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Post-merger performance of agro-food cooperatives in the Netherlands

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This master thesis is the final product of six months research in the context of the master Management, Economics and Consumers studies at the Wageningen University. During my master I became more interested in the field of agricultural cooperatives. For this reason I selected agricultural cooperatives, and especially the post-merger performance of merging cooperatives, as the main topic of my thesis.

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Abstract

The Netherlands has a rich cooperative history, and since the late 18th century cooperatives play a major role in the agro-food sector. Due to the ongoing scale enlargement and capital constraints cooperatives face, through the years, an increasing number of mergers occurred. The question is if these cooperative mergers lead to an increase of financial performance. Previous studies, which mainly focused on the United States, do not provide hard evidence for an increase in financial performance of the agro-food cooperatives. Since other studies present contrasting conclusions about the financial performance of cooperative mergers, and no research is done on the Dutch cooperative case, this study focusses on the post-merger performance of Dutch agro-food cooperatives. After a literature review, identifying the main reasons for cooperatives to merge, an empirical analysis was performed, using a database of Dutch agro-food cooperatives over a period of 20 years. Following a descriptive analysis of the performance of merged and unmerged cooperatives, a regression analysis was performed, to assess whether merged cooperatives performed better than unmerged ones. The metrics to measure performance were: return on assets, profit margin, sales, net result, sales per member and net result per member. The results indicate that mergers are useful to gain cooperative growth in terms of sales or members, however we find that mergers, on average, do not result in an increase of profit margin or ROA. Following the results of this study, Dutch agro-food cooperatives may not pursue mergers if their objective is to increase profit margin or ROA, although, mergers should be used if increasing sales is the main goal.

Key words: Cooperatives, Agro-food, Netherlands, Financial performance, mergers, pre-merger, post-merger.

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1. Introduction

1.1 Background

Since the Late 1800s, cooperatives played a major role in the Dutch agricultural supply chain (M. Fulton & Giannakas, 2013). A good example is the dairy sector, where in the Netherlands (as well as other countries, such as Denmark) 80% of the domestic dairy production is processed by one cooperative, in the case of the Netherlands, FrieslandCampina (Meliá, Juliá, & Martínez, 2010; ZuivelNL, 2013). In the Netherlands, most cooperatives can be found in the agro-food and financial sectors. There are several differences between cooperatives and Investor Owned Firms (IOFs), one of these is the ownership structure. A cooperative is a dual-nature company or, in other words, a user-owned company, where owners are also the patrons of the cooperative (Draheim, 1955; Nillesen, 2000). IOFs are owned by investors, instead of user-owners, and the aim is to make profit by investing in the company. Another difference is the tradability of stocks, since cooperatives' stocks are, as opposed to IOFs stocks, not marketable. Furthermore, there is no financial speculation possible with cooperative stocks, making investing in a cooperative not attractive to external investors (Lerman & Parliament, 1993). There can be several reasons to start a cooperative, mainly to generate improvements in the financial structure and to gain bargaining power over suppliers or buyers. Maximizing profit is not the main objective of a cooperative, since it has to serve the goals of its members. (Richards & Manfredo, 2003a). Additional reasons to start a agricultural cooperative are: 1) the need to gain access to industrially produced goods and services; 2) the need to achieve efficiency and economies of scale; 3) the need to manage risk; and 4) the need to improve members' income (Van Dijk, 1997).

Cooperatives represent a unique economic entity, as they are not formed to generate and retain profits, but to create economic benefits for the members and to give them market access (Hoffmann, 2005). Through the years, growth has become more and more important for agro-food cooperatives, because their competitors have grown and have become more efficient (Lerman & Parliament, 1993). A cooperative can achieve growth in two different ways: internal and external (Richards & Manfredo, 2003b). Internal growth means that the company expands its sales by means of the already existing activities. External growth occurs by consolidating/merging with other companies. In this way, the turnover grows and, often, more capital becomes available (Garoian & Cramer, 1968). Growth by merger, in contrast to growth by internal expansion, leads to drastic and quick modification of the firm, market, and industry structure (Garoian & Cramer, 1968). This is a reason why the number of agricultural mergers and acquisitions has grown considerably in the period 1980-2000 (Richards & Manfredo, 2003b; TheFoodinstitute, 2000).

Most academic studies have focused on cooperative mergers in the U.S. case study. The most investigated hypothesis is that mergers can lead to an increase in sales and profitability due to economies of scale and other synergies. Richards and Manfredo (2003b) created a two-step model to analyse the post-merger performance of agricultural cooperatives in the US. In the first step, they determined the impact of capital constraints on the likelihood that cooperatives consolidate. The

second step, they analysed post-merger financial performance. They concluded that capital constraints are important reasons for cooperatives to merge, and that access to more capital in case of merger can allow a company to increase sales, however, in some cases the access to more capital can reduces profitability of a merger.

Ravenscraft and Scherer (1989) found similar results, although not in the context of cooperatives. Ravenscraft and Scherer researched post-merger performance of corporate companies, assessing whether acquired companies were under-performers, and if mergers led to higher profits. There was no broad statistical support found for the first hypothesis. There was no clear evidence for an increase in post-merger profits either, even though, in some cases the increased available capital led to investments, but did not significantly increase profits. Some evidence showed that agricultural cooperatives might decide to merge even when there are evident arguments against the benefits of the merger. Parliament and Taitt (1989) found that even if the outcomes of previous analyses showed that the result of mergers and acquisitions were negative, agricultural cooperatives were still motivated to merge, due to their willingness to grow (Chen, Babb, & Schrader, 1985; Mueller, 1961; Parliament & Taitt, 1989).

The Netherlands has a rich agricultural cooperative history and several cases of mergers and acquisitions. Due mostly to mergers the number of agro-food cooperatives in the Netherlands dropped from 115 in 1998, to 44 in 2002 (Meliá et al., 2010). This pattern makes the agro-food sector in the Netherlands an interesting case study to investigate the post-merger performance of cooperatives. This research tests whether cooperatives in the Netherlands increase their financial performance by means of mergers and acquisitions. This hypothesis is tested by analysing a database encompassing a large number of leading agricultural cooperatives in the Netherlands over a period of 20 years, during which several mergers and acquisitions occurred by means of both descriptive and regression analyses. To the best of my knowledge, no study exists assessing the effect of mergers and acquisitions in cooperatives in the Dutch agro-food sector.

1.2 Objective of the study and research questions

1.2.1 Objective

The objective of this study is to analyse the post-merger performance of agro-food cooperatives in the Netherlands. This research will start with an overview of possible advantages and disadvantages of cooperative mergers. Additionally, an empirical test will be performed to find out whether merged agricultural Dutch cooperatives are more profitable than non-merged ones. In this test the financial data of Dutch cooperatives will be used.

1.2.2 Research questions

The following sub-questions are formulated from the main research question:

1. How do cooperatives differ from IOF's?
2. What are the objectives for cooperatives to merge?
3. What are the possible advantages and disadvantages of mergers and acquisitions of cooperatives?
4. Are there differences in the economic performances of merged and non-merged agricultural cooperatives in the Netherlands?

1.3 Outline

This report will continue as follows. Chapter 2 contains a literature review covering the reasons to start a cooperative, the differences between cooperatives and investor owned firms, and the motivations, advantages and disadvantages of mergers. Chapter 3 describes the data and methodology and chapter 4 presents an illustration of the descriptive and empirical results. In chapter 5 the results will be discussed, including the limitations of this research, conclusions will be drawn and at the end, recommendations for future work are given.

2. Cooperatives versus Investor Owned Firms: A literature review

Cooperatives represent a major part of the economy in most developed market economies, for example in the US, where the agricultural sector is dominated by cooperatives. Cooperatives have a big market share in other industries as well, for example wholesaling, electricity generation and distribution, banking and insurance (Hansmann, 1999). In the Netherlands, cooperatives play a major role in different sectors as well, such as the agro-food sector or financial sector.

2.1 Reasons for cooperation

According to van Dijk (1997) there are five classical reasons for cooperation. Undoubtedly, the need to increase the countervailing power is the most important historical reason why farmers and agro-food producers have set-up cooperatives. The goal of countervailing power is to create a balance in the market power towards other players in the market (Galbraith, 1970). By cooperating, individual farmers increase their market power and are able to influence the market structure, the behaviour of buyers and suppliers (Van Dijk, 1997). The second reason for cooperation is that cooperatives have easier access to industrially produced products and services, and in particular to credit and to lower interest rates. In the Netherlands, the cooperative banks have played, and still play an important role in the development of agricultural firms. Cooperative banks can make interesting offers, due to non-profit strategy and economies of scale. The third reason for cooperation is to achieve efficiency by using economies of scales (Van Dijk, 1997). Due to vertical integration, the transaction costs will decrease, because farmers become a part of both the buying and selling side of the transaction. This leads to lower transaction costs, because it is in their own interest to make a fair deal (Hansmann, 1999). The fourth reason for cooperation is to reduce the business risk of the members. First of all, the competition is reduced because competitive farmers or firms are joining the same cooperative. Also, a cooperative helps to create more continuity in delivery and in achieving higher quality standards for the members, which reduces also the risk of low turnover. The last traditional reason for cooperation is to improve the members' income. The improvement of the members' income can be seen as a result of the four reasons mentioned before. According to Van Dijk (1997) an increase in members' income is the most important reason why individual farmers or firms join a cooperative.

Nowadays, these reasons may not be all applicable anymore. Van Dijk (1997) explained in his work that there is a sixth reason for cooperation, which explains the need for new member strategies as a result of the changed nature of the classical reasons for co-operation. The cooperative has to change into a more efficient company for its members. In van Dijks' paper a couple of examples of the so called 'New Cooperatives Forms' are given. These examples show that traditional cooperatives are changing into different kinds of special cooperatives, mostly to be more flexible and to get easier access to capital (Van Dijk, 1997). In some of these special cooperatives the basic elements of a

cooperative changed; for example, initial screening and selection procedures are nowadays necessary to assess whether potential new members can add something to the cooperative.

2.2 Differences between cooperatives and IOFs

A cooperative is a business which is owned and democratically controlled by the individual businesses which use the services and whose benefits are derived and distributed equitably on the basis of use (Briggeman, 2015). Following Draheim (1955) and van Dijk & Faber, (2000) this is called a dual-nature company, as it is a user-owned company, where the owners are the patrons as well. An IOF is different, as most IOFs release stocks, which can be bought by investors. In this case the investor is the owner of the company, and has a vote in the decision making process as well. Following Briggeman (2015) the 3 main differences are summed up in figure 1.

Co-op	IOF
1. Maximize Member Benefits	1. Maximize Profit or Shareholder Wealth
2. Users can own and control	2. Users typically don't own and control
3. Patronage	3. Dividend

Figure 1. Differences Cooperative and IOFs, Source: Briggeman, 2015

Most people assume that there are more factors where IOFs and cooperatives differ. Hansmann (1999) argues that this is a misleading thought as firms in all kind of industries are typically owned by 'patrons' of the firm, if they are its customers and suppliers, individuals, or other firms. It is clear that this is the case of producer and consumer cooperatives. In case of consumer cooperatives the firm's earnings and often votes, are distributed among the owners/members. This is possible in two ways: votes can be equally divided; or a cooperative can divide the votes following the size of the member firms. A producers' cooperative is mostly owned by a certain group of persons who sell a factor of production to the firm, for example milk, wheat, lumber or labour (Hansmann, 1999). By comparing producer cooperative to an IOF, it can be concluded that an IOF is a special kind of producer cooperative, namely, a 'lenders' cooperative' or a 'capital cooperative'. In fact, an IOF is only different from a cooperative, focussing on the specific factor of production that the owner brings to the firm. In the case of an IOF, the investor brings in only money, in return for ownership and control of the company (Lamprinakis & Fulton, 2011). Within a cooperative, members can adopt four different roles, with specific functions. A cooperative member can be: 1) the customer, to generate profit; 2) the patron, for profit distribution; 3) the owner, to invest in the cooperative; or 4) the controller, to vote for certain decisions.

2.3 Objectives for cooperatives to merge

Companies, in general, have the desire to grow in size. The classic way to grow is by internal growth, expanding the normal business step by step. In the last century external growth became more and more popular, resulting in an increased number of mergers in the agro-food sector (Meliá et al., 2010). In both cooperative firms and IOFs, one of the most important objectives for mergers is growth (Garoian & Cramer, 1968, 1969; Meliá et al., 2010). According to Garoian and Cramer (1969) there are several reasons to grow by merger: 1) to avoid disturbing market pricing patterns; 2) to acquire facilities and markets in a cheaper way then building them; 3) to improve the firm's technical and management personnel and to broaden the financial base; 4) to be more flexible with respect to changing economic pressures; and 5) to get access to new markets or industries with entry barriers.

There are several reasons why agro-food cooperatives decide to merge. Achieving economies of scale and scope is in many cases one of the main goals. By means of economies of scale the unitary production costs should decrease, and therefore , resulting in more profit (Ravenscraft & Scherer, 1989; Richards & Manfredo, 2003a). These economies of scale and scope will be strengthened if the merger leads to synergies (Richards & Manfredo, 2003a). A merger leads in most cases to a bigger market share, which means that the market power of the cooperative increases. At the same time, this means that buyers and suppliers become more dependent on the cooperative, which increases its bargaining power (Garoian & Cramer, 1969; Ravenscraft & Scherer, 1989).

Richards and Manfredo (2003 a; b) stated that the increasing number of mergers may occur for two reasons. In the first place most cooperatives merge due to the capital constraints they face, which slows down their growth. By merging with another company more financial possibilities and investment opportunities facilitating growth are created (Fulton, Fulton, Stephen, & Parliament, 1995). The second reason, as mentioned by Richards and Manfredo are the so-called 'merger-waves' (Golbe & White, 1988; Linn & Zhu, 1997). These authors explained that, at the moment of a merger, the competitors in the same market lose their market position, in case they do not merge. Following a goal of growth to maintain their position more companies, as well as cooperatives, are stimulated to merge. As this phenomenon broadens across industries a 'merger wave' becomes reality.

As mentioned before, there are several reasons for cooperatives to merge. It is possible that cooperatives achieve advantages by merging, which are not expected beforehand, such as a decrease in service costs, higher productivity of the employees, or the displacement of inefficient managers (Ramaswamy & Waegelein, 2003). Ravenscraft (1989) declared that in some cases a cooperative has advantage of economies of scope, for example FrieslandCampina, which is not only a milk processor anymore, but a fruit drink producer as well.

3. Data and methodology

3.1 Data

The dataset used in this research, was created by Roskam (2014). The dataset contains financial information of the largest cooperatives, in terms of turnover, of the Dutch agro-food sector. Roskams' data was collected in association with the Dutch National Cooperative Council (NCR), from the statutes, the consolidated balance sheets, and the consolidated financial statements of the annual reports of the corresponding cooperatives. The data cover a time period of 20 years, from 1993 to 2012. Due to mergers and acquisitions the number of cooperatives in the database has declined heavily, from 40 cooperatives in 1993 to 20 cooperatives in 2012. The dataset contained companies of four different sectors: dairy, horti-business, input supply and other sectors.

The original dataset contains ten variables of interest for financial ratio analysis. These variables are: 1) total assets, 2) total equity capital, 3) Earnings Before Interest and Taxes (EBIT), 4) depreciations, 5) interest expenses, 6) current assets, 7) current liabilities, 8) net results, 9) net sales and 10) total number of members. This study focusses mainly on ROA, sales, assets, net result and number of members.

Table 1 shows the descriptive statistics of the sample. The averages in table 1 are based on the full sample, which include merging and non-merging agro-food cooperatives. Table 1 shows the total number of members was almost constant over 20 years, at around 3500 members, while the sales and total assets increased through the years. This indicates the cooperatives in our sample used scale-enlargement, growing by operating more efficiently. The average equity and debt increased, leading to an increase of total assets.

From the data in Table 1, one can see a drop in net results between 1996 and 1997. This may be due to the dairy cooperative Coberco, merging with Friesland Dairy Foods in 1997. Coberco's performance has a great influence on the average net result of the dataset. The data shows a yearly net result of Coberco is close to €800.000, what is extremely high compared with the other cooperatives. Coberco's business strategy can be an explanation for the high net result, probably the board had knowledge of the merger, and decide to devaluated the company already by increasing net result. After the merger the profit of Friesland FCDF increased, but it was not as high as the sum of profits of the separate cooperatives.

The dataset contains 13 cooperatives which did not merge, despite they expanded their business by means of internal growth. The sequence of mergers is equally divided over the years, as there is no year where more than one merger occurred, which will help to isolate the influence of mergers on the performance variables illustrated above.

In the dataset a distinction can be made between merged and non-merged cooperatives. Only looking at the evolution of the averages of sales, ROA, net result, profit margins, number of members, a clear difference between merged cooperatives and cooperatives that did not merge appears.

Table 1: Sample averages of the main variables by year.

	Members	Total Equity	Total debt	Total assets	Sales	Net results	Profit margin	Return on assets	GDP
1993	3418	€ 53,872	€ 123,056	€ 176,928	€ 409,520	€ 24,628	0.020	0.058	1.3%
1994	3218	€ 51,122	€ 115,501	€ 166,623	€ 403,871	€ 24,750	0.025	0.067	3.0%
1995	3195	€ 54,212	€ 113,037	€ 167,248	€ 410,300	€ 23,752	0.023	0.062	3.1%
1996	3959	€ 74,007	€ 139,002	€ 213,008	€ 496,676	€ 28,905	0.029	0.075	3.1%
1997	4270	€ 85,713	€ 167,547	€ 253,260	€ 582,072	€ 4,800	0.015	0.037	4.0%
1998	4161	€ 84,444	€ 190,072	€ 274,516	€ 579,784	€ 5,767	0.016	0.040	4.4%
1999	3989	€ 86,621	€ 202,959	€ 289,581	€ 607,128	€ 4,658	0.013	0.035	4.5%
2000	3909	€ 93,290	€ 222,045	€ 315,334	€ 689,149	€ 6,218	0.015	0.039	4.4%
2001	3801	€ 106,642	€ 253,535	€ 360,177	€ 732,864	€ 7,032	0.017	0.045	1.6%
2002	3713	€ 110,293	€ 265,349	€ 375,642	€ 776,022	€ 5,094	0.010	0.026	0.0%
2003	3566	€ 112,099	€ 256,209	€ 368,308	€ 771,075	€ 7,621	0.013	0.034	0.3%
2004	3406	€ 120,496	€ 244,597	€ 365,092	€ 761,854	€ 16,596	0.017	0.039	1.9%
2005	3335	€ 123,547	€ 247,659	€ 371,206	€ 759,513	€ 7,336	0.018	0.040	2.3%
2006	3396	€ 133,220	€ 248,033	€ 381,254	€ 790,998	€ 14,652	0.019	0.044	3.8%
2007	3529	€ 159,667	€ 286,679	€ 446,346	€ 917,085	€ 19,008	0.026	0.061	4.2%
2008	3504	€ 156,412	€ 302,933	€ 459,345	€ 998,984	€ 12,905	0.014	0.032	2.1%
2009	3564	€ 182,738	€ 296,356	€ 479,094	€ 1,071,857	€ 17,265	0.019	0.049	-3.3%
2010	3301	€ 214,585	€ 322,669	€ 537,254	€ 1,221,793	€ 24,763	0.019	0.040	1.1%
2011	3503	€ 241,525	€ 358,371	€ 599,896	€ 1,400,373	€ 21,476	0.016	0.034	1.7%
2012	3454	€ 264,314	€ 416,983	€ 681,297	€ 1,542,394	€ 27,987	0.018	0.035	-1.6%

Source: Roskam (2014)

3.2 Empirical Methods

In this research, descriptive analysis as well as regression analysis will be used to assess the differences in financial performance between merged and unmerged cooperatives. The performance measures used are; returns on assets (ROA); profit margins; net results and net results per member; sales and sales per member following Richards and Manfredo (2003b), Garoian and Cramer (1968) and Parliament and Taitt (1989).

Descriptive analysis

The goal of the descriptive analysis is to establish rough differences between merged cooperatives and cooperatives which did not merge by means of graphs. The ROA, profit margin, number of members, sales per member, assets per member and net result per member will be graphically presented.

The sales, assets and net results are divided by the number of members to assess whether there are differences per member between merged and unmerged cooperatives. The expectation is that merged cooperatives have more members and higher sales than cooperatives which are not merged. By dividing by members, the cooperative performance can be identified, without the specific influence of the company-size.

Finally, the total costs and costs per member of cooperative mergers are analysed, to show the change in total costs after a merger takes place. It is expected that merged cooperatives increase more in size than cooperatives that do not merge. Bigger cooperatives have in general higher costs, but higher revenues as well. To get rid of this size implication the total costs per member are generated to see the real differences.

Regression analysis

The goal of the regression analysis is to identify the influence of mergers on the financial performance of agro-food cooperatives. In order to achieve this goal, a regression model is specified, including an indicator variable, capturing cooperatives that merged (value of 1) and those that never merged (value 0), while controlling for other independent variables whose omission could bias the results. By means of regression analysis we test whether mergers have a positive or negative effect on sales, ROA, profit margin, net result, sales per member and net result per member (Garoian & Cramer, 1968).

The single equation model was specified as follows (Schrader, Babb, Boynton, & Lang, 1985):

$$Y = \beta_0 + \beta_1 MA + \beta_2 S_1 + \beta_3 S_2 + \beta_4 S_3 + \beta_5 GDP + \beta_6 M + \beta_7 Se_1 + \beta_8 Se_2 + \beta_9 Se_3 + \beta_{11} TD + \varepsilon$$

Where:

Y is a measure of cooperative performance expressed in different models as:

- Return on Assets; a measure of profit per asset value (Hillier, Ross, Westerfield, Jaffe, & Jordan, 2010).
- Sales (and sales per member); the average revenue from the sales of the cooperatives.
- Profit margin; defined as *net results divided by sales*.
- Net results (and net results per member), defined as the *sales minus all costs*.

β_0 - β_{11} are coefficients to be estimated, measuring the effect of the different independent variables on the dependent variable Y.

MA is a Merger indicator, measures the difference in performance of a pre-merger and post-merger stage. By controlling for independent variables, the influence of mergers can be checked. The variable takes the value 0 in case of pre-merger (or no merger) and 1 in case a cooperative merged.

S_1-S_3 **=** Size groups, defined as the total assets of the cooperative. The three size groups are small (S1), medium (S2) and large (S3): S_1=1 if S *<250,000* S_2=1 if *250,000 < S >1,000,000* and S_3=1 if *S >1,000,000 (Lopez-Gracia & Aybar-Arias, 2000)*.

Gdp **=** Gross domestic product growth, (GDP) measuring overall growth of economic activity in a country. This variable shows the influence of the total economic situation on the dependent variable, in percentage growth (Richards & Manfredo, 2003a).

M **=** Members, defined as total number of members of the cooperative.

***Se_1*-Se_3** **=** Sectors, measures the influence of the 3 different sectors on the average performance of the cooperatives, compared with reference group Se_4, which is excluded from the model, but includes 'other cooperatives'. Se_1 = Dairy sector, Se_2 = Horticulture, Se_3 = Sales and purchase, Se_4 = other.

TD **=** total debt, to identify the role of total debt on the dependent variable. To what extend total debt contributes to an increase or decrease of the dependent variables. Do cooperatives finance their growth with total debt or not?

ε = error term, capturing all influences on the dependent variable which are not explained by the independent variables.

The key explanatory variable in the model is the merger indicator variable. The estimated coefficient associated with this variable will provide an indication of the performance of the merged cooperatives, relative to those which did not merge.

The independent (or control) variables, are chosen either based on other literature or because they can be of interest in this research. The indicator variables capturing size classes were created using total assets as metric of size. However, the size of the company can be explained by different parameters, the most common are sales, assets and employment (Buzby, 1975; Pederson, 1998), each having its pros and cons (Hart & Oulton, 1996). Liebrand (2007) used the extra-value of a cooperative to assess the growth of the cooperative, where the net-savings were calculated as follows: 'net savings - interest (= net result)/ total assets. We follow Liebrand, and focus on the change in net result, based on total assets (Liebrand, 2007). Since sales is one of the main variables of interest, the decision is made to use total assets as metric for cooperative size.

The cooperatives are divided in 3 size groups based on the total assets. Following Lopez-Gracia and Aybar-Arias (2000) the threshold is chosen in a way the cooperatives are quite equally divided. Due to the scale enlargement and mergers, there are more middle and large cooperatives in the last years of the dataset.

Total debt is included in the analysis following Richards and Manfredo (2003a) who used it to identify whether growth is financed by debt or equity capital. In this research it is hypothesized that an increase in total debt should lead to an increase in sales and net result.

The number of members is controlled for since the change in number can result in an increase or decrease of financial performance of individual members. Individual members may be less motivated to perform well, if a cooperative is merging, due to their individual power in the cooperative. This variable is also taken into account, to assess whether individual members leave or join the cooperative in case of mergers.

The different sectors are also used as an independent variable, to control for systematic differences in sectorial cooperative performance. Sector 4, 'other cooperatives' is excluded, which means that the results of sector 1, 2 and 3 are compared with the 'other cooperatives'.

Chow test

In order to assess whether the different independent variables play different roles for merged and non-merged cooperatives, the model was estimated for two subsamples of data: one of the cooperatives that merged and one of cooperatives that never merged. In order to assess whether the split sample models perform better than the model estimated using the full sample, a Chow test was performed. The Chow test provides a test of whether the set of linear regression parameters (i.e., the intercepts and slopes) is equal across groups (Schmidt & Sickles, 1977). The following formula represents the Chow test:

$$F - Value = \frac{Residual\ Pooled - (Residual_1 - Residual_2)/K}{Residual_1 + Residual_2/N_1 + N_2 - 2K}$$

The complete results of the Chow test are in the appendix. The goal of the test is to identify whether there is a structural break in the data. The null hypothesis is $\alpha_1 = \alpha_2$ and $\beta_1 = \beta_2$, defining the estimated coefficients should be the same for both data groups, what shows structural stability. The null hypothesis is rejected, if there are differences in the coefficients, what indicates a structural break in the data. The critical value in case of a 0.05 significance level and with 8 and 527 degrees of freedom is 1.956. The Chow test showed that for all dependent variables the calculated F-values were bigger than the critical value[1], what indicates a structural break in the data. As follows, a split sample regression needs to be done to overcome the possible predicting errors and unreliability of the full sample model, due to this structural break.

Multicollinearity

Multicollinearity will be checked using the Variance Inflation Factor (VIF). Multicollinear variables are correlated, what can cause unreliable results, when attempting to study how well individual independent variables contribute to the understanding of the dependent variable. Excluding collinear variables can be a solution for this problem.

[1] F-values of Chow-test: ROA: 6.922; Profit margin: 7.800; Net results/member: 6.064; Net result: 12.310; Sales/member: 11.260; Sales: 14.903

4. Results

4.1 Descriptive analysis

In figure 2 to figure 7 the ROA, profit margin, number of members, total assets per member, net result per member and sales per member are presented for merged and unmerged cooperatives.

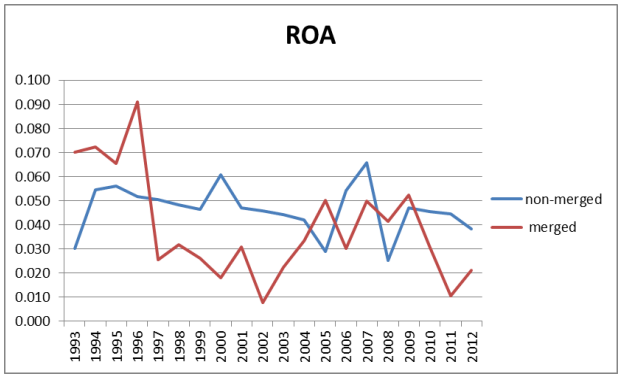

Figure 2: ROA of merged and non-merged cooperatives, years 1992-2012, Authors calculations.

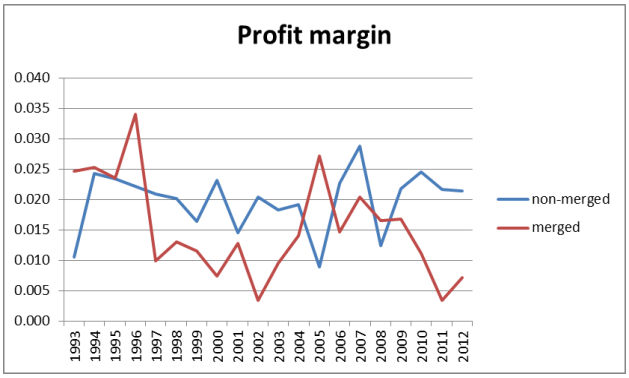

Figure 3: profit margin of merged and non-merged cooperatives; years 1992-2012, Authors calculations.

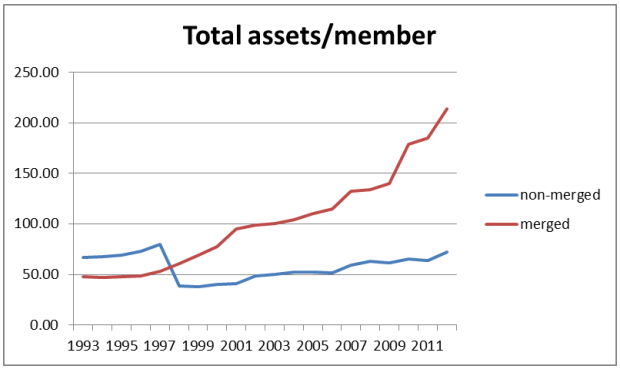

Figure 4: Total assets/member for merged and non-merged cooperatives, years 1992-2012, Authors calculations.

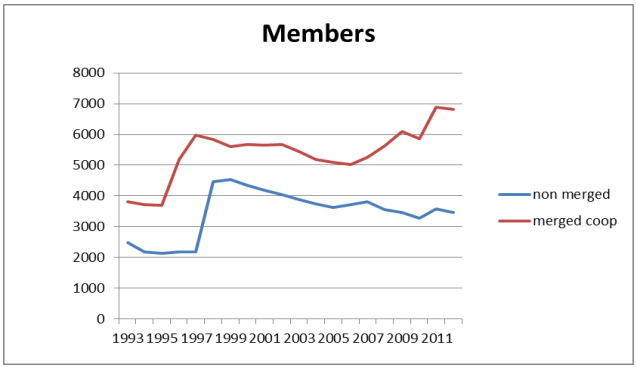

Figure 5: Number of members for merged and non-merged cooperatives, years 1992-2012, Authors calculations.

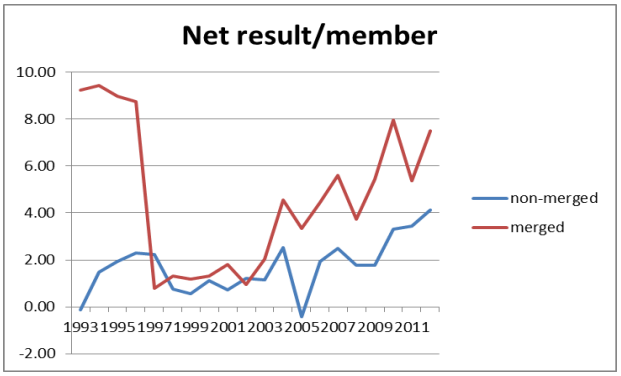

Figure 6: Net result/member of merged and non-merged cooperatives, years 1992-2012, Authors calculations.

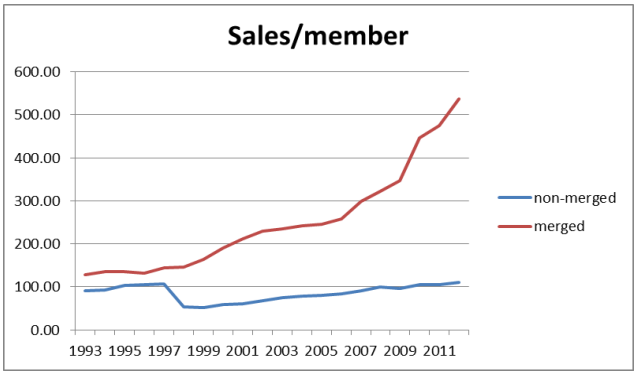

Figure 7: Sales/member of merged and non-merged cooperatives, years 1992-2012, Authors calculations.

The figures above present the averages of merged and unmerged cooperatives. Figures 2 and 3, containing values of ROA and profit margins, show that there is no clear difference in performance between the merged and unmerged cooperatives, the explanation of these patterns are that ROA and profit margin are sensitive for annual influences, which can have effect on the performance of different sectors. The number of members is higher for merged cooperatives than for cooperatives that did not merge. From 2007 a possible move of members, from unmerged cooperatives towards merged cooperatives can be observed. The number of members of cooperatives that never engaged in a merger is declining, while the number of members of merged cooperatives is increasing. The total assets per member increased for merged cooperatives indicating that assets increased faster than the number of members. For cooperatives that do not merge, a growth in assets can be observed as well, this growth is reached by internal expansion. The cooperatives that never merged show a slight increase in net result per member through the years, what indicates a more efficient business, but a decrease in members as well, as presented in figure 5. Figure 6 displays the net result per member, which is declining heavily in the first year of the observed period, due to the merger between Coberco and Friesland foods. From that point onward the average net result per member increased over time. The sales per member are increasing rapidly for merged cooperatives, what indicates a positive correlation between mergers and sales per member. The sales per member of cooperatives that do not merge maintain the same in 1993 as in 2012. This indicates an increase of efficiency for merged cooperatives, even with more members the sales per member increased.

4.2 Regression analysis

4.2.1 ROA and profit margin

The first two rows of table 2 contain the estimated coefficients of the used independent variables on ROA and profit margin. The analysis focusses on the pre-merger and post-merger variables. The regression is done with a 1%, 5% and 10% significance level.

ROA

Given the estimated coefficient for PostM is -0.075 and statistically significant (P-value < 0.01), some evidence is found that cooperatives that merge show, on average a 7,5% lower ROA after the merger. The number of members shows a significant (P-value < 0.1) positive influence of 4.040, so, an increase in number of members is positively correlated with the ROA. The R-squared explains that the independent variables are able to predict 18% of the dependent variable ROA, which is not that high. In other words, the ROA is influenced by some other factors, next to the already used independent variables. It is surprising that the ROA is decreasing, due to the expectation of a synergy, caused by the merger. This indicates that either there is no synergy, or the increase in assets is higher than the increase in net results. In case of a merger, probably not the full capacity of machines and buildings are used, what leads to inefficiencies.

Profit margin

The profit margin is negatively correlated with the postM variable, since the estimated coefficient is -0.029 and statistically significant (P-value < 0.01). On average, cooperatives decrease their profit margin with 2.9% after the merger. Also, an increase in size from small to medium presents a

significant positive correlation with profit margin of 0.023 (p-value <0.01). Due to economies of scale, an increase in performance is expected after a merger occurs, however, in case of the largest Dutch agro-food cooperatives, this increase in performance is not guaranteed. Increased costs are one of the possible reasons that mergers do not have a positive effect on profit margin, examples of this costs are management and personnel costs, but also inefficiencies can occur, such as lack of management and no responsibility is taken anymore. Finally, the dairy sector is performing significantly better (P-value < 0.01) than 'other cooperatives'.[2]

[2] Trails are done with 2nd merger waves, because some cooperatives merged more than once. Different regressions are done, however, no significant differences were found. For this reason the 2nd mergers were left out of the analysis. A VIF test was performed to find out if the used variables were multi-collinear. The mean VIF of all the independent variables used in the model is 2.64, which indicates no multi-collinearity. In case the mean VIF is higher than 10, multi-collinearity could play a role.

Table 2: Estimated parameters showing the influence of independent variables on the dependent variables, including significance level.

	Profit-margin	ROA	Sales	Net result	Sales/ member	Net result/ member
Post M	-0.029*** (0.008)	-0.075*** (0.021)	412285.4*** (72965)	-49274.1*** (12077)	147.351 *** (33.018)	-4.728*** (1.444)
Pre-merge	0.000 (0.001)	-0.001 (0.003)	2415.8 (11334)	-525.35 (1875.8)	-1.582 (5.125)	-0.122 (0.224)
S2	0.023*** (0.007)	0.062*** (0.018)	291129.5*** (65300.0)	23831.3** (10808)	20.369 (25.914)	4.436*** (1.133)
S3	0.000 (0.013)	-0.037 (0.034)	-101290.1 (122299)	-34978.3* (20242)	-182.836 *** (50.099)	-2.054 (2.191)
GDP	-0.033 (0.103)	-0.047 0.274)	-1649377* (975115)	-100540.2 (161394)	-2177.093 *** (438.720)	-20.540 (19.188)
Members	1.360* (0.786)	4.040* (2.080)	0.613 (7.408)	4.164*** (1.226)	---	---
Total debt	-0.007 (0.008)	-0.019 (0.021)	2.535*** (0.076)	0.061*** (0.013)	.0002 *** (.000)	0.001* (0.000)
Sector 1 (Dairy)	0.046*** (0.007)	0.143*** (0.018)	312483.1*** (62475)	45238.0*** (10340.5)	14.12438 (28.287)	9.816*** (1.237)
Sector 2 (Horticulture)	-0.008 (0.007)	-0.007 (0.017)	257156.1*** (61809)	-2438.3 (10230.2)	47.578* (27.983)	-1.524 (1.224)
Sector 3 (Sales and purchase)	0.005 (0.008)	0.021 (0.022)	242581.6*** (78112)	3701.2 (12928.5)	-150.387*** (33.626)	0.286 1.471)
Constant	0.008 (0.005)	0.009 (0.014)	-134316* (50867.5)	-12406.2 (8418.2)	262.761*** (23.0)	2.093** (1.001)
R-squared	*0.1659*	*0.1851*	*0.9012*	*0.2152*	*0.3600*	*0.2197*

Notes: *, **, and *** indicate parameters statistically significant at the 10%, 5% and 1% level, respectively; Standard errors in parenthesis

For *profit margin and sales*; members and total debt are multiplied by 1,000,000

4.2.2 Sales

Sales

The estimated parameter for PostM shows a significant (P<0.01) positive correlation with sales. The coefficient is 412285.4, what indicates after a merger takes place, on average sales increase with 412285.4 euro. The outcome shows a positive relationship between medium size and sales, as well. This indicates if a cooperative increases from small towards medium, on average, sales is likely to increase. The R-squared indicates that 90% of the outcome is predicted by the independent variables used in the analysis, which is quite high. The table shows a significant positive effect (p-value < 0.01) of total debt on sales, with an estimated coefficient of 2.535. This means an increase of debt leads on average to higher sales, probably by investing in advertising or sales agents. The different sector variables have, compared to the 'other' sector, a positive effect on sales.

Sales per member

Given the estimated parameter for sales per member is 147.351, and statistically signifcant (p-value < 0.01), evidence is found that mergers have a positive effect on the sales per member. The positive contribution of total debt to the sales per member (p-value < 0.01) means that cooperatives use debt to increase efficiency. The result of the size influence is not in line with the expectation, which is that larger cooperatives create scale-advantages. The analysis indicates that large cooperatives decrease sales per member compared to medium cooperatives (p-value < 0.01). This negative correlation can be explained by the inefficiencies large cooperatives face. In case of a merger, probably management costs increase, due to the doubled workforce.

4.2.3 Net results

Net result

The net results of agri-food cooperatives are negatively correlated with the PostM variable (P-value < 0.01). The estimated coefficient is -49274.1, what indicates an average decrease of net results of 49274.1 euro. Mergers tend to have, on average, a negative effect on the net results of cooperatives. The results indicate that small and medium size cooperatives are positively correlated with net results, however, large cooperatives are negatively correlated with net results. Large cooperatives probably have increased sales after the merger, but maybe costs increased, on average, more than sales. It is likely that inefficiencies play a role, in this case the cooperative is too big to take advantage of economies of scale. The number of members is positively related with the net results, suggesting that increasing the number of members leads to a more profitable cooperative. The same holds for total debt. The different sectors show some variation in net results. The dairy sector is performing well, while the horticultural sector shows a negative estimated coefficient, both compared with 'other cooperatives'.

Net result /member

The estimated coefficient indicates that mergers have a statistically significant negative influence on the net result per member. The coefficient is -4.728 with a p-value smaller than 0.01, this means that, on average, the net result per member is decreasing by 4.728 euro. Next to this, the estimated parameter shows a positive coefficient of 4.436 for medium size cooperatives, compared with small cooperatives. Increasing towards the medium size cooperative, increases the net result per member, on average with 4.436 euro. Given the estimated coefficient for the dairy sector is 9.816 and statistically significant (P-value <0.01), the dairy sector performs significantly better than the three other sectors and it has, on average, a positive effect on the net result per member.

4.2.4 Total costs

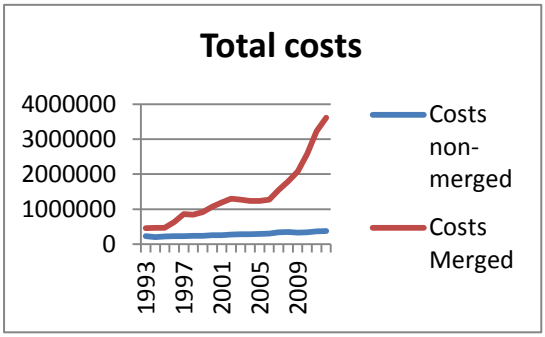

Figure 8: Total costs for merged and non-merged cooperatives. Source: Roskam, 2014

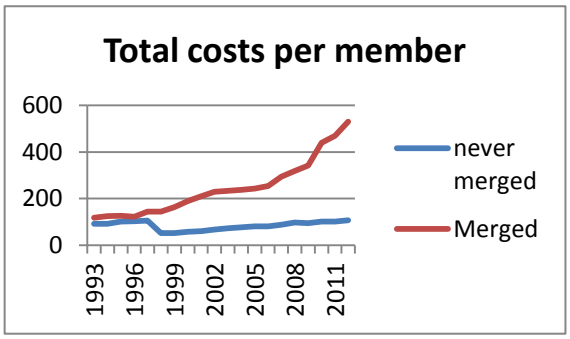

Figure 9: Total costs per member for merged and non-merged cooperatives. Source: Roskam, 2014

Since the estimated coefficients indicate that sales seem to be higher for merged cooperatives, while net results are lower, it seems appropriate to check the evolution of costs, calculated as sales minus net results. In Figure 8 the total costs of merged and non-merged cooperatives are compared. Normally, merged and mostly larger cooperatives have higher total costs, but regularly higher revenues as well. Figure 9 presents increasing total costs per member for merged cooperatives, which indicates costs are increasing more than the number of members increase. These increased costs can be explained by the possible inefficiencies larger cooperatives face. Merging cooperatives for example have to deal with higher management costs, bureaucracy within the company and less efficient employees, due to the merger. Redundant buildings and machinery can also lead to an increase of overall costs.

4.2.5 Additional results of split sample regressions

In table 3 and 4 the estimated parameters of the split sample regression are presented. In this regressions the two main variables, pre-merger and PostM, are not included in the model. Instead, the dataset is split, based on merged cooperatives and cooperatives that are never engaged in a merger. Running two separate regressions for the two subsamples, can tell us whether the independent variables affect performances of merged and unmerged cooperatives differently. The output suggests that medium and large cooperative which did not merge perform, on average, better

than cooperatives that merged. Large cooperatives that merge have a significant (p-value < 0.01) negative relation with ROA and profit margin, estimated coefficients are -0.103 and -0.281, while the cooperatives that are not engaged in a merger have a positive influence of 0.108 and 0.234, on ROA and profit margin. On the contrary, sales and net result per member have , on average, a higher positive correlation for merged cooperatives. Merging is attractive if the cooperative wants to increase sales. The estimated parameters of indicate that, on average, large cooperatives are performing worse than medium cooperatives. A possible explanation for this unexpected result is probably the inefficiencies large cooperatives face. Towards a certain point economies of scale are increasing the performance of cooperatives, but when the cooperatives increase too much in size, the cooperative faces inefficiencies. These inefficiencies can be divergent, for example; personnel costs, management costs and bureaucracy. On the other hand, larger cooperatives should be able to make more efficient use of assets, economies of scale and market power, what indirectly lead to more information.

The influence of the number of members on the net result is 2.8 (p-value < 0.1) in case of merged cooperatives, and -0.8 if a cooperative never merged, indicating an increase in members is preferable for merged cooperatives, but not for unmerged cooperatives. The dairy sector shows a significant positive coefficient of 181877.1 (p-value < 0.01), compared with the other sectors. Within the dairy sector merged cooperatives, what is mainly FrieslandCampina, is performing better than cooperatives that never merged. In the horticultural sector no mergers took place, what means no merger coefficient could be estimated. The performance per sector is varying, the sales per member has a higher correlation with cooperatives that never merged, while the net result per member is statistically significant (p-value < 0.01), and positive for merged cooperatives. This indicates on sector level, merged cooperatives increase net results per member, while the unmerged cooperatives are performing better on sales.

The effect of the total debt on cooperatives that are engaged in a merger and those who do not is clear, the influence of total debt on sales, net results, sales per member and net result per member of medium size cooperatives are statistically significant and positive for merged cooperatives (p-value < 0.01). The effect of total debt on profit margin and ROA is significantly negative for cooperatives that never merged (p-value < 0.01), with estimated coefficient of -0.285 and -0.085. Unmerged cooperatives can use their total debt to increase ROA or profit margin.

Focussing on the ROA, the difference between merged cooperatives and unmerged cooperatives indicate a significant positive correlation, for both medium and large cooperatives, with the performance of cooperatives that never merge (p-value < 0.01). Merged cooperatives increase performance together with an increase in number of members, while cooperatives that never merged show an increase of performance, without a growing number of members. This indicates merged cooperatives are, per member, less efficient, than cooperatives which do not merge.

Table 3: Estimated parameters of split sample regressions; merging/merged cooperatives vs. cooperative never engaged in a merger – dependent variables: Profit margins, ROA and Sales

	Profit-margin		ROA		Sales	
	merging/ merged	never merged	merging/ merged	never merged	merging/ merged	never merged
S2	0.015	0.026***	0.045*	0.071***	704866.7***	-60388.0
	(0.010)	(0.010)	(0.027)	(0.022)	(95526.9)	(43475.0)
S3	-0.103***	0.108***	-0.281***	0.234***	820838.3***	-159367.6*
	(0.024)	(0.021)	(0.065)	(0.047)	(230739.9)	(92190.1)
GDP	0.121	0.021	0.200	0.139	-4947173.0***	-1280335.0***
	(0.194)	(0.067)	(0.526)	(0.152)	(1861807.0)	(297867.2)
Members X1,000,000	0.760	-2.880	2.420	-2.910	-3.0	40.1***
	(1.070)	(1.750)	(2.900)	(3.970)	(10.3)	(7.8)
Sector 1 (Dairy)	0.110***	0.035***	0.302***	0.105***	34993.5	21573.8
	(0.014)	(0.004)	(0.039)	(0.009)	(137402.2)	(17514.9)
Sector 2 (Horticulture)	-	-0.005	-	-0.004	-	75331.4***
	-	(0.004)	-	(0.009)	-	(18229.1)
Sector 3 (Sales and purchase)	0.016*	0.005	0.038	0.015	124870.1	-203.1
	(0.010)	(0.005)	(0.026)	(0.011)	(91939.1)	(20821.7)
Total debt X 1,000,000	0.006	-0.085***	0.005	-0.285***	2.4***	1.4***
	(0.011)	(0.027)	(0.030)	(0.062)	(0.1)	(0.1)
Constant	-0.013	0.017***	-0.031	0.035***	124213.4	72409.6***
	(0.010)	(0.003)	(0.026)	(0.008)	(92385.5)	(15349.3)
R-squared	*0.197*	*0.414*	*0.204*	*0.497*	*0.904*	*0.925*

Notes: *, **, and *** indicate parameters statistically significant at the 10%, 5% and 1% level, respectively; Standard errors in parenthesis
For members and total debt, only the outcomes for profit margin and ROA are multiplied by 1,000,000

Table 4: Estimated parameters of split sample regressions; merging/merged cooperatives vs. cooperative never engaged in a merger – dependent variables: Net Results, Sales/Member and Net Results/ member

	Net Results		Sales/member		results/member	
	Merging/ merged	never merged	merging/ merged	never merged	merging/ merged	never merged
S2	10765.2	-5727.9	175.170***	-438.969***	3.425**	0.880
	(15954.1)	(5553.2)	(28.174)	(73.503)	(1.471)	(2.424)
S3	-205933.1***	30397.3***	112.890	-930.963***	-17.973***	8.787*
	(38536.2)	(11775.7)	(77.625)	(154.288)	(4.054)	(5.089)
GDP	102949.2	-47179.1	-2356.595***	-2275.382***	16.520	-24.1
	(310942.8)	(38047.6)	(641.557)	(548.781)	(33.507)	(18.101)
Members	2.8*	-0.8	-	-	-	-
	(1.7)	(1.0)	-	-	-	-
Sector 1 (Dairy)	181877.1***	3767.8*	-134.959***	-13.057	19.192***	8.435***
	(22947.7)	(2237.2)	(47.312)	(32.586)	(2.471)	(1.075)
Sector 2 (Horticulture)	-	542.2	-	-24.508	-	-1.614
	-	(2328.5)	-	(32.874)	-	(1.084)
Sector 3 (Sales and purchase)	12526.5	2068.0	-197.241***	-103.562***	2.387*	-0.860
	(15354.9)	(2659.6)	(27.268)	(36.481)	(1.424)	(1.203)
Total debt (x 1000)	66.558***	37.583**	0.138***	1.168***	0.005***	1.037
	(17.854)	(15.557)	(0.036)	(0.216)	(0.002)	(0.145)
Constant coeff.	-33280.1**	885.6	293.8***	264.0***	-2.584	3.432***
	(15439.4)	(1960.6)	(31.8)	(28.075)	(1.662)	(0.926)
R-squared	*0.300*	*0.546*	*0.516*	*0.226*	*0.240*	*0.285*

Notes: *, **, and *** indicate parameters statistically significant at the 10%, 5% and 1% level, respectively; Standard errors in parenthesis

Total debt, complete row multiplied by 1000

5. Discussion, conclusion and recommendations

5.1 Discussion

Results

The descriptive analysis presented the main differences between merged and unmerged cooperatives of in the Dutch agro-food sector. Within the graphical analysis of net results 1 company played an important role, Coberco had a major effect on the average net result, due to their in comparison remarkable high net result. Probably, it would be wise to exclude this cooperative from the dataset.

The estimated coefficients of large cooperatives, merged and unmerged, showed for a lot of dependent variables negative correlations. This can be seen as doubtful, especially, because small cooperatives are used as a referring variable. It is possible that inefficiencies increase the costs of larger cooperatives, however, it is unexpected that large cooperatives perform, on average, worse than small cooperatives.

The decision to pick GDP growth instead of annual influences is debatable. Regression analysis is done for both of the variables, and GDP growth is chosen as control variable for annual and economic factors, due to the non-significant coefficients of annual influences. Actually, the estimated coefficients for GDP growth are mostly negative, while the GDP was increasing. Meaning that an increase of the overall economy, decreases sales and sales per member.

Limitations

The main goal of this study was to obtain more insight on the post-merger performance of Dutch agro-food cooperatives. In 1993 40 agro-food cooperatives were in the database, but due to mergers, acquisitions and executions in 2012 only 20 agro-food cooperatives were left. The dataset is divided in merged cooperatives and cooperatives which never engaged in a merger. Finally, in 2012, 7 merged cooperatives were left, which arose from all kind of mergers. It can be wondered if the sample size is large enough to draw conclusions. Especially, because these cooperatives are also divided in different sectors, what makes the data per sector quite dependent of a few cooperatives.

This research has focussed on mergers between agro-food cooperatives, however, possible acquisition or buy-outs are not taken into account, what can have influence on the results of this study. No difference is made between mergers and acquisition due to a lack of data. It is hard to find out the exact financial effect of acquisitions, and in this database most of the cooperatives for sure merged, explained by the names of the final cooperatives.

The literature used in this study explains, cooperatives are not profit-driven, but the main goal is to increase the performance of the members. Taking this into account, it can be questioned how

valuable the outcomes from net result and ROA for example are, as optimizing these variables is not the main goal. Next to this, it is hard to estimate the performance of cooperatives, when the different business strategies are not taken into account. Probably, in one sector cooperatives try to make profit and work towards a financial strong cooperative, while cooperatives in other sectors, take as much debt as possible to grow their business. Previous literature indicates that cooperatives also can have different reasons and goals to merge. Probably, cooperatives know that the first post-merger years will result in negative financial performance, but in time the business will be profitable. In this study the short- and long-term goals are not taken into account. In further research this can be important to look at, and in the same time to control or focus more on individual cooperatives and their performance.

This dataset contains mainly financial performance indicators, but no information about other factors that possibly could influence the performance of cooperatives. It is possible that for example; the rate of diversification, can play a role in the risk management of the company, what can influence the performance.

5.2 Conclusion

There are four reasons to start or join a cooperative: 1) access to produced goods and services; 2) achieve efficiency and economies of scale; 3) managing risk; 4) improvement of members' income. The ongoing scale enlargement and capital constraints forces cooperatives to increase in size, what can be achieved internal or external growth. External growth can be achieved by merging with other cooperatives. The main goals of merging are: to increase in size, to gain scale advantages and to increase bargaining power towards buyers or suppliers. The risk of mergers is mainly the lack of management and organisation, this can lead to higher costs and take away the scale advantages. The so-called inefficiencies occur to companies which grow fast, while they are not ready for the rapid growth.

The results of the regression analysis indicated that cooperative mergers have lower ROA, profit margin and net results than cooperatives that did not merge, however, sales is positivily influenced by mergers. In fact, higher sales leads to higher revenue, however, the net results and profit margin are decreasing. The explaination for this phenomenon is given by the cost analysis showed in figure 8 and 9, where the post-merger costs increase on a large scale. Larger cooperatetives, in terms of members show higher ROA, sales and net results; an increase of cooperative members is influencing the performance of the cooperative positively. The role of total debt is significantly positive for sales and net result, suggesting that cooperatives use total debt to increase sales. Total debt has a more positive influence on merged cooperatives, than on cooperatives that never merged. The possible reason for this difference can be the business strategy, where it is likely that merging cooperatives have growth as one of the main goals.

In terms of sales, on average, merging is attractive for Dutch agro-food cooperatives; focussing on ROA and profit margin, cooperatives that never merged are performing better because internal growth lowers the costs and creates a higher profit margin. Medium-sized cooperatives perform better, due to the inefficiencies large cooperatives face, which lead to a decrease in ROA, net results and profit margin. Merged cooperatives make better use of debt, by increasing sales, net results and

ROA. An analysis of the sector performances indicates the dairy sector performs significantly better than the other sectors, likely due to the economic circumstances, such as prices, yield and risks.

In short, external expansion can lead to more market power, and to an increase in size. However, the increase in costs causes lower profit margins and ROA compared to cooperatives that never merged. Assuming that increasing bargaining power or elimination of capital constraints are the main goals of the cooperative, merging can be a viable option. Although, if the main goal is to increase profits or ROA the analysis indicates that cooperatives may establish growth by means of internal expansion.

Previous studies showed that cooperative mergers do not have a significant positive effect on financial performance, however based on the theory an increase of performance is expected. This research shows even at some parts have a significant negative effect of mergers on cooperative performance.
Concluding, cooperatives in the Dutch agro-food sector can use mergers for external growth, in terms of increasing sales, however, on average, mergers do not contribute towards an increase in profit margin and ROA.

5.3 Recommendations

The Dutch agro-food sector is an important sector in the Netherlands, and cooperatives play a major role in the processing and trade of agricultural products and services. This research showed that mergers show a positive correlation with sales, indicating an average increase of sales after merger. However, the profitability is negatively influenced by mergers. In future research it can be interesting to focus more on individual cooperatives. Several factors are influencing the dependent variables, but it would be more informative to focus on single cooperatives, to identify their decision making and their short- and longterm objectives. In this way the observed behaviour can be explained in a more extended way.

Future research could assess what the members think of the mergers. Do the members agree with the decision to merge? And what is for the members the main goal of mergers? A more qualitative research would be needed to research this questions, and to see wether members are satisfied with the results or mergers.

Another important issue is the difference between mergers and acquisitions. More data should be collected to take this into account, but it can have major influence on for example the post-merger costs of a cooperative.

To make the results of this study more powerful, it would be wise to replicate this research with a bigger sample. More elaborated macro-economic factors could be used to control in a more extensive way. Additionally, the dataset should be enlarged with information about prices or other waves in a certain sector to explain the results in a more precise way. Finally, future research could try another way to control for size, in this research size was defined in total assets. Maybe other results will be find, when the size is defined in other variables.

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Appendix

Table 1: Results of Chow test, comparing the 2 data groups.

	SSE1	SSE2	SSET	N1	N2	Ntot	K	F	Critical value
ROA	6.321534	0.595366	7.643775	285	258	543	8	6.922593	1.955962
net result/ Member	26177.24	8719.25	37696.73	285	258	543	7	6.064146	2.026878
Sales/member	9596678	8014866	20235553	285	258	543	7	11.25967	2.026878
profit	0.860417	0.115756	1.09175	285	258	543	8	7.799505	1.955962
net result	2.21E+12	3.72E+10	2.67E+12	285	258	543	8	12.31029	1.955962
sales	7.92E+13	2.28E+12	9.99E+13	285	258	543	8	14.90299	1.955962

Note; SSE1 refers to the sample of cooperatives that are engaged in mergers
SSE2 refers to the sample of cooperatives that are never engaged in mergers.
SSET refers to the sum of both samples.

The critical F-values are based on a 0.05% significance level.