices, General Motors and Xerox also improved their performance and showed a decreased rate in their workers' absenteeism (Ichniowski et al., 1996).

Paradoxically, a directive leadership style is also effective in some industries and regions. For example, a study conducted by Bititci et al. (2004) in the US multiple industries (rolling mill, bottled water producer, transport and distribution companies) concluded that

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3 directive leadership gives better results than participative leadership. In a similar vein,
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5 Kruglanski et al. (2007) believed that a directive style is appropriate when the nature of work
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7 is sensitive, goals are comprehensive and a leader has more experience than group members.
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10 Leadership styles, particularly a participative leadership style, help chain coordinators
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12 (CEOs, managing directors and head of departments – supply chain/marketing/channel/channel
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14 managers) to enhance the effectiveness of supply chain coordination (i.e. operational and
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16 social performances contributing to financial performance) (Akhtar et al., 2012). Chain
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18 coordinators, who are also the sample members for this study, can be defined as the key
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20 decision makers who lead, direct and control major activities. They are also involved in joint-
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22 decision making with shareholders and key supply chain partners. Moreover, a number of
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24 activities they involved in include appointing new staff, setting salary ranges, training and
25
26 managing multiple teams. Furthermore, they allocate monetary resources, specify job
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28 descriptions and facilitate their staff with necessary infrastructures for coordination among
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30 supply chain partners (Smith, 2006; Akhtar et al., 2012a). Hence, their job is deeply rooted in
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32 various activities related to the effectiveness of supply chain coordination, and the application
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34 of strategic leadership could have noteworthy effects on coordination activities among agri-
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36 food supply chain partners.
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41 Undoubtedly, studies conducted in certain industries and countries have scrutinized
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43 leadership styles and their contributions to performance dimensions. For example, in the
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45 USA, Finnish and Polish automobile industry, Mehta et al. (2003) empirically analyzed that
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47 chain coordinators' participative leadership skills positively affect financial performance.
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49 Likewise, Werder and Holtzhausen (2009) stated that both leadership styles (directive and
50
51 participative) are used at moderate level in the US public-relationship organizations. Form
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53 the selected Palestinian organizations, As-Sadeq and Khoury (2006) found that the most
54
55 frequently used leadership style is a transformational leadership style (tend to be
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3 participative), and it shows the greatest impact on performance factors such as satisfaction,
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5 willingness to exert extra efforts and effectiveness among employees.
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7 Also, Karami et al. (2006) conducted a survey in the UK electronics industry and found
8
9 positive relationships between chain coordinators' participative leadership practices and
10
11 strategy development. To explore chain coordinators' rational leadership practices, Smith
12
13 (2006) and Ness (2009) emphasized retail sectors in the UK and Norway, and they believed
14
15 that a participative leadership style is better. A study conducted by Ling et al. (2008) in the
16
17 US multiple industries concluded that participative leadership positively impacts firm-level
18
19 outcomes. Both directive and participative leadership styles are often employed and
20
21 participative leadership is strongly related to marketing practices (Ling et al., 2008; Dubey et
22
23 al., 2015).
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27 Parry and Proctor-Thomson (2002) tested the relationships between manifestations of
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29 leadership styles and effectiveness in the public sector. Direct and indirect effects of
30
31 participative leadership on outcomes were found. Within the travel industry, Bentley et al.
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33 (2012) reported that a higher intention to leave an organisation, levels of stress, higher
34
35 absenteeism and lower levels of emotional wellbeing are associated with a specific leadership
36
37 style. A study conducted by Akhtar et al. (2012) in the selected agri-food chains explored that
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39 a participative leadership style is often employed in New Zealand, but the study did not
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41 statistically estimate the linkages.
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45 Although there are various studies on leadership practices applied in certain
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47 industries/countries, how strategic leadership affects the coordination effectiveness of New
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49 Zealand-Euro (European) agri-food supply chains has not been studied. Additionally, little is
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51 known about the linkages between the dimensions – operational (i.e. service quality and
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53 product quality) and social performance (i.e. trust in and satisfaction with supply chain
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55 partners) contributing to financial performances (i.e. increased sales, profit and market share).
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3 Extant studies focus on the links between leadership styles and individual dimensions (e.g.
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5 Tipples and Furgala, 2010; Akhtar et al., 2012; Raman et al., 2015). This study thus addresses
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7 the knowledge gap theoretically as well as empirically. Theoretically, the study broadens the
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9 existing literature using an interdisciplinary research approach (i.e. reviewing studies from
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11 multiple industries), although the main focus is on agri-food related studies. This approach
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13 seems more appropriate because not enough agri-food studies have been published on the
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15 underlying constructs that develop a comprehensive theoretical framework. By reviewing
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17 background literature, this research also highlights agri-food practices applied in various
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19 countries and further justifies why New Zealand-Euro (European) supply chains were
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21 selected for this study. This leads to look at agri-food practices applied in New Zealand-Euro
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23 chains that lack empirical studies as well. Empirically, the data was collected from New
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25 Zealand-Euro supply chains (dairy, meat, fruits and vegetables; business to business
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27 operations) to test the theoretical framework and hypotheses. Consequently, it aims to answer
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29 the following questions; which leadership style (participative or directive) is more strongly
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31 correlated with the effectiveness of supply chain coordination, how these leadership styles
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33 form strategic leadership and how the dimensions are related?
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38 This article is organized in six sections. **Following the introduction, the second section**
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40 **builds arguments based on the relevant literature and develops a framework and hypotheses.**
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42 **Section three outlines the data collection procedure and exploratory statistical analysis.**
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44 **Section four describes the main results obtained from structural equation modeling. This**
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46 **article is concluded by section five that discusses the findings and implications.**
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49 **2. Theoretical insights, framework and hypotheses**

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51 A supply chain is the combination of designing, developing, optimizing and managing
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53 different components such as materials, information and financial flows and distribution of
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55 finished products. In other words, it is a way whereby products or services are moved
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between upstream and downstream (Stadtler, 2015). A supply chain is also defined as a synthesis of different activities such as inventory management, logistics and distribution of material or finished products. Managing these activities is called supply chain management (Tavella and Hjortso, 2012), in which various supply chain partners (manufacturers, processors, importers, exporters and retailers) play their role to achieve coordinated objectives (Akhtar et al., 2012).

A graphical view of an agri-food supply chain and possible flows among supply chain partners are shown in Fig. 1. The arrows represent potential interactions between supply chain partners. The chain normally consists of farmers, processors/wholesalers, retailers and consumers.

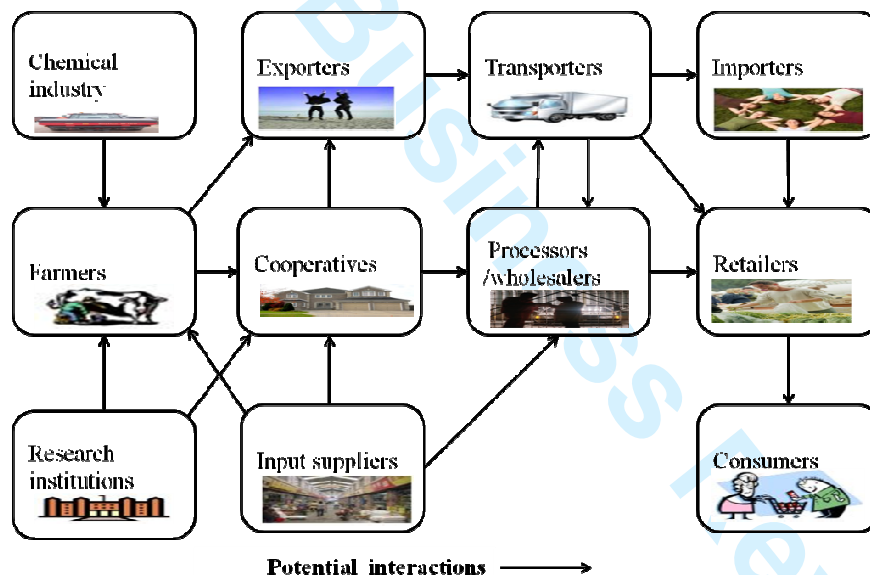


Fig .1. A graphical view of agri-food supply chains. Source: (Doukidis et al., 2007)

Chemical dealers, input suppliers and other cooperatives that often support farmers and supply material are also part of the chain. Additionally, transport companies act as logistic supporters and research institutions bring novelty by developing new products and processes. Importers and exporters are also involved in international agri-food supply chains (Doukidis et al., 2007).

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3 Additionally, agri-food supply chains are often characterized with uncertainties such as
4 weather effects, lack of information and knowledge and difficulties in finding right partners
5 and contracts. These uncertainties are controlled by effectively managing supply chain
6 activities that add values and ensure effective coordination among involved supply chain
7 partners (Tavella and Hjortsø, 2012; Stadtler, 2015).
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12 In agri-food supply chains, five different types of value chain governance structures are
13 adapted. These structures shown in Fig. 2 are market, modular, relational, captive and
14 hierarchy (Gereffi et al., 2005; Kalantaridis and Vassilev, 2011; Loconto and Simbua, 2012).
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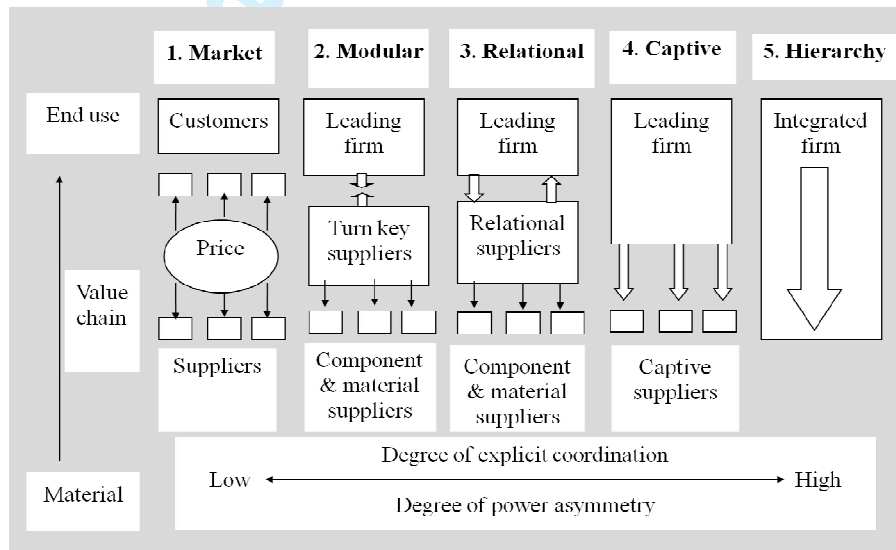


Fig. 2. Types of value chain governance. Source: (Gereffi et al., 2005)

1. Market value chains are typical spot markets where sellers have control to set prices and make other major decisions. Furthermore, the bi-directional information complexity is low and suppliers need little information from buyers. Consequently, little explicit coordination is practiced in this category.
2. In modular value chains, products are made to customer specifications. Suppliers take full responsibility of technology standardization and also simplify specifications of products,

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3 components and processes. Consequently, it reduces costs and increases speed and
4 flexibility with arm's-length coordination linkages.
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3. Relational value chains have complex interactions between buyers and sellers. Both parties focus on relationships and trust. Moreover, product specifications are higher, thus, codification is not possible and complex information is often exchanged by face-to-face communication with high levels of explicit coordination.
 4. In captive value chains, a focal firm with considerable power monitors and controls a system. The focal firm also leads in logistics, purchasing, designing and technology upgrading, and suppliers are only engaged in assembly processes.
 5. Control flow comes from managers to subordinates in hierarchy value chains. Managers make major decisions and subordinate workers have to follow them. Furthermore, product specifications cannot be codified due to the nature of complexity. It is also difficult to find competent suppliers. Therefore, often a focal firm develops products. Moreover, data and information are exchanged between value chain activities, emphasizing internal coordination and input-output processes (Gereffi et al., 2005; Kalantaridis and Vassilev, 2011; Loconto and Simbua, 2012).

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Gereffi et al. (2005) also found that coordination trends have changed towards explicit coordination in agri-food supply chains between Kenya and Europe. Relational and captive governance structures are mostly used instead of market and modular structures. In other words, arm's-length relationships and little explicit coordination practices that were focused in 1980s have been terminated (Gereffi et al., 2005; Kalantaridis and Vassilev, 2011; Loconto and Simbua, 2012). Nowadays, supermarkets in Europe and Kenya focus on explicit coordination practices, which help them to bring fresh and quality products to their customers (Gereffi et al., 2005). **Similarly, relationships in New Zealand-Euro agri-food supply chains have changed from adversarial towards closer and ongoing coordination. Chain partners share**

operational linkages and information. Moreover, buyers and suppliers work together to develop products and improve long-distanced logistics between New Zealand and Europe. However, how leadership practices are affecting coordination effectiveness in these chains is not clear (Dorling et al., 2005; Akhtar et al., 2012; Chae et al., 2014), which motivates us to develop the framework based on leadership practices and their links with coordination effectiveness.

Participative leadership practices involve supply chain partners in joint decision-making that has been an essential tool-kit for chain coordinators to manage coordination in modern agri-food supply chains. In contrast, directive leadership practices are closely associated with a hierarchical management structure that clearly provides directions about duties and rights of supply chain partners. Additionally, top management controls major decision-making and formal chains of authority and grievance actions. Also, such practices do not encourage supply chain partners to participate in key decision-making processes (Kruglanski et al., 2007).

The effectiveness of supply chain coordination depends on a participative leadership style that fastens workforce, board levels and trade unions into a single associated unit (Jung et al., 2003; Harris, 2004). Research conducted by Batt (2003) also noticeably proved a positive relationship between agri-food supply chain partners' empowerment and outcomes. Gereffi et al. (2005) and Smith (2006) further stated that chain coordinators' capability to produce, develop and sustain good relationships depends on participative leadership practices. Using such practices, chain coordinators emphasize team work and coordination among agri-food supply chain partners that are the key sources of coordination success.

Oshagbemi and Ocholi (2006) also claimed that a participative leadership style is often used in supply chains and chain coordinators work together with their partners to organize and plan supply chain strategies. For instance, joint leadership produces better coordination

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3 outcomes for Tesco and its partners, a UK-based retailer (Smith, 2006). The study conducted
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5 by Brodt et al. (2006) in the US agri-food supply chains (i.e. almond and grapes) also stated
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7 that such joint decision makers are keen to manage resources in cooperation with other
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9 supply chain partners. Leadership that focuses on the empowerment of employees and deals
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11 with them fairly gives utmost coordination effectiveness. A noteworthy positive relationship
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13 was reported between participative leadership practices and shop floor actors. The study,
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15 which included multiple industries such as food, automotive, logistics, retail, pharmacy and
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17 IT, was performed in the Netherlands (de Leeuw and van den Berg, 2011).
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21 Important non-financial benefits such as trust in and satisfaction with (i.e. elements of
22
23 social performance) supply chain partners are related to the involvement of workforces rather
24
25 than traditional leadership practices. Furthermore, in a participative style, feelings of supply
26
27 chain partners could be more effective and can assist to achieve better service quality and
28
29 financial performance in agri-food supply chains (Akhtar et al., 2012).
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32 Participative practices also build trust that plays an important role to increase the
33
34 effectiveness of supply chain coordination. Trust is associated with the expectations of supply
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36 chain partners who are keen to share something in an optimistic manner. Trusted partners in
37
38 agri-food supply chains have self-confidence and believe in the words and actions of their
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40 business partners. In such relationships, outcomes such as service quality, product quality
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42 (i.e. elements of operational performance) profit and company growth (i.e. elements of
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44 financial performance) can increase (Akhtar et al., 2012; Akhtar et al., 2012a). A study of
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46 more than 400 managers conducted in multiple industries located in Europe showed that a
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48 participative leadership style is associated with age; older managers like to consult and
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50 participate with followers but younger managers are happy to take their own decisions
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52 (Oshagbemi and Ocholi, 2006).
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3 The effective coordination outcomes such as good relationships, better market share,
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5 good service quality and increased sales (elements of operational, social and financial
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7 performance) are the results of trusted and satisfied chain partners. The development in these
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9 components motivates supply chain partners to grow their businesses, which totally depend
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11 on impartial dealings and balanced leadership practices among agri-food supply chain
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13 partners (Oshagbemi and Ocholi, 2006; Tavella and Hjortsø, 2012).
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16 In contrast to participative leadership, a directive leadership style makes it difficult to
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18 coordinate and cooperate with supply chain partners; as a result, it results in isolation and
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20 affects social performance of supply chain partners (Mehta et al., 2003). However, a study
21
22 conducted by Bititci et al. (2004) showed that a directive leadership style produces better
23
24 outcomes. In supporting the findings, Werder and Holtzhausen (2009) showed that
25
26 participative leadership is negatively related with performance. However, both leadership
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28 styles (participative and directive leadership styles) are employed at modest levels. These
29
30 findings suggest strategic leadership, which is a combination of both participative and
31
32 directive leadership styles that are changed depending on the content of business operations,
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34 workforce and circumstances (Werder and Holtzhausen, 2009). Comparing Danish decision
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36 makers, Hansen and Jones (1996) stated that a participative leadership style is often used by
37
38 the managers who work in public sectors whereas a directive leadership style is mostly used
39
40 in private companies. Moreover, Randeree and Ghaffar-Chaudhry (2012) believed that a
41
42 participative leadership style has stronger effects on supply chain performance in the United
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44 Arab Emirates. Research also suggests that a directive style is suitable when circumstances
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46 are sensitive, goals are clear and a leader is more experienced than followers. Although
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48 leadership styles also differ from country-to-country as can be seen from the arguments, the
49
50 majority of studies discussed above shows more support for participative leadership practices.
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52 Hence, it can be summarized by positing the following hypothesis:
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3 H₁: Chain coordinators' participative leadership style results in a higher significant
4 relationship (i.e. correlation) with coordination effectiveness than directive leadership
5 style.
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10 Two dimensions of coordination effectiveness consist of operational performance (i.e.
11 relative service quality and product quality) and social performance (i.e. relative satisfaction
12 with and trust in supply chain partners). These dimensions significantly influence financial
13 performance of agri-food supply chains (i.e. relative profit, sales and market share) (Korten,
14 1998; Dorling et al., 2005; Gereffi et al., 2005; Aramyan et al., 2007; Jones et al.,
15 2013; Merad et al., 2013; Edgeman et al., 2015). The relationships between these dimensions
16 have only been partially examined (Akhtar et al., 2012). For instance, a study of over 200 US
17 firms conducted by Lado et al. (2011) stated a significant positive relationship between
18 service quality and financial performance. In supporting the arguments, Sichtmann et al.
19 (2011) also stated that service quality significantly affects monetary outcomes. However,
20 both studies did not encompass other key theoretical constructs related to performance
21 dimensions.
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36 It is also suggested that components related to service quality and product quality
37 (delivery in a timely manner, order filling rates and flexibility) are the key operational
38 outcomes of agri-food supply chains and they increase sales, market share and profit (Chen
39 and Paulraj, 2004; Aramyan et al., 2007). In fact, service quality and produce quality are
40 interconnected with operational flows that enable agri-food supply chain partners to build a
41 better match between financial resources and demands. Effective service quality and product
42 quality further increase inventory turnover (i.e. sales) and reduce extra costs that directly
43 contribute to financial performance (Gereffi et al., 2005; Akhtar et al., 2012). The study
44 conducted by Brodt et al. (2006) in the US agri-food supply chains (i.e. almond and grapes)
45 also stated that operational quality helps to enhance financial cooperation among supply
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3 chain partners, who give higher priority to the preservation of product and service quality
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5 positively affecting financial outcomes.
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8 Operational performance factors such as product characteristics and service quality
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10 serve antecedents to financial outcomes. Operational quality-oriented small Australian
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12 manufacturing firms also support this notation. The longitudinal panel data demonstrated that
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14 such quality conscious firms (either in service or product quality), achieve better financial
15
16 performance compared to those which less focus on operational aspects (O'Neill et al., 2016).
17
18 The above arguments lead to the following hypothesis.
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21 H₂: There is a significant positive relationship between operational performance and
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23 financial performance.
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26 Additionally, social components such as trust in and satisfaction with agri-food supply chain
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28 partners are associated with financial performance. Trustworthy and satisfied agri-food
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30 growers and market agents constantly add value by coordinating activities (Batt, 2003). The
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32 outcomes are high-performing supply chains in which profit is increased (Catteeuw et al.,
33
34 2007). Also, trust positively affects financial performance and is used to achieve better
35
36 overall performance (Batt, 2003).
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39 Supply chain partners often consider that social factors such as trust and satisfaction are
40
41 the main tools to solve coordination issues and believe that these tools assist them to sustain
42
43 long-term business coordination. They further think that such tools can also help them to
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45 create and deploy co-specialized business processes, contributing to financial resources and
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47 performance. However, this might not be the case in all industries. For instance, Keisidou et
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49 al. (2013) found that neither customers' satisfaction nor loyalty has a significant relationship
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51 with financial performance in the Greek banking sector.
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54 However, various studies (e.g. Batt, 2003; Chen and Paulraj, 2004; Edgeman et al.,
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56 2015) find positive links between social factors (i.e. trust and satisfaction) and financial
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performance. They believe that satisfaction and trust provide feeling of equitability with supply chain partners and these are the key determinant of financial performance. Ferro et al. (2016) also stated that trust in and satisfaction with supply chain partners are interrelated and collectively contribute to financial factors such as sales, profit and market shares. In fact, these factors are among prime reasons for supply chain partners to work together and increase their financial performance (e.g. revenue and profit). From the above discussion, the following hypothesis is proposed.

H₃: There is a significant positive relationship between social performance and financial performance.

To sum up, the proposed models shown in Fig. 3 shows the constructs and their interrelationships discussed above. Chain coordinators' (CCs) participative and directive leadership styles are considered as independent variables. These leadership styles are the key determinants of coordination effectiveness. Coordination effectiveness, a dependent variable, consists of operational and social performances significantly contributing to financial performance.

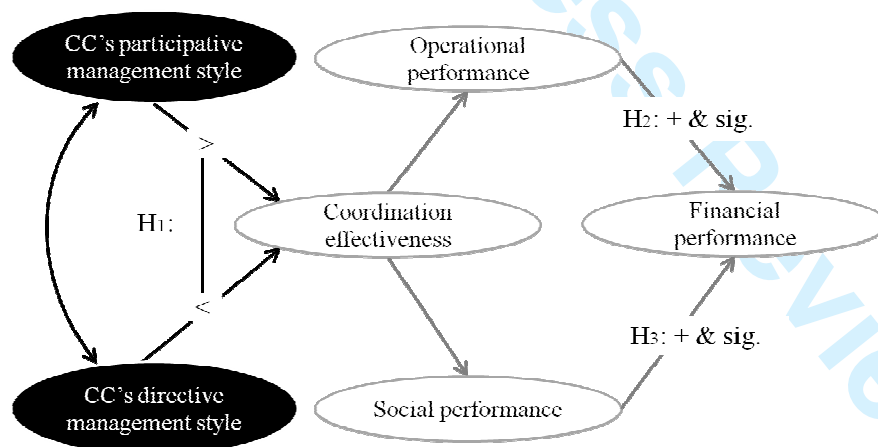


Fig. 3. Framework of leadership styles and coordination effectiveness

3. Methodology

3.1 Sample procedure

New Zealand-Euro agri-food supply chains/products/produce (dairy, meat, fruits and vegetables), detail provided by the KOMPASS database, were chosen. The database is updated monthly and contains contact details of more than 2.3 million companies (KOMPASS, 2016). The sample members, chain coordinators (CEOs, managing directors and head of departments), from the selected supply chains were originally identified in a study conducted by Akhtar et al. (2012). The detailed procedure of identification can be seen from their study. Moreover, the purposive sample was used due to certain reasons. Only those sample members were selected who meet our research criteria. The criteria included the definition of SMEs, a number of chain partners' consultations with chain coordinators for major decision-making and the number of activities chain coordinators handled (each ≥ 3). The activities included stock controlling, supply of products, contracting, pricing, auctions management, business research, marketing, relationships management, preparing relevant reports and improving performance based on performance reports. The variables detecting these criteria were presented in the questionnaire.

The selected New Zealand-Euro agri-food chains/produce play a pivotal role and these are selected because of the following reasons. First, as provided evidence earlier, not enough research has been conducted in the selected supply chains to scrutinize the linkages between the underlying constructs. Second, these are the major agri-food produce that are traded between New Zealand and Europe (NZ, 2010; Pérez and Cambra-Fierro, 2015). Additionally, the agri-food products, mainly the above selected products, contribute more than half of the merchandise exported from New Zealand. These chains also produce about 16% of GDP and employ approximately 15% of the workforce in New Zealand, and the New Zealand-Euro trade connected with these chains significantly contributes to European GDP and

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3 employment (Pérez and Cambra-Fierro, 2015). Third, New Zealand dairy mainly depends on
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5 export markets; almost 95% of its entire dairy produce is exported, contributing about 35% of
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7 global dairy trade (NZMFA, 2011). Fourth, New Zealand economy makes about 3 billion US
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9 dollars from meat exports, which mainly comes to Europe (NZ, 2010). Also, New Zealand
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11 was recently ranked third in the world for producing mutton and lamb and thirteenth for beef
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13 production (Tanaka, 2005). For lamb, New Zealand is also considered as the world's largest
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15 exporter and contributes more than 40% to the global exports, the European Union is the
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17 major trader of this percentage (Ledgard et al., 2011). Further, New Zealand exports more
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19 than 64% of its total apple production to over 65 countries, including main European
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21 countries (MAF, 2011). The country is also one of the largest green onion exporters to
22
23 Europe (FAO, 2012). Thus, conducting research on such chains credibility justifies this study.
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25 It does not only explore leadership and coordination links affecting New Zealand-Euro chains
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27 but also highlights global issues as the selected supply chains have global impacts.
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32 A questionnaire for identified chain coordinators was developed based on the literature.
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34 Five-point Likert scales (strongly disagree: 1 and strongly agree: 5) were used to facilitate
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36 respondents to know their degree of agreement or disagreement. The questionnaire was also
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38 tested and clarity issues were resolved. During the pilot survey process, the respondents also
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40 mentioned that a questionnaire-based survey was more appropriate and time efficient.
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43 A total of 600 copies of the questionnaire were sent to chain coordinators, and the survey
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45 yielded a response rate of 37.5% (225 responses) after excluding unusable responses. A
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47 number of efforts (using of short and concise statements, possible in-person visits to collect
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49 and deliver the questionnaire, offering incentives, avoiding busy periods of the year, giving
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51 ample time to fill in the questionnaire and utilizing university letterheads) were made to
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53 produce a enough sample size (225 responses) to apply structural equation modeling (SEM).
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55 The issue of sample size in SEM especially depends on the complexity of a model, and a
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3 sample size closer to 200 is often recommended (Marsh et al., 2004; Coffman and
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5 MacCallum, 2005; Goodhue et al., 2007; Kline, 2011).
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7 **3.2 Measures**

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10 The constructs and items employed in this study are listed in Appendix. Each construct
11
12 consists of three measures (items) except for product quality and satisfaction – each was
13
14 measured using four items. The *Participation leadership style* was measured by asking to
15
16 what extent lower/middle management affects policies and standards. Three items (i.e.
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18 encouraging uniform procedure, spelling out rights and obligations and providing sufficient
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20 guidelines and instructions) were used to represent the *directive leadership style*. These
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22 constructs were adapted from Mehta et al. (2003).
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25 The dependent variable, *coordination effectiveness among supply chain partners*, was
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27 measured by five constructs, namely service quality, product quality, trust, satisfaction and
28
29 financial performance. *Service quality* was measured by assessing delivery on time, 100%
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31 order fulfillment rate and order flexibility. The items were originally used by Aramyan et al.
32
33 (2007). By using items from the previous studies (Amoako-Gyampah, 2003; Akhtar et al.,
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35 2012), *product quality* was measured by employing scales product defective rate, products
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37 safety, products reliability and impacts on environment. Items to measure *satisfaction* were
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39 taken from a study conducted by Cullen et al. (1995). *Trust* consisted of chain coordinators'
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41 confidence with main partners, the best interest being considered and how often promises
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43 were fulfilled (Batt, 2003). The measures of *financial performance* were profitability, sales
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45 and market growth. The items were taken from Aramyan et al. (2007).
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49 **3.3 Descriptive statistics, data reliability, validity and SEM**

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52 SPSS and AMOS were used to compute descriptive statistics, reliability and validity tests,
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54 exploratory factor analysis and SEM. The demographic characteristics of respondents are
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56 given in Appendix. The statistical tests revealed that the data met the distributional
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3 assumptions (means/medians comparisons; skewness and kurtosis within the suggested
4 limits) and also supported the reliability and validity criteria recommended by different
5 researchers such as Kline (2011). The exploratory factors were extracted by using
6 eigenvalues ≥ 1 and observing scree plots. The eigenvalues for directive and participative
7 leadership styles were 1.75 and 2.72, and the factors explained 73.98% of the variance of
8 leadership styles. The eigenvalues of service and product quality, satisfaction, trust and
9 financial performance ranged between 1.09–2.92 and the explained variance varied from
10 56.3% to 70.6%. During the process, one item (Prq4) was deleted because of low loadings.
11 Moreover, Cronbach α values were larger than the recommended value of 0.70 (the values
12 were between 0.74 and 0.83) and thus these statistics supported the reliability of our measures
13 (Kline, 2011).
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27 A recommended two-stage approach was used to perform SEM. The first stage evaluated
28 measurement models and the second stage assessed hypothesized linkages. First, the
29 underlying measurement models were checked for validity. For leadership styles, a non-
30 significant χ^2 (p -value = 0.39) was obtained and a number of other measures (CFI = 0.99, TLI
31 = 0.99 and RMSE = 0.02) showed that data did fit the model very well. The factor loadings
32 varied from 0.74 to 0.85. The non-significant χ^2 values were estimated for the measurement
33 models of operational (service quality and product quality), social (satisfaction and trust) and
34 financial (profit, sales and market growth) performance. The loadings ranged between 0.64 to
35 0.92, and the values of construct reliability (0.77–0.83) and average variance extracted (0.51–
36 0.62) were greater than suggested values. Moreover, the correlation between the respective
37 constructs did not cross the threshold value of 0.85, which means the items showed
38 discriminant validity. Discriminant validity was also checked by estimating whether the
39 average variance explained (AVE) for each pair of the constructs was greater than the square
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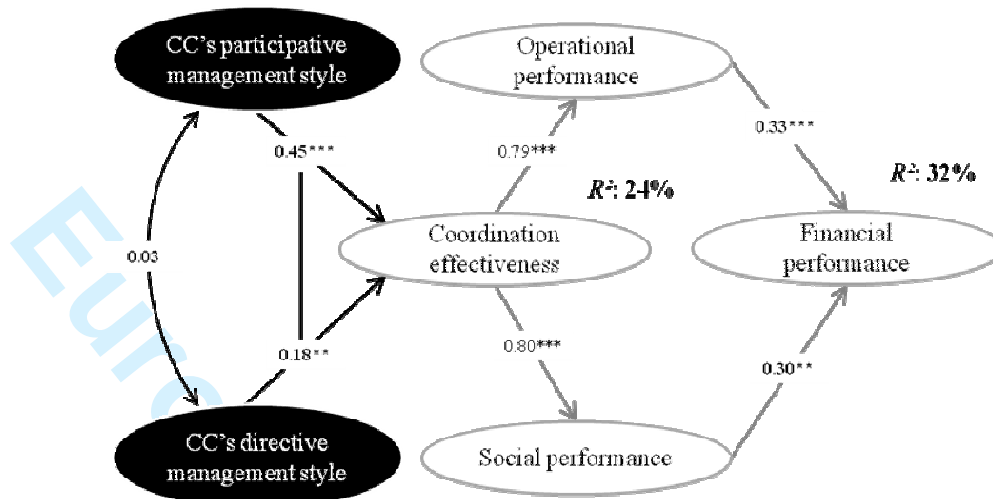
of the correlation between the constructs. The condition was satisfied by all underlying constructs. Thus, the measures satisfied validity criteria (Kline, 2011).

A parceling approach was utilized to reduce the number of indicators (i.e. for coordination effectiveness only) and to achieve the main purpose of the research (i.e. investigating the structural relationships between the constructs rather than the relationships between the measurement variables). Parceling is defined as a process of averaging item scores for a respective factor (Bandalos, 2002). A number of researchers (Marsh et al., 1998; Bandalos, 2002; Koubaa et al., 2014) stated that results achieved from parcels rather than original variables provide proper solutions and relevant information. It is also claimed that parceling is particularly suitable when a study focuses on the structural parts (Kline, 2011).

4. Results

4.1 SEM results and strategic leadership

The SEM results estimated, including standardized path coefficients and R^2 values, from the structural model are depicted in Fig. 4. It can be seen that *CCs' leadership styles are important determinants for coordination effectiveness among supply chain partners*. Their *participative leadership style* shows a highly significant relationship ($\beta = 0.45$; $p = 0.00$; $C.R=4.12$) whereas *directive leadership style* depicts a significant relationship ($\beta = 0.18$; $p = 0.04$; $C.R=2.08$), which is further supported by F-test ($F = 1.44$; $p = 0.00$; $\bar{x} = 3.88$ & 3.67). In other words, *CCs' participative leadership style results in higher significant relationship with coordination effectiveness than directive leadership style*. Both leadership styles are significant and suggest applying strategic leadership, which is further investigating using interaction effects and presented in the discussion section. The variables together explain 24% of the variance of *coordination effectiveness*.



*** (***) statistically significant at $p < 0.01$ ($p < 0.05$); $n = 225$

Fig. 4. SEM results for the framework

Additionally, *operational performance* (service quality and product quality) seems an important determinant for *financial performance*. The path coefficient is significant ($\beta = 0.33$; $p = 0.00$). *Social performance* (trust in and satisfaction with supply chain partners) is also vital and is significant at $p = 0.05$. The variables together explain 32% of the variance in financial performance.

The SEM results were also supported by the model fit indices listed in Table 1. A non-significant χ^2 ($p = 0.06$) with a set of other indices (CFI = 0.98; IFI = 0.98; TLI = 0.97; GFI = 0.96; PCFI = 0.68 and RMSE = 0.04) showed a good fit for the model.

A summary of the hypotheses that answer the research questions is provided in Table 2. Question one stated that which leadership style (participative or directive) shows a stronger association. This question is addressed by H_1 which proposed that chain coordinators' participative leadership style shows a stronger relationship with coordination effectiveness than directive leadership style.

Table 1. Suggested and resulted fit indices

Fit indices	Recommended values	Obtained values
χ^2	–	52.21
Degree of freedom (df)	–	38
p-value	> 0.05	0.06
Parsimonious fit index (PCFI)	> 0.50	0.68
Parsimonious fit index (χ^2/df)	< 5 or 3	1.37
Goodness of fit index (GFI)	> 0.95	0.96
Comparative fit index (CFI)	> 0.95	0.98
Incremental fit index (IFI)	> 0.95	0.98
Tucker Lewis fit index (TLI)	> 0.95	0.97
Root mean square error of approximation	< 0.06	0.04

Source: (Kline, 2011) and results of this study

Based on the results shown in Table 2, Fig.4, and F-test, it is concluded that chain coordinators' participative leadership style results in a higher significant relationship ($\alpha = 0.01$; 99% probability, $C.R = 4.12$) than directive leadership style ($\alpha = 0.05$; 95% probability) $C.R = 2.08$). In other words, chain coordinators who use a participative leadership style are more likely to achieve the effectiveness of supply chain coordination.

Table 2. Hypotheses, questions, and answers

Hypotheses	Supported (yes/no)	Questions/answers
1: CCs' participative leadership style results in a higher significant relationship with coordination effectiveness than directive leadership style.	Yes	Q: Which leadership style shows stronger relationship with coordination effectiveness? A: <i>Participative</i>
2: There is a significant positive relationship between operational performance and financial performance.	Yes	Q: How are the dimensions of coordination effectiveness related?
3: There is a significant positive relationship between social performance and financial performance.	Yes	A.: <i>Significantly and positively</i>

Hypotheses 2 and 3 assumed that operational and social performances show significant relationships with financial performance. Both hypotheses are supported; *operational*

performance \rightarrow financial performance at $\alpha = 0.01$ and social performance \rightarrow financial performance at $\alpha = 0.05$.

To answer how participative and directive leadership styles lead to adapt strategic leadership (i.e. mixing of leadership styles depending on circumstances), we further investigated the relationship between high-intensive use of strategic leadership and the dimensions of performance (financial and non-financial performances). The surveyed companies were categorized into high and low intensity of strategic leadership. The t-test showed that the grouping is significantly different (at $p < 0.00$) with means (\bar{x}) 3.81 and 4.75 for low strategic leadership users and high strategic leadership users respectively. The results conclude that better financial and non-financial performances (Non-FP) come when firms apply more strategic leadership practices. These relationships are also shown in Fig. 5.



Fig.5. Interaction effects and strategic leadership

5. Conclusion, discussion and implications

This study scrutinizes the linkages between chain coordinators' leadership styles and the effectiveness of supply chain coordination (operational and social performances contributing to financial performance). It further investigates the relationships between

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3 operational, social and financial performances. This research finally presents how
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5 participative and directive leadership styles together lead towards strategic leadership.
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8 Contemporary New Zealand-Euro agri-food supply chains practice explicit
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10 coordination, and this finding is consistent with other global supply chains (Gereffi et al.,
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12 2005; Kalantaridis and Vassilev, 2011; Loconto and Simbua, 2012). It seems that arm's-
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14 length relationships and little explicit coordination practices are not suitable for long-
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16 distanced supply chains. In these supply chains, business partners share operational linkages
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18 and information through participative leadership because such practices keep them united and
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20 strengthen their coordination effectiveness. The results are consistent with other studies (e.g.
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22 Jung et al., 2003; Harris, 2004) and are vital for chain coordinators in the context of changing
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24 leadership styles in modern agri-food supply chains. Such leadership improves performance
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26 factors such as service quality and product quality, trust in and satisfaction with chain
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28 partners. Consequently, this positively affects profit, sales and market growth. In other words,
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30 firms that involve their supply chain partners in major decision-making show better
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32 performance.
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36 Directive leadership is also important as highlighted by others (e.g. Bititei et al., 2004).
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38 This approach is particularly useful when it is practiced together with participative
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40 leadership, leading towards strategic leadership that is applied adaptively depending on the
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42 content of business operations and sensitivity of underlying conditions. Chain coordinators,
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44 who often use strategic leadership, are involved in inter and extra coordination and therefore
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46 their roles are crucial to keep long-distanced supply chains connected and integrated by using
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48 strategic leadership.
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52 Three-fold implications resulted in from this research are as follows. First, if the
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54 workforce is more knowledgeable and experienced, participative leadership seems to be the
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56 future of modern agri-food supply chains and these chains are becoming more demanding
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3 and complex and de-centralized decision-making can play a significant role in such supply
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5 chains. Firms hire people because of their capability, ability and intelligence. Then, why not
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7 give them opportunities to use these strengths, and participative leadership is an excellent tool
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9 to achieve this objective. Hence, participatory leadership practices are anticipated to provide
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11 a leading advantage. Second, a directive leadership style is often employed in emerging
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13 markets (Akhtar et al., 2012). New Zealand-Euro chains consist of a multicultural society
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15 (See for detail: Hofstede and Bond, 1984). Thus, directive leadership is also used in the
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17 selected agri-food supply chains. Based on the results, it can be concluded that chain
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19 coordinators need to use a strategic leadership approach, which is a combination of both
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21 participative and directive leadership styles. This particularly depends on the quality of a
22
23 workforce, experiences, the nature of businesses and circumstances. Third, the findings also
24
25 suggest that operational and social outcomes are becoming pivotal to enhance financial
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27 performance. These outcomes are the powerful determinants that directly affect financial
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29 performance. If chain coordinators emphasize these multi-dimensions together with strategic
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31 leadership, they will get better financial results and this is the key note that chain coordinators
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33 should take on board.

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38 The study limitations are applied for cross-sectional research in general. However, our
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40 study uses an interdisciplinary literature review approach. This means that the study has
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42 implications for other industries as well, particularly which share similar characteristics.
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44 Future studies might investigate the underlying interrelationships in greater detail using in-
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46 depth case studies that can further support a general perspective. Also, our empirical results
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48 are based on the selected SMEs; the findings might be different for large firms. Particularly,
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50 social performance could react differently as large firms are more inundated with data and
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52 information that might have significant impacts on social performance among supply chain
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54 partners. Thus, future research should focus on these aspects.
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Appendix

Table 3. Scales used in this study

Construct and studies	Brief item description	Codes
Participative leadership style (Mehta et al., 2003)	• Middle and lower management influence determination of policies	Pls1
	• Middle and lower management do not pass ideas to top management (*)	Pls2
	• Middle and lower management sometimes determine promotional allowances	Pls 3
Directive leadership style (Mehta et al., 2003)	• Top management encourages to use uniform	Dls1
	• Top management does not spell out rights and obligations (*)	Dls2
	• Top management provides sufficient guidelines and instructions depending on circumstances	Dls3
Operational performance: Service quality (Aramyan et al., 2007)	• Provide deliveries on time	Srq1
	• Do not fulfill 100% orders with accuracy (*)	Srq 2
	• Offer very flexible options for changing orders' quantity	Srq 3
Product quality (Amoako-Gyampah, 2003; Akhtar et al., 2012)	• Product defective rate is very low	Prq1
	• Provide 100% products safety certification	Prq2
	• Very reliable products are not offered (*)	Prq3
	• Impact of practices on natural environment is reducing	Prq4
Social performance: <i>Satisfaction</i> with main chain partners (Cullen et al., 1995)	• Relationships with main partners are satisfactory	Sat1
	• Main partners are not good companies for business (*Rev)	Sat 2
	• Are satisfied with main-partners' performance	Sat 3
	• Have successful coordination with main partners	Sat 4
Trust in main chain partner (Batt, 2003)	• Do not have high confidence in main partners (*)	Tst1
	• Main partners always consider our best interests	Tst2
	• Main partners do not always keep their promises (*)	Tst3
Financial performance (Aramyan et al., 2007)	• Profitability growth is high	Fin1
	• Sales growth is increasing	Fin2
	• Market share growth is reducing (*)	Fin3

*: Items reversed. The items used in this research were compiled from the previous studies and adjusted to the purpose of this research. In other words, the items are not exactly the same as described in the literature.

Table 4. Characteristics of respondents

Title (chain coordinators)	Freq.	Age	Freq.	Edu. (degree)	Freq.	Exp.	Freq.
Directors	72	<30	2	Postgraduate	118	1–8	6
Supply chain managers	59	30–39	22	Undergraduate	92	9–16	76
CEOs	47	40–49	89	A-level/high	13	17–24	60
Marketing managers	29	50–59	72	Primary School	2	25–32	62
Channel or chain managers	18	>60	40	–	–	33–40	21
Total	225	–	225	–	225	–	225

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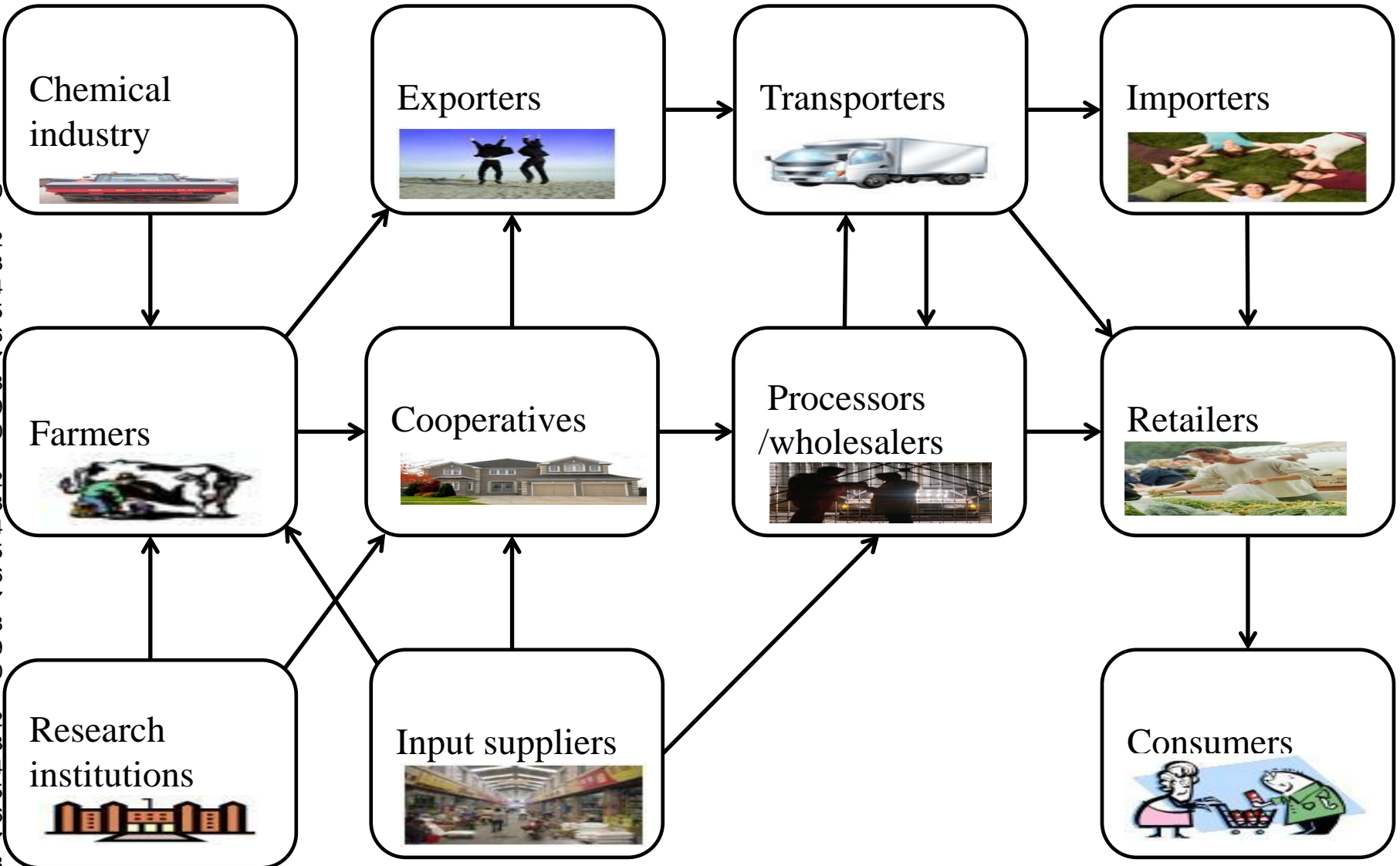
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Fig.1. agri-food supply chains



Potential interactions →

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Fig.2. Types of Value Chain Governance

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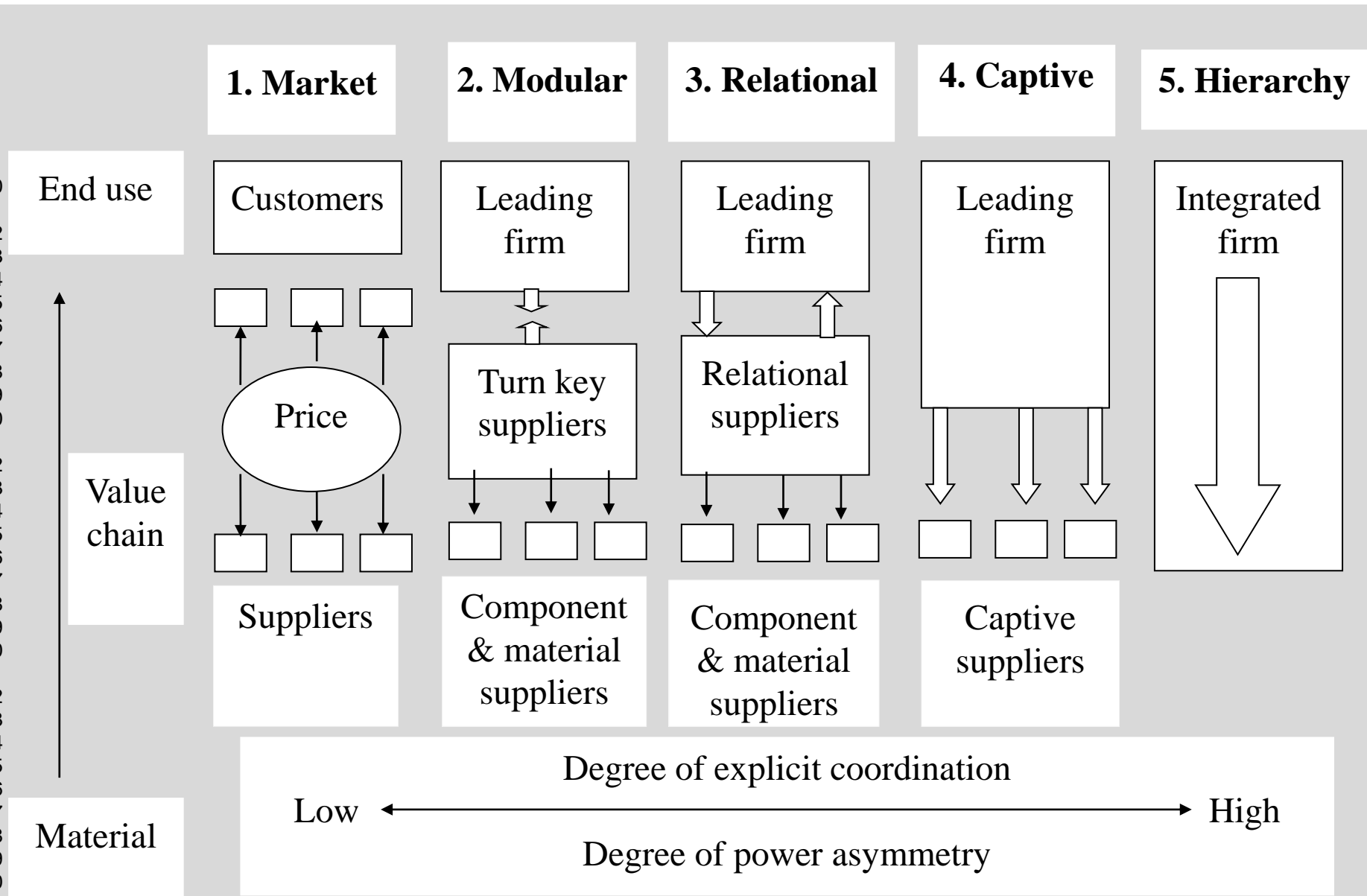


Fig. 3. Framework

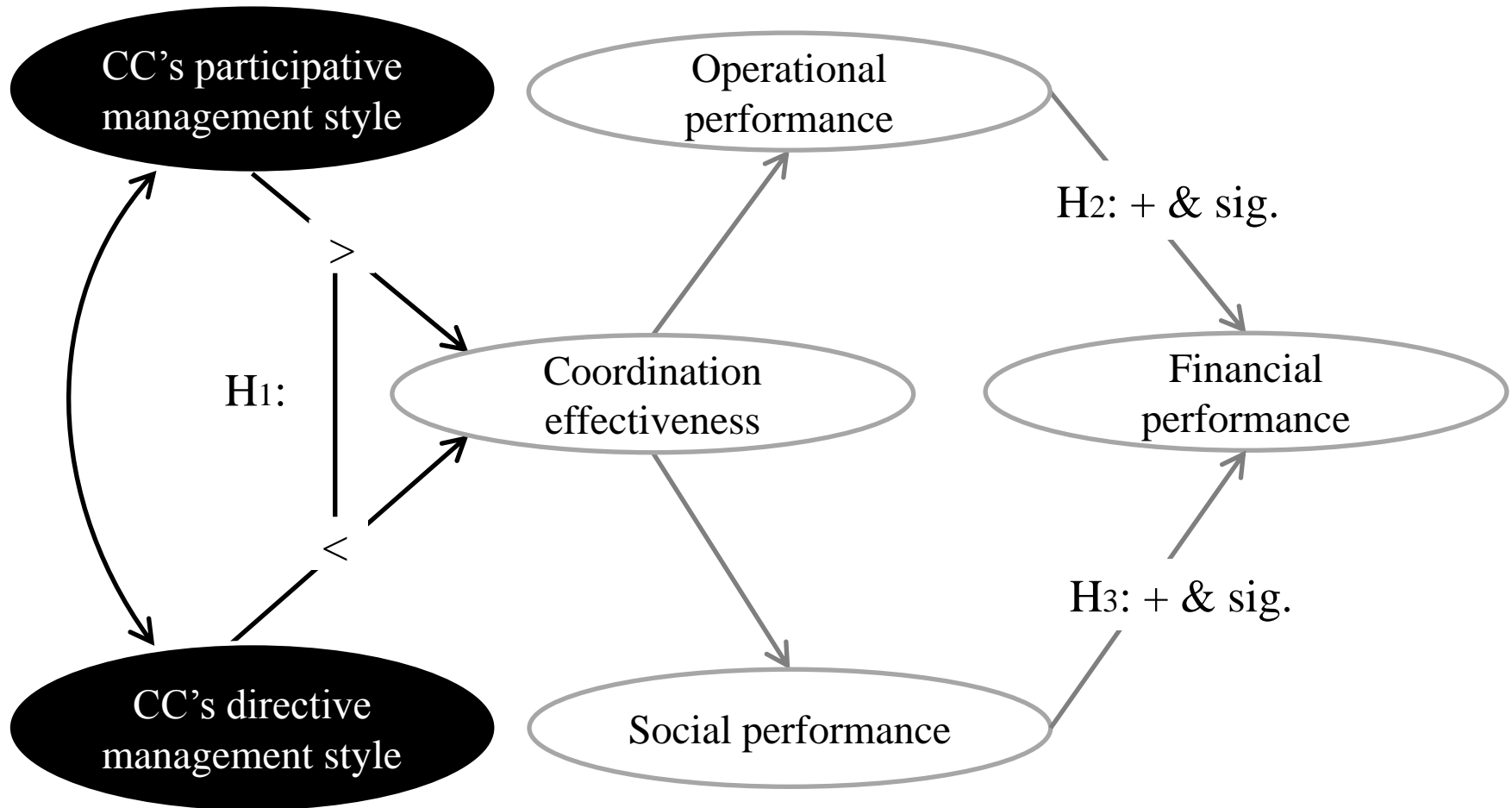
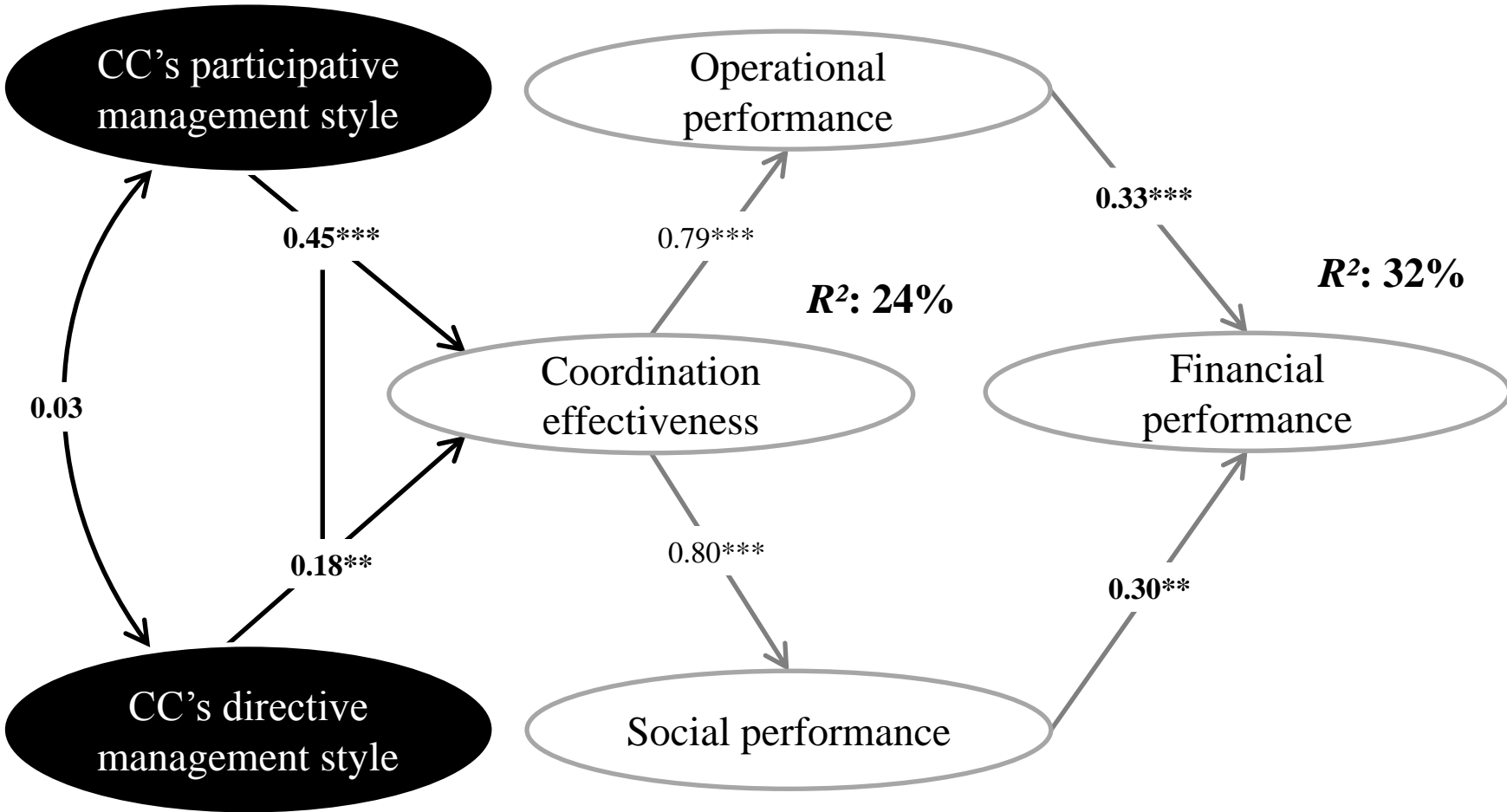
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Fig.4. SEM results



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