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**SURVEY EVIDENCE OF MEMBERS'  
WILLINGNESS TO INVEST IN  
AGRICULTURAL HYBRID COOPERATIVES**

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## **Tiivistelmä**

Maatalouden tuottajaosuuskunnat kohtaavat kovaa kilpailua globaaleilla ruoka- ja maatalousmarkkinoilla. Osuuskuntamuotoisen yrityksen mahdollisuudet hankkia kasvupääomaa rajoittuvat jäsenten pääomapanoksiin, mikä asettaa ne rahoituksellisesti heikompaan kilpailuasemaan suhteessa sijoittajaomisteisiin osakeyhtiöihin. Vastauksena kilpailupaineisiin monet kansainväliset osuuskunnat ovat luoneet innovatiivisia yhtiörakenteita. Perinteisen osuuskuntamuodon hylkäämisen motiivina on ollut usein kasvupääoman hankkimisen mahdollistaminen osuuskunnan ulkopuolisilta sijoittajilta. Tässä tutkimuksessa tarkastellaan maanviljelijöiden, jotka ovat maatalouden tuottajaosuuskuntien jäseniä ja omistajia, halukkuutta tarjota kasvupääomaa osuuskunnalle. Käyttämällä tutkimusaineistona kahden suuren suomalaisen lihantuottajaosuuskunnan jäsenkuntaa pystyttiin hyödyntämään asetelmaa, jossa jäsenillä on sekä suoraa että epäsuoraa omistusta tuottajaorganisaatiossa. Tutkimus toteutettiin ehdollisen pisteyttämisen menetelmällä kyselynä, jossa viljelijät ilmaisivat tavan, jolla he olisivat halukkaita sijoittamaan hybridiorganisaatioon. Tulokset osoittavat, että suurin osa kyselyyn vastanneista viljelijöistä oli halukkaita sijoittamaan pääomaa ja että tilakoon kasvaessa sijoitushalukkuus lisääntyi. Summa, jonka viljelijät ilmaisivat olevansa halukkaita sijoittamaan, on keskimäärin huomattava suhteessa jäsenen keskimääräiseen nykyiseen pääomapanokseen osuuskunnassa. Perinteinen osuuspääoma-muotoinen sijoitus osoittautui suosituimmaksi sijoitustavaksi. Vastaajat eivät sitä vastoin osoittaneet yhtä suurta kiinnostusta tarjottuja vaihtoehtoisia sijoitusmuotoja kohtaan, minkä perusteella voidaan päätellä, etteivät suomalaiset viljelijät olisi vielä valmiita ottamaan laajamittaisesti käyttöön siirrettäviä osuuskunnan osakkeita. Päättävävällän säilymistä tuottajilla pidettiin tärkeänä. Tutkimuksessa havaittiin jäsenten sitoutumisen olevan koetuksella, kun yrityksen oletettiin ajautuvan taloudellisiin ongelmiin ja tarvitsevan tästä syystä lisäpääomitusta. Jäsenet olivat valmiita tarjoamaan vähemmän pääomaa yrityksen pelastamiseen verrattuna positiivisesti esitettyyn toiseen hypoteettiseen sijoitustilanteeseen, jossa pääomaa käytetään yrityksen investointeihin ja kilpailukyvyn parantamiseen.

**Avainsanat:** *hybridiosuuskunta, sijoitushalukkuus, tuottaja-omistaja, ehdollisen pisteyttämisen menetelmä.*

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### **Abstract**

Agricultural producer organizations face tight competition in global food and agricultural markets. The opportunities of cooperatives to acquire growth capital are restricted to member contributions, which poses a financial handicap in competition against investor-owned firms. Innovative cooperative structures have emerged as a response to the competitive pressures. Gaining access to growth capital from investors has for many been the reason to depart from the traditional cooperative organizational structure. This study examined whether farmers, as members and owners of agricultural producer cooperatives, are willing to invest in cooperative growth. Using the members of two large Finnish meat producer cooperatives as a sample enabled us to utilise the variability in IOF structures, in which the members have both direct and indirect ownership in two layers of the agricultural producer organization. A questionnaire study was conducted, including a contingent rating task in which farmers stated the point in the hybrid organization chain in which they preferred to invest. The results indicated that the majority of farmers were willing to invest and the tendency increased with farm size. The average investment sum is considerable relative to the current capital contribution of an average member. The most preferred form was traditional cooperative capital, while a comparison of investment alternatives suggested that farmers are not yet receptive to new transferable cooperative shares. Retaining control appears important to producers. Farmer commitment erodes when the firm is in financial difficulties. Less member capital is available to save the firm from a cash crisis compared to a scenario of investments improving competitiveness.

**Keywords:** *hybrid cooperatives, willingness to invest, farmer-owners, contingent rating.*



## YHTEENVETO

Tässä tutkimuksessa tarkastellaan maatalouden tuottajaosuuskuntien jäsenten halukkuutta sijoittaa osuuskuntaan. Uusi osuuskuntalaki antaa mahdollisuuden kehittää perinteisestä osuuspääomamuotoisesta sijoituksesta poikkeavia vaihtoehtoisia jäsenpääoman sijoittamisen muotoja.

Niin sanotuissa hybridiosuuskunnissa, joita ovat suomalaiset lihantuottajien osuuskunnat, jäsenellä on pääomaa sijoitettuna sekä suoraan osuuskuntaan että välillisesti ruoan jalostuksesta ja markkinoinnista vastaavaan osuuskunnan omistamaan osakeyhtiöön. Vaikka maatalouden tuottajaosuuskuntien uudentyyppisistä organisaatorakenteista on paljon kansainvälistä tutkimuskirjallisuutta, tuottajien näkemyksiä osuuskuntayrityksiin sijoittamisesta ei tunneta vielä hyvin. Yritysten kasvun ja kansainvälistymisen rahoituksen kehittämiseksi on tärkeää tunnistaa, missä muodossa osuuskunnan jäsenet olisivat halukkaita osallistumaan kasvun rahoitukseen.

### *Perinteinen osuuspääomasijoitus oli kyselyaineistossa suosituin sijoitusmuoto*

Lihantuottajille suunnatun kyselytutkimuksen tulosten perusteella suurin osa kyselyyn vastanneista viljelijöistä oli halukkaita sijoittamaan osuuskuntayritykseen. Keskimääräinen raportoitu sijoitushalukkuus oli noin 8.000 euroa. Sijoitushalukkuus oli sitä korkeampi, mitä suurempi oli tilakoko. Tuottajat, jotka luokiteltiin tutkimuksessa suuriksi raportoidun tilakoon perusteella, ilmaisivat kyselyssä nollaa suuremman euromäärän useammin kuin pieniksi tai keskikokoisiksi luokitellut tuottajat. Tuottajat, jotka ilmoittivat aikeekseen lopettaa tilanpidon lähitulevaisuudessa, olivat muita haluttomampia tarjoamaan kasvupääomaa osuuskuntayritykselle.

Sijoitushalukkuutta selvitettiin kyselylomakkeella esitettyjä neljää vaihtoehtoista sijoitustapaa kohtaan. Ne erosivat toisistaan omistus- ja äänioikeuden suhteen, ja lisäksi osa niistä tarjosi mahdollisuuden pääoman arvonnousulle ja osa sijoitusinstrumenteista oli mahdollista luovuttaa eteenpäin. Tarjotuista sijoitusvaihtoehdoista suosituimmaksi osoittautui perinteinen osuuspääomasijoitus. Suureksi luokitellut viljelijät osoittivat kiinnostusta vaihtoehtoon, joka kuvasi uudenlaista osuuskunnan osaketta, mutta muuten muut vaihtoehdot eivät saavuttaneet suurta suosiota kyselyyn vastanneiden lihantuottajien keskuudessa.

Tarjottu vaihtoehto osuuskunnan osake jäljitteli jäsenkunnan ulkopuolisen sijoittajan roolia, sillä siihen ei kuulunut äänioikeutta osuuskunnassa, mutta pörssiosakkeiden tapaan se oli luovutettavissa eteenpäin ja sille oli määriteltävissä markkina-arvo. Näiden uudenlaisten sijoitusinstrumenttien kaihtaminen kyselytutkimuksessa voi johtua siitä,

että niitä ei ole vielä otettu käyttöön missään suomalaisessa tuottajaosuuskunnassa, vaikka uusi osuuskuntalaki mahdollistaisi niiden käytön.

### ***Vallan säilyminen tuottajilla koettiin tärkeäksi***

Sijoituksen tuoma päätösvalta oli kyselyn tulosten perusteella tärkeää tuottajille. Sijoitusvaihtoehto, jossa jäsen ostaisi osuuskunnalta sen omistamia pörssiosakkeita ja johon liittyi tavallista osaketta suurempi äänivalta lihanjalostusta harjoittavassa osakeyhtiössä, sai enemmän kannatusta kuin tavallinen osakeomistus yrityksessä. Erityisesti tuottajat, jotka olivat vastikään laajentaneet tuotantoaan, suosivat äänivaltaisia osakkeita.

Vastaajat kokivat myös pääoman arvonnousun mahdollisuuden erittäin tärkeäksi. Toisaalta pääomatappioiden välttämistä pidettiin vielä tärkeämpänä, mikä selittää perinteisen osuuspääoman muotoisen sijoituksen nousemista suosituimmaksi vaihtoehdoksi.

Kyselyssä haluttiin lisäksi selvittää, riippuuko viljelijöiden sijoitushalukkuus yrityksen taloudellisesta tilanteesta. Tätä varten sijoitushalukkuutta kysyttiin kahden erilaisen tilannekuvauksen jälkeen, ja vastaajien ilmoittamia sijoitussummia ja vaihtoehtojen kiinnostavuutta verrattiin skenaarioiden välillä keskenään. Viljelijöiden sitoutuminen osuuskunnan rahoittamiseen oli heikompaa tilanteessa, jossa yrityksen kuvattiin tarvitsevan jäsenrahoitusta pelastuakseen kassakriisiltä, kuin verrattuna tilanteeseen, jossa jäsenrahoitus käytettäisiin kilpailukykyä parantaviin investointeihin. Kriisiskenaariossa vastaajien raportoimat sijoitussummat olivat lähes puolet pienempiä kuin positiivisessa skenaariossa.

### ***Tulosten hyödyntäminen***

Tutkimuksen tulokset korostavat jäsenten näkemysten huomioonottamista osuuskuntayrityksen strategisessa suunnittelussa ja kilpailukyyn kehittämistyössä. Jäsenrahoituksen riittämättömyys voi johtaa tarpeeseen hankkia ulkopuolista rahoitusta, jolloin viljelijöiden päätösvalta heikkenee. Kuitenkin jos yrityksen tulevaisuus on uhattuna, ulkopuolisten omistajien mukaantulon salliminen voi olla viljelijöidenkin etu, vaikka he joutuisivat luovuttamaan äänioikeuksia pääomapanoksen vastineeksi.

Tutkimuksen perusteella voidaan tehdä useita johtopäätöksiä viljelijöiden sijoitushalukkuudesta osuuskuntayrityksiin. Moni tuottajaosuuskunnan jäsen kokee saavansa hyötyä sijoituksesta, jossa varallisuus on kiinni kahdessa kerroksessa yritystä: sekä suoraan osuuskuntaan tehdyssä osuuspääomasijoituksessa että välillisesti osuuskunnan kautta omistuksena jalostusta harjoittavassa osakeyhtiössä. Tämän

sijoitusvaihtoehdon saatua kannatusta kyselyyn vastanneiden keskuudessa suomalaisten lihaosuuskuntien yhtiörakenteen voidaan päätellä olevan jäsenten näkökulmasta optimaalinen. Tulosta tulkittaessa ja uusia rahoitusinstrumentteja kehitettäessä on kuitenkin hyvä pitää mielessä tutkimuskirjallisuudessa laajalti raportoitu ihmisten taipumus suosia tuttuja vaihtoehtoja.

Jäsenkunnan epäyhtenäisyyden takia osuuskunnan on tärkeää tarjota erilaisia vaihtoehtoja, joista jäsenet voivat löytää itselleen sopivan tavan halutessaan osallistua yrityksen rahoittamiseen. Osa jäsenistä saattaa suosia sijoituksia, joihin liittyy äänivaltaa, kun taas toisille sijoituksen jälkimarkkinakelpoisuus on toivottavaa.

### ***Tutkimuksen taustalla tarve kehittää kasvun rahoittamisen keinoja***

Maatalouden tuottajien omistamat yritykset kohtaavat kovenevaa kilpailua kansainvälisillä ruoka- ja maatalousmarkkinoilla. Kuluttajien kasvaneet laatuvaatimukset ulottuvat koko ruokaketjun läpi tilalle asti, ja ne vaikuttavat investointitarpeisiin prosessien mukauttamiseksi vastaamaan vaatimuksia. Osuuskuntamuotoisen yrityksen rahoituksen hankintamahdollisuudet ovat rajallisemmat kuin osakeyhtiöiden. Sen on todettu kansainvälisesti useissa tapauksissa asettavan osuuskunnat epäedulliseen kilpailuasetelmaan ja voivan vähentää osuuskunnan pääomainvestointeja. Maatalousmarkkinoiden muutos ja tilojen muuttuva rakenne asettavat lisähaasteita tuottajaosuuskuntien jäsenpohjaiselle rahoitukselle. Ääritapauksessa pääoman puute voi johtaa osuuskunnan vararikkoon.

Vastauksena kilpailupaineisiin monissa maissa on kehitetty uusia osuuskuntien rakenteita, jotka väljentävät omistajaoikeuksia ja sallivat ulkopuolisten sijoittajien mukaantulon. Kasvupääoman hankkiminen osuuskunnan jäsenistön ulkopuolisilta sijoittajilta on koettu ratkaisevan tärkeäksi, ja se on saanut luopumaan perinteisestä osuuskuntarakenteesta. Tuottajataustaiset yritykset pyrkivät tyypillisesti löytämään yritysrakenteen, joka säilyttää osuuskunnan ideologian mutta mahdollistaa ulkopuolisen rahoituksen hankinnan. Jos osuuskuntien eri muotoja ajatellaan jatkumona, toisessa ääripäässä on yrityksen muuttaminen sijoittajien omistamaksi osakeyhtiöksi, joka on täysin erkaantunut osuuskuntaperiaatteista (osuuskunnan asiakas omistaa, hyötyy ja käyttää päätäntävaltaa).

### ***Tutkimusaineistona kahden suomalaisen lihaosuuskunnan jäsenet***

Kyselytutkimuksen aineisto muodostui kahden suomalaisen lihantuottajaosuuskunnan (LSO ja Itikka) jäsenistä. Lihamarkkinat ovat käyneet läpi suuria rakenteellisia muutoksia. Eurooppalaiset sianlihan markkinat ovat yhtenäiset ja markkinavetoiset niin tuotannossa kuin teollisuudessa. Markkinoiden tiivistymisen myötä lihasektorilla

toimivat osuuskunnat ovat kokeneet ns. hybridisaation, millä tarkoitetaan sijoittajalähtöisempien yhtiörakenteiden omaksumista ja integroitumista jatkojalostuksen arvoketjussa.

Osana tätä kehityskulkua kahden suuren suomalaisen lihaosuuskunnan rooli on muuttunut toissijaisesti osuuskunnaksi, koska niiden päätehtävänä on hallinnoida omistustaan pörssilistatuissa lihatuotteiden jalostusta ja markkinointia harjoittavissa yhtiöissä (HKScan Oyj ja Atria Oyj).

Tällaisissa holdingyhtiö-osuuskuntarakenteissa tuottajien osuuskuntaan tekemä pääomapanos tuottaa heille sekä suoraa että välillistä omistusta kahdelle yhtiörakenteen tasolle. Ensinnäkin jäsenet tekevät osuuskuntaan pääomasijoituksen, joka määräytyy heidän tuotantovolyyminsa mukaan. Tämä jäsenosuuspääoma on suora sijoitus, joka suo viljelijälle ääni- ja tuotto-oikeudet osuuskunnassa. Sen lisäksi osuuskunnan merkittävän pörssiomistuksen myötä viljelijöiden varallisuutta on kiinni myös ruokaketjun seuraavalla tasolla jalostuksesta vastaavassa yrityksessä.

### ***Kyselyssä testattiin nyt hypoteettisia mutta lain mahdollistamia sijoitusmuotoja***

Tutkimus toteutettiin kyselylomakkeella, jolla selvitettiin sijoitusvaihtoehtojen suosituimmuutta. Lomakkeella esitettiin erimuotoisia sijoituksia, jotka kohdistuivat osuuskuntayrityksen eri tasoille ja tuottivat toisistaan poikkeavia omistus- ja valtaoikeuksia. Vaihtoehdot kuvasivat lisäksi mahdollisuutta arvonnousuun ja sijoituksen jälkimarkkinakelpoisuutta. Vastaajia pyydettiin ensin pisteyttämään annetut vaihtoehdot suosituimmuusjärjestyksessä ja sitten ilmaisemaan rahamäärä, jonka olisi valmis sijoittamaan kuhunkin vaihtoehtoon. Kyselyaineisto kerättiin postikyselyllä, johon vastasi 276 lihantuottajaa.

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# 1 INTRODUCTION

Agricultural producer organizations are under increasing competitive pressure in globalized food and agricultural markets. The quality requirements of downstream customers are also felt at the farm and in agricultural firms in the form of investment needs to adapt processes. The possibilities of cooperatives to acquire equity capital are more restricted in comparison to corporations. This imposes a financial handicap on cooperatives in competition by holding back capital investments (Chaddad *et al.*, 2005). For agricultural producer organizations, further challenges arise from the industrialisation of agriculture. A lack of capital may lead to the failure of the cooperative (Fulton and Hueth, 2009).

Innovative structures that relax some of the restrictions on the residual claims of agricultural cooperatives have emerged as response to the competitive pressures (Chaddad and Cook, 2004). Gaining access to growth capital from investors has in many cases been a decisive factor in departing from the traditional cooperative organizational structure (Chaddad and Iliopoulos, 2013).

The objective of producer organizations is typically to find a model that retains the cooperative form and ideology but enables access to non-member equity capital (van Bekkum and Bijman, 2006). At the other extreme in the cooperative typology of Chaddad and Cook (2004) is the transformation into an investor-owned firm (IOF), which detaches the producer organization from its cooperative principles (the user owns, benefits from and controls the firm).

This study focused on the members of two large Finnish meat producer cooperatives. This agricultural sector has undergone major structural changes. In Europe, the pig meat market is highly integrated and intensely market-oriented, both in production and in the processing industry (Pyykkönen *et al.*, 2012). The consolidation process in the meat industry has led to the hybridization of producer cooperatives, i.e. the cooperatives have moved towards IOF structures when integrating along the value chain. As an outcome of this process, the two largest Finnish meat producer cooperatives (*LSO* and *Itikka*) have become secondary cooperatives whose main role is to manage the ownership in stock-listed companies (*HKScan plc* and *Atria plc*) that are responsible for downstream business activities such as the processing and marketing of meat products.

In these cooperative structures, the producers have both direct and indirect ownership. Their capital contribution and control extend to two layers of the agricultural producer organization. First, the producers have to contribute to the cooperative capital an amount that is determined in proportion to their business volume. This constitutes the member capital. This direct investment in the cooperative endows the farmers with

control and residual rights in the producer cooperative, i.e. the first leg of the food supply chain. In addition, as the producer cooperative has a significant ownership stake in the stock exchange listed company, the farmers also have a financial interest tied to this processing and marketing layer of the food supply chain.

This division of farmers' wealth at different levels of food production has implications for the financing of the company, particularly for the form in which members are willing to participate with new capital. An agricultural cooperative may not be the preferred place to commit the capital if producers perceive that they gain higher utility from any other form of investment. There is a gap in the existing literature on cooperative transformations, as the preferences of farmers for the financing mechanisms are not thoroughly understood.

The main question addressed in this paper is whether farmers, as members and owners of producer cooperatives, are willing to invest in cooperative growth. Due to the changing membership as a result of the industrialisation of agriculture, we are interested in which farmer characteristics contribute to the willingness to invest. A questionnaire employing a contingent rating task was used to examine the preferences regarding the form of investment. Subjects were presented with investment alternatives that represent different stages in the hybrid cooperative chain. The alternatives varied in terms of ownership and control rights. In addition, attributes defining return possibilities and the transferability of the investment were included. The method for eliciting preferences was two-staged: farmers first assigned a rating for each of the investments, which was then followed by the task of allocating a chosen investment sum to each.

The data of this study originated from a mail survey among the members of two meat producer cooperatives, and the final sample included 1928 meat producers. The survey approach enabled testing of the within-subjects effects with two scenario treatments. In the first scenario, investment preferences were elicited after stating that the company was collecting capital for an investment that could improve the competitiveness and profitability of the company. This framed a positive investment scenario. In the second scenario, the company was described as being financially strained and the producers' capital contribution was stated as critical to restoring the competitiveness of the company.

The rest of the paper is structured as follows. Section 2 discusses the key literature regarding the emergence of innovative organizational structures from the foundations of traditional agricultural producer cooperatives. Section 3 presents the study design, including an elaboration of the investment alternatives, and the survey data and methods. Results regarding who invests, the preferred investment form and farmer commitment are presented in Section 4, after which Section 5 concludes.



## 2 LITERATURE

The rationale for producers to organize in agricultural cooperatives is to gain market entry, to strengthen the farmers' bargaining power, to bring information advantages, and to capture economies of scale (Hendrikse and Bijman, 2002; Valentinov, 2007). Cooperatives have traditionally emerged to provide a mechanism to substitute for market failures or depressed prices (Cook, 1995). By organizing market access through a cooperative, farmers are able to benefit from lower transaction costs than they would face by independently bargaining with buyers. Transaction costs are affected by uncertainty and the frequency of transactions, as well as asset specificity (Williamson 1989; Ménard, 2004).

Producer cooperatives play an important role in present-day agribusiness in the food supply chain of all EU member states (Bijman *et al.*, 2012). Despite the persistence of cooperatives as a predominant organizational form in agriculture, the traditional model of agricultural cooperatives is being challenged. Organizational innovations reflect the structural change in agriculture (Chaddad and Cook, 2004; Valentinov, 2007). The concept of home markets for cooperatives has broadened in parallel with the globalization of agriculture. Markets for agricultural products have become more liberalized (Hendrikse and Bijman, 2002). The internal dynamics of agricultural cooperatives places additional pressures on their financial position. The diminishing number of agricultural producers means that cooperatives need to refund the capital of leaving members at a faster rate than new capital flows in. Since capital intensity on modern farms is high, producers may prefer to invest in their own production rather than investing in the cooperative.

According to the theory of firm ownership, an organizational form emerges that minimizes the transaction costs (Hansmann, 1988). In this framework, ownership costs explain why ownership rights are assigned to particular patrons. The emergence of non-traditional organizational models of farmer-owner cooperatives is a result of minimizing of the costs of ownership. The property rights theory constitutes a supplementary framework in addition to the transaction cost hypothesis in explaining the diversity of cooperative models.

From the property rights perspective, the emergence of new innovative cooperative organizational forms reflects the need to improve incentives for member-patrons. Traditional cooperative models suffer from organizational limitations such as vaguely defined property rights, illiquid ownership rights, and conflicting residual rights between active and inactive members (Staatz, 1987; Cook and Iliopoulos, 1999, 2000). Improperly defined property rights produce low incentives to participate in the control of the cooperative and invest in it (Vitaliano, 1983). Several studies have pointed to the

institutional disadvantages characterizing cooperatives that give rise to incentive problems (Vitaliano, 1983; Cook, 1995; Cook and Iliopoulos, 1999; Sykuta and Cook, 2001, Valentinov, 2007). The free-rider problem, or common property problem, arises when gains accrue among individuals who have not participated in the efforts that produced the gains. In cooperatives, the problem is pronounced between the current members and new members (Sykuta and Cook, 2001). The potential for such intergenerational conflict exists when the cooperative shares are untradeable and the residual rights are equal (Cook, 1995).

Horizon problems arise when the lifespan of investments is longer than the members' horizon (Vitaliano, 1983). Returns accrue later, while the members expect higher current payments. The return right of a member terminates when the farmer exits and stops patronizing the cooperative. The horizon problem is exacerbated by the equity structure, which lacks tradable shares, and the lack of appreciation mechanisms for member capital. This can result in a general tendency to favour short-term investments and hampers organizational growth. The portfolio problem refers to the member's investment risk being tied to the organization's investment portfolio. The member's ability to make portfolio decisions according to subjective risk preferences is restricted, because the cooperative investment is tied to the patronage decisions (Cook, 1995).

Transformations in the ownership right structures of agricultural cooperatives have resulted in a rich variety of cooperative models. Chaddad and Cook (2004) described them in a typology of five non-traditional cooperative models between the polar opposites of the traditional cooperative and the investor-oriented firm. These models, which may be adopted by user-owned organizations to ameliorate financial constraints, differ in terms of the residual rights of control and residual claims. The starting point for the typology is the traditional cooperative structure, which Chaddad and Cook (2004) characterized in terms of ownership rights restricted to member-patrons, non-transferable, nonappreciable and redeemable residual rights, and benefit distribution in proportion to patronage. By relaxing the restrictions of the traditional cooperative one by one – proportionality, benefit basis, redeemability and transferability – and by opening to non-member investments, the typology arrives at the five innovative cooperative forms.

Cook and Iliopoulos (2000) provided empirical evidence on how the investment incentives of member-patrons depend on the property rights structure. Utilizing the variation in the property rights adopted in a sample of US agricultural cooperatives, they demonstrated that the incentives for members to invest are enhanced when the cooperative equity shares are transferable and appreciable. These attributes offer solutions to the horizon and free-rider problems, as the members can benefit from the long-term payoffs of the cooperative investments. Furthermore, the portfolio problem is

also ameliorated by transferability and the potential for capital appreciation, since the members are better able to choose the level of risk (Cook and Iliopoulos, 2000).

While the rationale for new cooperative models is to overcome financial constraints and to facilitate organizational growth, cooperative expansion may have the reverse effects on farmers' willingness to invest. Reduced member investments in vertical integration could be observed (Nilsson *et al.*, 2009). A potential threat in the emergence of new structures in agricultural organizations is that producers find themselves in large and complex grown cooperative chains and do not understand the operations, and thus become dissatisfied with their cooperative (Nilsson *et al.*, 2009). This erodes their involvement. Shrinking involvement in large cooperatives results in an insufficient availability of investment capital from members, and leads to the solution of inviting outside investors. Fulton and Hueth (2009) further address the question of whether the decision to convert a cooperative to investor ownership promotes the economic interests of the members.

Expectations of how control and residual returns are allocated may be very diverse among member-patrons with different characteristics. Österberg and Nilsson (2009) noted that financing cooperatives with the large unallocated capital of members may weaken the incentives of the members to participate in governance and lead to them avoid investing in the cooperative. Moving from the traditional cooperative model towards the IOF in the cooperative typology, ownership becomes more individualized. More investor-oriented structures may appeal to younger farmers, as they are found to be more economically minded than older farmers, who value the cooperative ideology of fairness and solidarity (Hakelius, 1999). Furthermore, young farmers place less emphasis on member control and community involvement than older members (Richards *et al.*, 1998; Fulton and Adamowicz, 1993). However, the property rights structures that allow for capital appreciation and transferability are hypothesized to be particularly suited to older members. The investment disincentive of members who are close to retirement is reduced by enabling the transferability of cooperative stock in a secondary market (Cook and Iliopoulos, 2000).

Empirical evidence indicates that a farmer's dependence on the cooperative increases in relation to the size of the total assets (Pascucci *et al.*, 2012). The finding suggests that commitment to cooperative delivery may strengthen among those farmers who make large investments in their own farm production. Cooperative members whose income is largely dependent on farming are in fact found to expect a focus on the return on equity from the cooperative managers (Richards *et al.*, 1998). Kalogeras *et al.* (2009) also emphasized the impact of business size on preference heterogeneity regarding governance and financial structure, but the size effect is multidimensional. Small-sized producers can also benefit from non-traditional organizational structures and

individualized equity opportunities. Kyriakopoulos *et al.* (2004) concluded that individualized ownership in the cooperative could stimulate larger investments in product-oriented activities.

Cooperative structures that accommodate the entrance of outside investors simultaneously respond to the heterogeneous preferences inside the cooperative. Some member-patrons may emphasize the capital-related benefits of ownership, while for others the patronage benefits dominate. Reconciling these heterogeneous interests may require the designing of a wide range of ownership agreements. The prior literature drawing on property rights theory gives some predictions of the member characteristics that potentially affect the investment incentives, but gaining a precise understanding of member preferences ultimately remains an empirical question.

### 3 METHODOLOGY

The present research utilised a questionnaire survey conducted among Finnish meat farmers to assess the willingness of the patron-owners to invest capital in the agricultural cooperative chain. This section presents the experimental study design, the data and the methodology used to address the research questions of the farmers' willingness to invest and their commitment to the firm.

#### 3.1 Study design

The study was conducted as a questionnaire survey, in which the producers were requested to compare four given investment alternatives. The alternatives differed in terms of ownership and control rights, as well as return possibilities and transferability. The alternatives were designed to represent capital contribution to different sequences in the chain of organizations of the hybrid cooperative. The objective of the design was to determine the investment preferences of the patron-owners and to identify which type of investment instrument would enable the cooperative organization chain to collect capital from the members if it needed additional equity capital.

The Finnish meat producer cooperatives have transformed into holding companies in which the farmers are the owners and members, but they deliver production to a separate subsidiary corporation. The businesses of processing and marketing further downstream are incorporated in a stock-listed company. As a consequence, the sample of meat producers of the two large Finnish meat cooperatives represented so-called *hybrid cooperative* structures, or alternatively *IOF-like cooperatives*. Van Bekkum and Bijman (2006) categorized them as *hybrid listed cooperatives* (HLC), which corresponds to the *investor-share model* in Chaddad and Cook (2004) typology.

The role of the cooperatives is to act as holding companies for the stock-listed company. The dual-class share structure enables the producers to retain control by holding the decision majority through the extra vote-carrying shares, the control stock. Outside investors participate with the ordinary share class. Decision rights are also allocated to the holders of ordinary shares on the basis of one share one vote, whereas the vote-carrying shares entitle holders to multiple votes per share. In the current ownership structure, all the stockholders have a residual right to income. For the cooperatives, the dividends constitute the main revenue source, which is used to remunerate the cooperative members with interest paid on their cooperative capital contribution. On the other hand, ownership rights in the cooperative are currently allocated exclusively to the members. To become a member, patronage is required. This corresponds to the traditional cooperative organizational form in the typology of Chaddad and Cook

(2004), while its function is far from traditional, i.e. only holding, due to the hybrid structure.

The investment alternatives are presented in *Figure 1*. Some of the choice situations are currently hypothetical, but the producers may in the future encounter them in real life. The investment alternatives of this study were designed in the framework of Chaddad and Cook (2004), but the elements of the typology were applied to the Finnish environment and the current context, which is familiar to the meat producers. Alternatives 1 and 4 are currently available, as described above, in the forms of the traditional cooperative capital and the IOF stock investment. Alternatives 2 and 3 are currently hypothetical, as they combine the elements of a traditional cooperative and an IOF in terms of how ownership rights are defined. *Figure 2* maps the given investment alternatives to the variation in cooperative model typology.

The first, and the nearest in the chain to the producers, is the alternative to invest in the cooperative under the same conditions as the producers contribute cooperative capital based on their membership obligation. While obligatory capital defines the minimum capital contribution and is determined in relation to patronage, the offered investment alternative represents a contribution on top of the capital obligation. The current practice in the Finnish meat producer cooperatives is to determine the return on obligatory capital after the accounting year and pay it once a year. For the accounting year 2013, the largest Finnish meat producer cooperatives LSO and Itikka paid 5% and 12% interest on capital, respectively. The typical redemption policy regarding the obligatory capital is that the capital is redeemed with a one-year lag after the end of the resignation year. To resign and request capital redemption, a member only needs to submit a notice of resignation to the cooperative board.

In the second alternative, the producers are again offered the possibility to make an investment in the cooperative, but on such terms that correspond to the capital claim of non-member investors. In this alternative, the investment does not give voting rights. In addition, the investment can be transferred and there is a potential for capital gains or losses.

Two other investment alternatives describe direct shareholding in the stock exchange-listed subsidiary company that is positioned further up the vertical food supply chain and takes care of processing and marketing. By direct, we mean that the members of the hybrid cooperative already have indirect ownership in the stock-listed company via the ownership chain, but the producers can also freely invest in the stocks of the company. Thus, the third investment alternative gives producers an option to invest in vote-carrying shares. The rationale for this design is that it enables producers to retain control, although the block-ownership of the cooperative is dismantled, for example due

to the financing constraints of the cooperative. The fourth investment alternative corresponds to the ordinary stock investment and is thus made on the same terms, as any investor in the market can trade in the stocks of the food processing company.

Alternative	Description in questionnaire
1.	Investment in <b>cooperative</b> capital. The return is equivalent to the return on the obligatory capital. The investment is redeemable at the nominal value.
2.	Investment in non-voting <b>cooperative</b> capital. The value of the capital may appreciate or depreciate, and the investment is freely transferable.
3.	Investment in vote-carrying shares in the <b>stock-listed company</b> . The cooperative sells its stockholding to the producers. The shares are traded on the stock exchange, where the value of the capital may appreciate or depreciate, and the investment is freely transferable.
4.	Investment in the new stock issue of the <b>stock-listed company</b> . The shares are traded on the stock exchange, where the value of the capital may appreciate or depreciate, and the investment is freely transferable.

*Figure 1. Investment alternatives presented in the choice task questionnaire.*

The choice task included two elements. The questionnaire presented the alternatives as they appear in Figure 1 and briefly explained the vertically integrated organizational structure of the hybrid agricultural cooperatives. Thereafter, the respondents were requested to rate each alternative using a 5-point Likert scale, with 5 indicating the most preferred and 1 the least preferred choice. In addition, a follow-up question elicited the amounts in euros that the respondents were willing to invest in each instrument.

The rationale for the two-staged questionnaire design was that the rating task forced the respondents to evaluate the attractiveness and compare the alternatives. However, although an alternative may be preferable, a farmer may not want to invest in it for any reason. Thus, the rating task was followed by the sum task, in which zero investment was a possible response. The task allowed the formation of preference ranking in the farmer sample and estimation of the availability of member capital.

Investment alternative	Ownership rights and the position of the producer	Status	Counterpart in typology
1. Traditional cooperative	Investment defines the same residual and control rights as the member's position as a patron.	In use	Traditional cooperative
2. Investment cooperative	The member assumes the role of an investor with a capital interest but no additional control.	Hypothetical	Investor-share cooperative
3. Control stock	The member takes over the ownership rights from the holding cooperative, i.e. indirect stock ownership is dissolved.	Hypothetical	Investor-oriented firm
4. Ordinary stock	Corresponds to outside investors.	In use	Investor-oriented firm

**Figure 2. Mapping of the choice situations to the Chaddad and Cook (2004) typology of cooperative models.**

Although the cooperatives that constituted the sample of this study currently have a solid financial position, their financing strategies may be reviewed if any link in the vertical chain needs to acquire investment capital. The role of member financing is particularly relevant in the transition to the new cooperative law in Finland (in effect from January 2014). Although the Finnish cooperative law allows innovations in member capital instruments, the alternatives are not yet utilized in practice.

The choice tasks were preceded by a briefing that the company for which the hybrid cooperative is a holding company had decided to expand its operations. Investment would allow significant improvements in competitiveness and profitability. For the patron-owners, this implied a potential to benefit from a higher producer price and interest on capital. The investment situation was, therefore, described as a positive scenario.

The questionnaire design enabled the study of differences in the willingness to invest when capital is acquired for profitable growth or in order to evade bankruptcy. To test the commitment of members in bad times, the questionnaire described another decision frame in which the member capital was called for to save the company from a cash crisis. The scenario described a tight competitive situation in the food market that had put the revenues and solvency of the company under severe pressure. The financial strains were described as endangering the ability of the cooperative to deliver patron benefits. Subsequently, the same rating and investment sum choice task was presented as in the



positive scenario. Framing of the investment situations in a positive and negative light in effect constitutes a within-subject treatment experiment.

### **3.2 Farmer data**

The study was conducted as a mail questionnaire. The sample consisted of the members of the two largest meat producer cooperatives in Finland. The member lists and the contact information were received confidentially from the cooperatives. The questionnaire was delivered by mail in February 2014. In addition to the paper questionnaire format, the respondents were given the option to complete the same questionnaire online. The response rate turned out rather low, 14.3%, with only 276 completed questionnaires being received.

Several reasons for the low participation rate can be identified. First, the member registers that constituted the basis for the survey sample included some farmers who may not be active in meat production. Despite cross-checking efforts against dairy producer data, it is possible that not all dairy cow producers were filtered out. On the other hand, some cooperative members had already exited farming. Further loss in the participation rate could be attributed to general survey fatigue, which was voiced in the open feedback. Finally, among the farmers in meat production, which is a sector under considerable profitability pressures, the survey topic of making additional investments may not have been received with high response motivation. The possibility of biases in the research results due to sample selection cannot be ruled out, but it is impossible to know the direction of the potential bias. Those members who participated in the survey may have been equally divided into pro-investment and anti-investment individuals.

*Table 1* summarizes the data. The farmer characteristics of the meat producers are presented for the pig, cattle and poultry production sectors, which were the main groups in the sample. In addition to the measures of farm size (field area, herd size and production volume), the questionnaire elicited information on the farmers' intention to enlarge production or exit farming within the next five years. Dummy variables (1 = yes, 0 = no) were constructed from the responses, and similarly if the farmer had expanded production within the previous five-year period. The Shapiro-Wilk normality test for small samples indicated that only age was normally distributed.

Comparison of the summary statistics with the national farmer statistics corroborates the representativeness of the sample (Natural Resources Institute of Finland, 2014). The average age is 50.6 years among all Finnish farmers and 48 years among meat producers. The average farm size is 84 hectares for beef production farms (excluding forest land), 94 hectares in pig husbandry and 91 hectares in poultry husbandry. The proportion of female farmers was 11% in the latest publication of the national farm register and farm

structure in 2011. The average herd size in pig husbandry was 1,340 in 2014. In beef production, the herd size is approximately 40 when statistics on slaughter cattle are used. The production volume of a pig farm was 210,000 kg on average, and that of a beef production farm 27,000 kg per year. The respondents engaged in poultry husbandry were, however, much larger producers in comparison to the national average of 260,000 kg per year. Overall, these findings suggest that the low response rate did not severely distort the sample or impair the validity of the research results.

**Table 1. Descriptive statistics of the respondents, mean and standard deviation (in parentheses)**

Variable	Pig N = 77	Cattle N = 138	Poultry N = 26
Farmer age	50 (10.4)	49 (10.6)	50 (8.7)
Field area, ha	99 (67.6)	72 (61.7)	84 (47.2)
Cooperative capital, euro	30,480 (43,860)	7,265 (13,394)	44,400 (48,525)
Herd size	1241 (2826)	37 (71.2)	- -
Production volume, kg/year	262,400	30,500	573,000
Female, %	13	15	8
Have expanded, %	17	27	38
Intention to expand, %	11	22	38
Intention to exit, %	16	13	0
Region South, N	44	57	0
Region West, N	27	58	17

*Kruskal-Wallis test for differences in capital and field area between pig, cattle and poultry subsamples is significant at the level  $p < 0.01$ . Pigs are only reported for farms specializing in piglets, and in cattle for farms that breed calves. The sample includes also 35 farmers who specialize in some other line of production or it is unknown. The postal codes of farms were mapped to NUTS 2 regions, which form the basis for indicators of South, West and Northeast Finland.*

Differences in the background variables between the subsamples were tested under the null hypothesis that the distribution of a variable is the same across production sectors. As the sample was divided into three production categories, the Kruskal-Wallis test

indicates that all the other background variables differed between the production sectors except for age. Differences between herd size and production kilograms were not tested due to differences in farm structure, because the variables were by definition different depending on the livestock. Herd size was not available for poultry. The pig and cattle subsamples consisted of heterogeneous production. Pig farms can be of three types: pork meat production, raising piglets, or a combination of these.

The farms were categorized as small, medium-sized or large based on the reported production volume. The size classes for the subsectors were determined by the sample averages and percentiles of the respective samples. The chosen classification method resulted in approximately even-sized groups in each subsample. Pig farms were categorised as medium-sized when the reported production volume fell in the range of 120,000–250,000 kilograms. Volumes below this classified a pig farm as small, while volumes above it classified the farm as large. Poultry farms whose production volume was in the range of 400,000–650,000 kilograms were classified as medium-sized, below the lower limit as small and above the upper limit as large. The data on cattle farms may also include some members of the meat cooperatives whose primary production sector is milk, although milk producers were screened out whenever information on the production type was available. Cattle farms fell into the medium-sized category if the production volume was in the range of 10,000–28,000 kilograms.

### **3.3 Empirical methods**

Contingent rating is a hypothetical method in which the subjects are asked to make choices based on a given hypothetical scenario. Ratings indicate both the order and degree of preference (Hensher, 1994). The method is suitable for studying preferences regarding product characteristics, i.e. here about the investment instruments. The rating method does not force subjects to make trade-offs between the alternatives, as the respondents may state the same score for two or more alternatives.

Contingent rating is frequently used in transport and marketing studies and in environmental evaluation tasks (e.g. Roe *et al.*, 1996). The method is based on an assumption that subjects are able to state their evaluation in terms of ratings. In the choice modelling literature, the ratings data are typically analysed by decomposing the alternatives into different attributes and explaining the rating using an ordinary least squares regression (OLS) with the attributes. In this study, however, we were interested in farmers' preferences for investment alternatives as a non-separable combination of characteristics and less in the preferences regarding the different attributes as such (e.g. voting rights).

The approach was appropriate in the context of this research, because we defined the ‘products’ as a combination of attributes and we were interested in the preferences of individuals for the whole package rather than for specific attributes. The rating task did not force the respondents to artificially rank order alternatives, i.e. an individual could express equal preferences for several alternatives. By aggregating over individual preferences, the method allows the analyst to derive the overall preference structure among the respondents and to derive the policy implications regarding the design of new investment instruments. Applying the rating method in this rather practical manner was justified, as the aim of this research was not to arrive at willingness to pay values for certain attributes. Thus, the failure of the contingent rating method to produce estimates consistent with utility theory is not of concern here. While the evaluation of the given investment alternatives may be cognitively demanding for the respondents due to the new elements relative to their current real-life choice set, we aimed to minimize the burden by keeping the response task as simple as possible.

Stating preferences as ratings does not require respondents to choose a particular alternative or condition the respondents to investing any money in the given investment instruments. A common criticism of the approach is that the model cannot be used to predict choice behaviour or the demand for the individual alternatives (Adamowicz *et al.*, 1998). Therefore, the choice task was here accompanied by an investment sum evaluation task. Stating the willingness to invest in euros forces the respondent to evaluate the subjective value of each investment. A systematic observation in studies on financial decision making is that people have a tendency to overstate their valuations in contingent surveys (Landry and List, 2007) and that such data suffer from the hypothetical bias. Therefore, this study employed contingent rating in the first stage of the choice task and gave a possibility to report zero investment sums.

The respondents in this study repeated the choice task several times, i.e. they evaluated and assigned rating scores to a number of investment alternatives. Therefore, the study design corresponded to a repeated choice approach. Repeated measures designs are frequently used in social sciences in analysing variation within individuals observed several times. We were interested in determining the relationship between farmer characteristics and investment preferences. For this purpose, we employed a multivariate linear model with repeated measures. In contrast to settings where the method is frequently used, here the repetition came from the exposure of respondents to several alternatives instead of the time effects in longitudinal data.

The basic idea of a repeated measures model is that an outcome of interest  $r$  is observed  $n$  times. These are the dependent variables. They are related to  $c$  covariates, i.e. independent variables. The linear relation of  $y_i$ , the vector of dependent variables, where  $i = 1, \dots, r$ , to the covariates  $x_j$ , where  $j = 1, \dots, c$ , is defined as

$$y_i = \beta_0 + \beta_{1i}x_1 + \dots + \beta_{ci}x_c + e_i \quad (1)$$

where  $e_i$  is the error term and  $\beta_{0i}, \dots, \beta_{ci}$  are the estimated regression coefficients on the covariates.

In the repeated measures analysis of this research, a farmer was repeatedly measured four times, i.e. in four conditions representing four investment alternatives. The analysis enabled the parallel estimation of four dependent variables per farmer (within-subject variation) and explanation of the stated choice with farmer-specific variables (between-subject variation). The repeated measures approach was required because the participants' choices in different conditions were correlated. The Pearson correlation coefficient was 0.53 between ratings for alternatives 1 and 2, and 0.61 between those for alternatives 3 and 4. The lowest correlation coefficient was observed between the extreme end alternatives, but was still significant at 0.35. The correlation coefficients for the investment sums were even higher.

A common problem with dependent variables constructed from questionnaire responses is their ordinal type rather than being continuous scale variables. Ordered probit or logit regression models would take into account the variable restriction by upper and lower bounds if the Likert scale ratings were transformed to the binary variable of investing vs. not investing, and this would avoid the assumption of a monotonic scale of the rating variable (Hensher, 1994). Dichotomous transformation, however, loses information inherent in the rating responses. An individual may not be sure which of the adjacent ratings to assign to an alternative, and if we then made an arbitrary threshold under which the response indicated not investing, we would not be able to capture the degree of preference variation between the alternatives. Hence, in this data set, we considered retention of the rating variable to be a more feasible estimation strategy than pursuing the highest modelling efficiency but losing information.

To analyse farmer commitment, the willingness to invest was compared between the positive base scenario and the negative crisis scenario using the Wilcoxon test. This test is appropriate for comparing the responses of the same participants in two treatments, which was here the repeated choice task in two scenarios and formed another within-subject design.

## 4 RESULTS

Here, the reporting of the survey findings begins by looking into who is willing to invest, after which we examine the stated preferences regarding the form of the investments. The analysis of farmer commitment sheds light on investment decisions in good versus bad times.

### 4.1 Who invests?

Overall, the meat producers appeared to be positively disposed to the opportunity to make additional investment in the cooperative organization chain. Almost three-quarters of the respondents were willing to invest in any of the investment alternatives. *Table 2* shows that in total, 198 farmers reported non-zero investment sums among the total sample of 276 respondents.

On average, the cattle and poultry farmers were slightly more likely to invest than the pig farmers, of whom 71% reported non-zero investment sums. Chi-square tests in the second column of the table were conducted on one characteristic at a time to test the difference in investment decisions among a particular group of respondents versus the other respondents. The share of cattle farmers who were willing to invest, 76%, was statistically significantly higher than the share of farmers in other production sectors. The highest share of investment was recorded among the poultry farmers.

**Table 2. Farmer characteristics and the decision to invest in the cooperative organization.**

Characteristics	% of respondents		N	Average sum, euros	
	Investing	Chi-squared <sup>1</sup>		Invest in coop <sup>2</sup>	Invest in stock <sup>2</sup>
All farmers	72	-	198	8,179	8,425
Pig farmers	71	0.01	55	13,045	8,975
Cattle	76	2.82*	106	5,723	4,701
Poultry	79	0.72	22	10,977	9,091
Small farms	77	0.46	59	6,297	4,336
Medium sized	75	0.80	49	5,705	5,199
Large farms	89	4.05**	47	15,055	9,088
Expanded	84	5.81**	52	13,059	11,533
Will expand	81	2.86*	43	11,794	7,806
Will exit	67	0.63	28	5,013	3,398
Female	70	0.05	26	2,867	2,642
West	74	0.52	83	9,766	5,880
South	77	4.14**	90	4,672	3,919
Northeast	78	0.36	17	11,404	8,524

1) Test of the difference in investing and non-investing decisions between the farmers with the stated characteristic and the others. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

2) 'Invest in coop' is an average of the reported sums for alternatives 1 and 2, and 'invest in stock' is an average of the reported sums for alternatives 3 and 4.

The reported investment sums were allocated almost evenly between the given cooperative investment alternatives and the alternatives in which the investment was directly made in the stock-listed company. According to the results, farmers were prepared to invest on average some 8,000 euros if they were willing to invest at all. The stock investments slightly dominated over the alternatives of investing in the cooperative. An intriguing finding is that the pig farmers reported on average 5,000 euros higher investment sums in the cooperative than the sample average. The result suggests that despite being slightly less likely to invest, those pig farmers who are willing to invest report on average higher investment sums than the cattle and poultry farmers. One could argue that the low response rate in the survey produced upward biases in the elicited investment sums if only highly motivated members responded. It is notable, however, that almost 30% of the respondents participated by reporting no willingness to invest at all (i.e. zero sums). The proportion of zero responses was rather stable across background characteristic groups. Thus, the sums may not have been severely inflated. More importantly, the relative preferences between the given investment alternatives are as important as the sums, and there is no reason to suspect the preference of non-respondents to systematically differ from those of the respondents.

The economic significance of the survey results becomes clear when the elicited investment sums are compared with the actual data on the economic position of the producers. The estimated value of cooperative capital per member was some 13,000 euros in the two meat producer cooperatives. Against this fact, a capital contribution of more than 8,000 euros to the cooperative represents a very large additional stake for an individual member.

Furthermore, the investment sums are also significant in comparison to the average family farm income of about 18,000 euros (source: MTT Profitability bookkeeping statistics 2013). The profitability varies considerably depending on the sector, as the average family farm income of cattle farms was 29,000 euros, but only 14,300 euros for pig farms, while the income of 24,300 euros in the poultry sector falls between. The national average farm capital of pig, poultry and cattle farms is 670,000 euros, 440,000 euros and 380,000 euros, respectively. In relation to these farm capital figures, the average sums reported for cooperative investment alternatives represent about 2% of the capital for all three production sectors.

A higher propensity to invest was observed among large farms in comparison to small or medium-sized farms. The share of large farms reporting willingness to invest was 89%, and the difference was statistically significant. The size effect carried over to investment sums, as the highest investment sums were elicited from the large farms, both in the cooperative and in the stock alternatives. One possible explanation is that among the members whose farm production is large, their already high capital stake contribution breeds a sense of ownership in the cooperative organization chain, and additional investments are perceived as inherent in their own farm business.

According to an alternative hypothesis on size effects, the large farms are likely to be capital-constrained by their own farm investments, and smaller farms should thus exhibit a higher propensity to invest. One can interpret as evidence against the capital-constraint hypothesis the finding that the proportion willing to invest was higher among those farmers who reported having expanded production in the preceding five-year period, or who had an intention to expand their production in the near future.

Unsurprisingly, the farmers whose plan regarding meat production was to exit, i.e. close or sell the farm, within next five years were the least willing to make additional investments in the cooperative organization chain. The share of investing among the exiting farmers was, however, as high as 67%. The investment sums were on average significantly lower than those reported by the continuing producers. Similarly to other farmers, the exiting farmers preferred the cooperative investment alternatives over stocks.



Willingness to invest varied according to the farm location. Farmers in Southern Finland were somewhat more likely to invest than meat producers in the other regions. The reported investment sums were, however, higher in the small sample of farmers in the Northeast region and in West Finland, where agriculture, and meat production in particular, are important for employment and the regional economy (Niemi and Ahlstedt, 2013).

## 4.2 Preferred investment form

Investments in the cooperative emerged as the preferred form among meat producers. We used several measures to identify the preferences: the primary measure was the rating that the farmers reported in the first stage of the choice task, and the additional measures described the distributions of investment sums both on average among the farmers and as total sums over all respondents.

*Table 3* indicates that farmers rated the traditional cooperative capital form most highly among the four given alternatives. One half of the respondents assigned a rating of 4 or 5 on the Likert scale to that alternative. In addition, the number of respondents who reported a non-zero investment sum was 176, which was a higher share of farmers than for the three other alternatives. The median investment sum was 5,000 euros when a farmer decided to make the investment in the traditional cooperative capital form, and 3,000 euros in all the other forms. There was, however, quite large variation in the sums reported by the farmers, as the mean investment sums were significantly higher than the median sums. Several respondents were willing to invest tens of thousands of euros, and even up to one hundred thousand. The average sum assigned to the traditional cooperative capital investment was 12,700 euros.

***Table 3. Ratings and sums for the investment alternatives in the base scenario.***

	Base scenario profitable growth					
	Rating		N non-zero	Investment sum		
	Mean	Rank <sup>1</sup>		Mean	Median	Total
Traditional coop	3.65	1	176	12,714	5,000	2,237,700
Investment coop	2.67	4	130	7,701	3,000	1,001,100
Control stock	2.96	2	135	9,700	3,000	1,309,500
Ordinary stock	2.92	3	149	7,562	3,000	1,126,700
N	276					

*1) The ranking is based on the total rating score over 276 respondents.*

Despite the strong preference for investment in the cooperative, the other offered cooperative alternative appeared to be the least preferred investment form according to both the ratings and the investment sums. Less than half of the farmers assigned a non-zero investment sum to the alternative in which capital is contributed to the cooperative on investor terms instead of member terms, i.e. the investment does not give voting rights and the capital is freely transferable. The value of investment may appreciate or depreciate. The most frequently assigned rating for this alternative was either 3 or 2, which indicates that the cooperative members had a reserved judgement about this type of investor role in their own cooperative.

The questionnaire included a set of control questions that were intended to describe the respondents' investment decision criteria in general and what the critical factors were when members considered increasing their capital contribution to the cooperative above the production-based obligation. The meat cooperatives included in this study have historically paid generous interest returns on capital, as the ten-year average interest rate is approximately 13%. It is not surprising that more than 80% of the respondents agreed that the competitive return made cooperative capital an attractive investment in comparison to any other investments (unreported findings). Only two per cent of the farmers stated that the competitive return was not an important factor in their decision.

One could argue that cooperative capital has offered a sort of arbitrage return to the members. The risk of losing the capital is low because the capital is redeemed at the full nominal value. Theoretically, of course, there is a risk of cooperative failure, in which case the member capital would absorb losses. In these particular cooperatives, the risk is not acute, since their financial position is exceptionally good. It is worth noting that a few years ago, one large Finnish meat producer cooperative was dissolved and the cooperative shares lost value, which is engraved in the collective memory of all farmers, not only its former members who lost capital. This is likely to have been reflected in the questionnaire responses in that the fact that capital is returned is rated even higher by the farmers than the interest return.

Somewhat paradoxically, the farmers viewed the potential for capital appreciation to be as important a factor as the protection of the capital value. In the investment alternative of traditional cooperative capital, the capital cannot appreciate or depreciate in value. However, while the second alternative of cooperative investment offers the potential for appreciation, the respondents did not prefer that form. The investment was rather made further up the organizational chain in the stocks of the marketing and processing company. Of the stock investment alternatives, control stock was preferred over normal stock. Recall that alternative 3 was defined so that the cooperative sells to farmers the stock that it holds in the subsidiary. The rating of alternative 3 as the second preferred

indicates that the members were willing to retain control of the processing chain with the producers should the cooperative decide to decrease its ownership stake.

In unreported findings, responses to additional control questions confirmed the observation that farmers preferred financial instruments that retain their voting rights and ensure that the voice of producers is heard in governance. After the choice tasks, the questionnaire enquired about the reasons for a respondent preferring the traditional cooperative capital form. The importance of retaining control was clearly the most frequently mentioned reason, but the farmers did not categorically restrict ownership rights to the members. Farmers expressed aversion to losing capital as another important motivation for preferring the traditional cooperative investment form on terms that secure the redemption at the nominal value. The familiarity of the first alternative did not appear very influential in determining the choices.

### **4.3 Explaining preferences with farmer characteristics**

To further understand the relationship between investment preferences and farmer characteristics, we ran a repeated measures multivariate regression model that is suitable for analysing correlated choices. The model had four dependent variables, which were the ratings of alternatives 1 to 4. Between-subject variation was examined with explanatory variables that were chosen for the model based on the most significant differences observed between the farmer groups in the willingness to invest (earlier in *Table 2*). *Table 4* reports the estimated coefficients for ratings of investment alternatives.

**Table 4. Repeated measures multivariate model of investment preference ratings.**

Variable	(1) Traditional coop	(2) Investment coop	(3) Control stock	(4) Ordinary stock
Intercept	3.02*** (0.22)	2.1*** (0.17)	2.31*** (0.18)	2.40*** (0.18)
Cattle	0.001 (0.17)	0.11 (0.13)	0.03 (0.14)	-0.08 (0.14)
Large	-0.16 (0.21)	0.39** (0.16)	0.04 (0.17)	0.41** (0.18)
Field area	-0.004 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.03** (0.01)
Region South	0.04 (0.17)	0.02 (0.13)	0.13 (0.14)	0.21 (0.15)
Exit	-0.14 (0.26)	-0.16 (0.21)	-0.53** (0.22)	-0.01 (0.23)
Expanded	0.06 (0.23)	-0.28 (0.18)	0.45** (0.19)	-0.11 (0.19)
Will expand	0.24 (0.23)	-0.02 (0.18)	-0.06 (0.19)	0.27 (0.20)
Treatment	0.36** (0.17)	0.39*** (0.13)	0.40*** (0.14)	0.39*** (0.14)
N observations	392	392	392	392
R squared	0.02	0.04	0.06	0.05
Levene's test	1.94	0.06	0.17	0.19
Box's test	19.66			
Sig.	0.04**			

\*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ . Standard errors are in parentheses.

The columns show the estimated coefficients for the four dependent variables. The independent variables are dummies, except for the field area, which is measured in tens of hectares. The indicator variable Treatment takes a value of one for the base scenario of positive growth prospects, and its regression coefficient measures the difference in the ratings, i.e. the treatment effect indicating higher ratings as response to the positive framing of the capital collection situation. The intercept indicates the average rating for an alternative. In the positive base scenario, the treatment effect of about 0.4 points is added to the average. The finding is intuitive as it suggests that the farmers are more willing to contribute capital to the cooperative, when the prospects of investment are positive compared to a situation in which capital is needed to evade a cash crisis. The

regression coefficients on the farmer characteristics show how much a particular characteristic contributes to the rating, i.e. the deviation from the mean.

The model fit suffers from the fact that the dependent variables lack a normal distribution. In addition, the set of explanatory variables is inarguably a simplified effort towards capturing farmer heterogeneity. Unobserved factors appear to explain the choices more than we are able to capture with the elicited background characteristics. For example, farm profitability and current investment position are probably important decision factors, but the data are limited. Moreover, pooling of different production sectors into the same model is likely to introduce some confounding effects on the estimates, but due to the small sample size, the strategy of modelling the choices over the whole data is justified.

In addition to analysing the effect of a background variable on a particular choice, the repeated measures setting enables the differences between the choices to be identified. It is apparent from *Table 4* that large farms strongly prefer alternatives 2 and 4. In contrast, the coefficient of the dummy variable Large has a negative sign in the first model for alternative 1, although the effect is not statistically significant. Another interesting finding is how the future intentions concerning meat production are related to the investment preferences. Coefficients on the dummy variable Exit indicate that exiting farmers are not interested in control stocks, while those farmers who have recently expanded their production exhibit a strong preference for control stocks over the other investment alternatives. Overall, the exiting farmers give lower ratings to all investment alternatives, which is indicated by the negative coefficients.

*Table 5* reports a similar analysis with the allocated investment sums as dependent variables. The sums enter the model after natural logarithmic transformation. The size effect is now even more prominent in sums than in the ratings. Large farm owners are on average likely to report higher investment sums for all alternatives, but alternatives 2 and 4 are clearly preferred. The stock investment is also preferred by the farmers located in Southern Finland.

**Table 5. Repeated measures multivariate model of investment sums.**

Variable	(1) Traditional coop	(2) Investment coop	(3) Control stock	(4) Ordinary stock
Intercept	4.89*** (0.53)	2.62*** (0.53)	2.84*** (0.52)	3.42*** (0.51)
Cattle	-0.31 (0.42)	-0.07 (0.42)	0.43 (0.41)	-0.03 (0.41)
Large	1.11** (0.52)	1.59*** (0.51)	1.25** (0.51)	1.78*** (0.50)
Field area	-0.02 (0.04)	-0.03 (0.04)	-0.05 (0.03)	-0.10*** (0.03)
Region South	-0.18 (0.42)	0.45 (0.42)	0.57 (0.41)	1.01** (0.41)
Exit	-0.03 (0.65)	0.26 (0.65)	-1.37** (0.64)	-0.78 (0.63)
Expanded	-0.04 (0.60)	-0.11 (0.55)	1.39** (0.55)	0.05 (0.54)
Will expand	1.34** (0.57)	0.70 (0.57)	0.17 (0.56)	1.05* (0.55)
Treatment	0.85** (0.41)	1.08*** (0.40)	1.03** (0.40)	1.29*** (0.40)
N observations	392	392	392	392
R squared	0.05	0.05	0.09	0.09
Levene's test	0.27	7.21***	0.34	0.21
Box's test	31.67			
Sig.	0.001***			

\*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ . Standard errors are in parentheses.

The model includes field area as another size measure, because in our data the field hectares and production kilograms were not highly correlated. We assumed that farms with a large field area may practice arable production alongside meat production, and the field area variable therefore captures a different size effect compared to the volume-based dummy for large farms. Those farmers who have a larger field area are less interested in the investments, and the effect is statistically significant in model four with the normal stock. A possible explanation is that income from crop cultivation makes a farmer less committed to the meat cooperative, which reduces the farmer's willingness to invest.

The analysis of investment sums further explains the differences in preferences that we observed with respect to farming plans. Larger investment sums are available from those farmers who intend to expand their production volume. We interpret this as an indicator of willingness to support the value chain to which the farm's own production goes as input. This may reflect either reliance of the expanding farm on the business relationship with the hybrid cooperative or the expectation of a better economic return on farm investment when the competitiveness of the firm is scaled up.

Earlier, we observed that many farmers who had recently expanded made the decision to invest in the cooperative organization chain. The coefficients of the multivariate model on the dummy variable Expanded suggest, however, that these farmers were willing to contribute somewhat smaller sums to the cooperative compared to other farmers, although the effects were not statistically significant except for alternative 3, which had a large positive coefficient. Expanded farmers preferred control stock carrying extra voting rights.

The overall fit of the estimated repeated measures models may be suspect when the Box's M test statistic has a significant value. This suggests that some of the model assumptions may not hold. The assumption of normality of the dependent variables is the core of the linear model, but the model is more sensitive to unequal variances. The nonsignificant test statistics of Levene's tests for all the dependent variables, except for the euro sums of alternative 2, confirm that the homogeneity of variance assumption is not violated and the model is appropriate.

#### **4.4 Patience and member commitment**

The responses to the tasks framed in the negative scenario formed the basis for analysing farmer commitment. In the cooperative literature, member commitment is generally defined in terms of a more multifaceted relationship with capital than participation. Fulton (1999) defined member commitment as simply the preference for patronizing the cooperative, even when an IOF provides a better price or service. The precondition for the existence of cooperatives according to Fulton (1999) is that members perceive long-term benefits from cooperatives and farmers have an incentive to invest in them. While cooperative ideology may be losing its importance as a 'glue' keeping members committed (Nilsson *et al.*, 2012; Fulton, 1999), the relationship of farmers with the cooperative is becoming more business and economics related. Cechin *et al.* (2013) described commitment as an action towards the organization that involves action readiness. Because a shortage of capital may lead to the demise of the cooperative (Fulton and Hueth, 2009), we postulate that willingness to invest and to keep the firm afloat is a manifestation of an even stronger commitment than if described by the

patronage relationship. If members are patient during bad times, the capital base of the firm will be supported, which will contribute to the long-term benefits for members.

To test the patience of member capital during a crisis situation, investment preferences elicited in the negative scenario were compared with the baseline scenario. Preference ratings were hypothesized to remain unchanged between the scenarios. The farmers' decision mechanism was not known *ex ante*, and neither was how highly the farmers appreciated certain investment attributes in times of crisis. *Table 6* reports the ratings and investment sums assigned to the investment alternatives in the scenario describing a need for capital to save the company from a cash crisis. The results imply that the willingness to invest wanes compared with the positive situation.

Fewer farmers were willing to contribute capital in any form. The median sums were 3,000 euros in the traditional cooperative capital alternative and 2,000 euros in the other three alternatives. The average ratings were all below the mid-point three, except for the traditional cooperative investment alternative, which remained the most preferred. This indicates that the farmers did not perceive the offered investments as very attractive in this scenario, and the participation of members in financing the organization chain was limited. The preference order remained almost the same, but ordinary stock received a slightly higher preference rating than the control stock.

***Table 6. Ratings and sums for the investment alternatives in the negative scenario.***

	Negative scenario cash crisis					
	Rating		N non-zero	Investment sum		
	Mean	Rank <sup>1</sup>		Mean	Median	Total
Traditional coop	3.34	1	155	8,586	3,000	1,330,800
Investment coop	2.34	4	101	5,605	2,000	566,100
Control stock	2.58	3	111	8,796	2,000	976,300
Ordinary stock	2.61	2	117	5,813	2,000	680,100
N	276					

*1) The ranking is based on the total rating score over 276 respondents.*

Farmer commitment to the cooperative organization chain was tested with the Wilcoxon test for paired samples. This test is suitable for the statistical testing of within-subject differences. The questionnaire design, which framed two investment scenarios, bears resemblance to before-after treatment studies, in which the participants perform two conditions and Wilcoxon is frequently used to test the difference. Here, we compared pairwise the ratings and investment sums between the positive and negative scenario.



Table 7 reports the results of the paired-samples Wilcoxon tests on ratings and sums. The differences between the scenarios were statistically significant in all within-subject pairwise comparisons. Many farmers retained the same rating in the negative scenario as they report in the baseline growth scenario. However, a substantial number of respondents marked down the rating, and all the investment alternatives were less attractive in a cash crisis. Similarly, the reported investment sums were statistically significantly lower.

The method cannot, however, distinguish factors leading to the preference migrations, i.e. whether there are any systematic relationships between the farmer characteristics and the changes in preference order contingent on the organization's financial situation. Investigating the attractiveness of different investment attributes depending on the future outlook is left for future studies.

**Table 7. Test of the within-subject effect of the investment scenario treatment.**

Alternative <sup>1</sup>	Ratings			Investment sums		
	Total N <sup>2</sup>	Ties	Standardized test statistic	Total N	Ties	Standardized test statistic
Traditional coop	232	114	-3.76***	276	150	-5.76***
Investment coop	232	114	-4.77***	276	190	-5.33***
Control stock	230	105	-4.98***	276	179	-5.15***
Ordinary stock	233	109	-4.29***	276	170	-5.97***

1) Wilcoxon test of paired samples between responses to positive and negatives scenarios for ratings and investment sums. \*\*\*  $p < 0.01$  denotes significance of the test statistic on the null hypothesis that the median difference between the questionnaire treatments is zero.

2) The number of ratings is lower than the sample size, because empty responses were omitted. However, empty responses to investment sums were coded as zeros.

## 5 CONCLUSION

Despite the growing body of papers discussing the emerging heterogeneity in agricultural producer organization structures, there is a gap in the literature in that the preferences of farmers are not fully understood. Farmers have many alternative forms to participate with new investment capital in IOF-like cooperatives. This paper provides new evidence on the member investment preferences among a sample of meat producers in so-called hybrid cooperatives, which are representatives of the European-wide consolidation and hybridisation process in the sector.

Results from the contingent rating tasks of the questionnaire study revealed that the majority of farmers were willing to invest in the cooperative organization chain. The tendency increased as a function of farm size, as we observed that farmers categorised as large assigned non-zero investment sums slightly more often than small or medium-sized producers. If the investment is measured in relative rather than absolute terms, the size effect is likely to be marginally decreasing, because the capital obligation is also related to size by patronage. Producers who intend to exit farming were found to be less willing to provide growth capital to the hybrid organization, and this result applies to both the cooperative and the stock exchange-listed parts. The average investment sum in the sample was some 8,000 euros.

The investment alternatives presented in the questionnaire differed in terms of ownership and control rights, as well as the opportunity for capital appreciation and the transferability of the capital claim. The alternative describing traditional cooperative capital appeared as the most preferred form. The other alternative that offered the possibility to invest in the cooperative was not as well received among the members of the meat cooperatives. Only farmers categorised as large were positively disposed to the investment cooperative alternative.

The offered investment cooperative alternative simulated the investor role and was exempt of voting rights, offered transferability of the cooperative share, and the existence of some sort of market valuation for the share. The relative aversion to such new investments observed in the ratings data may be attributable to its hypothetical nature. Tradable cooperative shares had not been issued in Finnish producer cooperatives at the time of the study, although the new cooperative law has enabled their use.

Retaining control appears important to producers. The alternative that offered to producers the opportunity to buy vote-carrying shares in the stock exchange-listed company operating in the downstream business was preferred over the new issue of normal stock. Control stock was observed to be even more attractive to the farmers who had recently expanded their production volumes. The respondents stated that they also

found the possibility of capital appreciation very important. On the other hand, the avoidance of capital losses was reported to be even more important, which may explain the relative attractiveness of the traditional cooperative capital form. Comparing the scenario treatment effects, we observed that farmer commitment erodes when the firm is in financial difficulties. Less member capital is available to save the firm from a cash crisis compared to a scenario of investments to improve competitiveness. The investment sums available from cooperative members in total were almost halved in comparison to the positive investment scenario.

The results of this paper highlight the importance of strategic planning in order to maintain the competitiveness of the firm. A shortage of member capital may lead to the need to invite outside investors to finance the producer organization, and consequently to the dilution of farmer control. However, if the future of the company is under threat, it may be in the interest of farmers to allow outsiders to gain voting power in compensation for their capital contribution.

The managerial implications of the research findings specifically regarding farmers' investments in hybrid cooperatives are threefold. First of all, a significant number of members appear to derive value from the two-layer investment structure in which their direct capital contribution is made in the cooperative, and which entitles them to an indirect holding in the processing IOF. If stock investment alternatives dominated, one could argue that the current holding cooperative structure that is in use in Finnish meat cooperatives and also emerging elsewhere would not be optimal in allocating member capital. A clear conclusion from the findings of this research relates to the marketing of financial instruments. Preference for the familiar needs to be understood when cooperatives decide to introduce new features in capital instruments offered to their members.

Finally, given the growing heterogeneity among cooperative members, it is important to retain variety in capital participation mechanisms. Some members may prefer investment alternatives that increase their control rights, while for others the marketability of investment is essential. Further research is needed to understand the preferences of both the producers and the investors regarding the specific investment attributes so that financing mechanisms that meet the expectations of both groups can be designed.

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