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# Equity Management Practices in Italian Agricultural Cooperatives: a Cluster Analysis Approach.

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**Abstract:**

In this paper, equity management practices of Italian agricultural cooperatives are described and discussed. Financial statements of 1.483 cooperatives are analyzed in order to provide empirical support to the study. Data confirm cooperative undercapitalization and disclose the existence of diversity in equity management practices even within the same business sector. Thus, in order to highlight the relations between cooperative market strategies and equity management practices a cluster analysis is proposed. Seven main strategic approaches for Italian cooperatives are identified and the emerging equity management practices are discussed. The empirical analysis supports the conclusion that a large number of Italian are implementing “perverse” approaches, such as dependence from public funding and minimization of equity and investments. Considering increasing competition, without an innovative equity management approach, the majority of the analyzed cooperative is expected to suffer of relevant competitive disadvantage.

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<sup>2</sup> This paper is the result of a research jointly financed by the University of Cassino and Confcooper – a federation of agricultural cooperatives located in Rome.

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### **Introduction**

Undercapitalization is one of the most common strategic weaknesses of agricultural cooperatives worldwide. Field Literature stresses that undercapitalization often prevents cooperatives from effective growth strategies, undermining their overall competitiveness (Chesnik, 1997). In Italy, ten year after a radical innovation in cooperative regulation, many agricultural cooperatives are still in financial distress due to excessive leverage, which reduces cooperative’s efficiency by adding costs both in terms of higher transaction costs and missed profit opportunities (Fiorentini 1995; Manelli 1996).

The undercapitalization issue is well-know to agricultural economic literature which attributed the difficulties in building an efficient capital structure to various factors such as the absence of a secondary market for stocks, the high opportunity cost of money for farmers and the investment horizon of patrons (Staatz, 1989; Murray, 1983; Vitaliano, 1983). Peterson discussed the capitalization problem from the patron-investor point of view, using financial theory (Peterson 1992). Italian authors related the issue directly to the specific Italian cooperative regulation about the legal limits on dividends, equity shares and equity redemption (Iannello 1994; Mazzoli 1994; Mazzoli and Rocchi 1996). More recently, literature discussed the consequences of ill-defined property rights on cooperative capitalization (Cook and Iliopoulos 2001).

Because of the relevance of the problem, managerial practice has developed several tools to manage cooperative equity. In this paper, equity management practices are identified and described through the analysis of financial data of 1483 Italian agricultural cooperatives<sup>3</sup>. Due to the heterogeneity of the sample, a cluster analysis has been applied to identify seven typologies of homogeneous cooperatives, and the equity structure of each cluster has been analyzed. The result of the analysis permitted to compare and contrast the different equity management practices showing the relations between capital structure and strategic approach to the cooperative business.

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<sup>3</sup> The dataset has been provided by Confcooper

## Capitalization of Italian agricultural cooperatives: current regulation and key statistics

Italian commercial and fiscal laws regulate cooperative equity in detail. Current regulation allows cooperative to build equity in three ways:

1. *Stocks*. in order to be allowed to patronize the cooperative, farmers must purchase equity shares. Cooperative equity are subjected to several legal limits. In particular, a maximum return on equity is fixed (2% more than return on postal bonds) and members leaving the cooperative obtain the face value of their shares (plus inflation). In 1992, Italian regulation introduced the possibility for non-farmers of supporting agricultural cooperatives, providing incentives (an higher return limit)
2. *Patronage retention*. Cooperatives may retain financial resources that are considered unallocated equity. It must be pointed out that It must be noted that, according current Italian regulation, it is not possible to allocate retained patronage. Thus, retained patronage is often considered as financial loss by members, because it cannot be redeemed. Usually, retention is divided into patronage retention (if it is proportional to the value of each member's patronage) or income retention (otherwise).
3. *Public contribution*. Public sector can contribute to cooperative equity through direct payments that are considered as unallocated equity. This practice was fairly common in the '80 and it became one of the most important equity sources for agricultural cooperatives (Giacomini and Petriccione 1992). The decline of public contribution during the '90 is considered one of the most important causes of the financial distress of Italian agricultural cooperatives (Williams 1996).

The study sample can be used to describe the current Italian agricultural cooperative capitalization. The dataset is composed of 1483 agricultural cooperatives of different sectors. Observations were located 60.3% in the Northern part of Italy, 19.5% in Central Italy and 20.2% in the South. Sample size represents approximately 16.5% of Italian cooperative population. Information are derived from cooperative financial statements and refers to 1997 fiscal year. In Appendix (Table A-1), key statistics are summarized by sector.<sup>4</sup> Data show that, on average, Italian cooperatives are mostly small and medium enterprises, even though there are some relevant exceptions.

Table 1 presents average values and standard deviations of three key indices describing cooperative capitalization. The equity/asset ratio (EAR) indicates the percent share of total assets financed through equity; the Allocated Equity Ratio (AER) expresses the percentage of allocated equity on total equity, the Internal Sources Ratio (ISR) indicating the capacity of the cooperative of accumulating equity from business

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<sup>4</sup> The sector breakdown includes some categories that may result unfamiliar for non-Italian readers. Specifically, in Italy, the services and the farm supply cooperatives are usually considered a single sector, which however does not include credit or electric cooperatives. The joint farming sector is composed of cooperative in which members jointly farm the common farmland and benefit of the profit of the sales of products (usually the self-consumption of the products is marginal compared to the commercial activity). Forestry cooperatives are characterized by a specific eco-farming activity in rural area woodlands. These cooperatives usually receive the land in concession from local authorities.

operations<sup>5</sup>. These indices must be carefully considered, because of the high values of the standard deviation. In fact, in each sector, remarkably diverse cooperatives coexist, implementing a broad set of equity management strategies.

The overall equity/asset ratio is 22%, supporting of the undercapitalization problem. The issue is severe particularly in dairy sector, where equity represents only 11% of total financial sources. Total ISR is a negative value (-0,13), implying severe financial loss. This total result is due mainly to the contributions of livestock, fruit and vegetables and dairy sectors, while other businesses present positive values of the variable. However, the high standard deviations suggest that the overall results are influenced by critical performances of a relatively small number of firms. Direct analysis of data supports this conclusion. The AER average value is 0,54, stating that the allocated equity represents approximately half of the total equity. The high percent of unallocated equity, compared with the low ISR index, implies the relevance of public contribution in cooperative equity management.

**Table 1:** Capitalization indices for Italian agricultural cooperatives (1483 cooperatives – fiscal year 1997)

Business sectors	EAR		ISR		AER	
	Equity/Asset Ratio		Internal Source Ratio		Allocated Equity Ratio	
	Avg.	St. Dev.	Avg.	St. Dev.	Avg.	St. Dev.
Dairy	0,11	0,16	-0,17	3,70	0,44	0,82
Farming	0,37	0,29	0,14	0,35	0,26	0,39
Forestry	0,28	0,27	0,02	0,21	0,34	0,69
Fruits and Vegetables	0,25	0,22	-0,43	6,66	0,43	0,50
Grain	0,22	0,20	0,02	0,07	0,57	1,75
Livestock	0,25	0,25	-0,57	6,16	0,90	2,43
Olive Oil	0,39	0,25	0,00	0,45	0,89	4,00
Poultry	0,20	0,20	0,82	3,42	0,28	0,29
Services	0,32	0,30	0,17	1,77	0,76	3,08
Sugar and rice	0,38	0,17	0,09	0,04	0,04	0,04
Tabacco	0,16	0,20	-0,01	0,11	1,73	2,90
Wine	0,21	0,15	0,01	0,46	0,33	0,37
<b>Sample Avg./St. Dev.</b>	<b>0,22</b>	<b>0,22</b>	<b>-0,13</b>	<b>1,95</b>	<b>0,54</b>	<b>1,44</b>

Source: Confcooper

The overall analysis of capitalization indices provide empirical support to the undercapitalization hypothesis, stressing the relevance of the issue. Also the high standard deviation of index values implies that the business sector break-down is not able to highlight the difference in equity management strategies, and a more suited classification is required. In order to overcome this problem, a cluster analysis, based on a factorial analysis is performed. Also, the cluster analysis permits the identification of the emerging strategies of Italian cooperatives (Piccinini 1992; Lombardi and Mele 1992). Thus, a comparison is possible between market strategies and equity management practices.

<sup>5</sup> EAR has been calculated by dividing the value of equity by total asset; AER has been derived by dividing the allocated equity (the sum of members' equity share) by total equity; ISR has been computed by dividing the sum of patronage retention, income retention, profit and loss by revenues.

### **Classifying Italian agricultural cooperatives: results of the cluster analysis.**

Financial theory states that capital structure depends on several factors: scale of operation, business sector, marketing approach and capital budgeting strategies are just few of the determinants (Barton et al. 1996; Titman and Wessel 1988). Thus, in order to give a deeper insight into equity management practices, a factorial analysis and a cluster analysis have been performed. The approach makes possible to discuss the relation between the cooperative market strategy and the adopted equity management strategy.

The variables utilized for the factorial analysis and the following clustering are described in Table A-2, in the appendix. The correlation matrix reports the absence of linear correlation across variables. Some variables are expressed in logarithms in order to take into account economies of scale.

The factor analysis has been performed applying the principal components method (Everitt 1980; Jimbu and Lebeaux 1983). Five factors have been identified: *Scale of Operation*, *Asset Structure*, *Membership*, *Strategy* and *Labor Intensity*. Table A-3, in the appendix, summarizes the five factors, which on total represent 88.9% of total variability, reporting their correlation with each base variable.

The *Scale of Operation* factor is characterized by high revenues and equity per member and high value of assets. It must be noted that the factor refers to the scale of operation both of members and cooperatives, implying the relevance of patrons' characteristic in explaining data variability. The *Asset Structure* factor contrasts cooperatives with high incidence of durables (FATA variable) and cooperatives with high value of inventory, describing the composition of firm's assets. *Membership* factor is defined almost completely by the variable related with the number of members. The factor defining the cooperative production *Strategy* contrasts the Total Asset Turnover ratio with the percent incidence of inventory on total assets, stressing the differences between bargaining cooperatives (which strategy is based on a rapid inventory turnover) and food processing cooperatives (which presents larger inventory and higher equity investment per member). Finally the *Labor Intensity* factor is highly correlated with the LR variable.

The five factors has been utilized to cluster the 1483 cooperatives in 7 homogeneous groups. Table 2 reports a brief description and key data for each cluster.

**Table 2: Results of the cluster analysis (financial data in Euro – fiscal year 1997)**

<b>Clusters</b>	<b>N. of Coop.</b>	<b>Avg. Revenues</b>	<b>Avg. Total Asset</b>	<b>Avg. Equity</b>	<b>Avg. N. of Member</b>	<b>Avg. Workforce</b>
Bargaining & Service Coop.	304	775.915	255.685	23.428	106	2
“Hollow” Coop.	17	884.169	38.578	11.396	102	3
Labor Coop.	69	338.802	631.071	169.184	104	13
Durable-Sharing Coop.	175	190.129	307.752	93.692	123	2
“Public” Coop.	350	6.359.382	6.011.503	1.383.367	516	21
Industrialized Coop.	321	9.246.654	6.683.373	1.546.597	30	29
Value-Added Coop.	247	2.026.582	2.347.404	73.743	24	3
<b>Sample Total/Avg.</b>	<b>1.483</b>	<b>4.044.961</b>	<b>3.372.633</b>	<b>696.928</b>	<b>174</b>	<b>13</b>

Source: Confcooper

The seven clusters describe the emerging market strategies of Italian agricultural cooperatives. The first group – *Bargaining & Service* cooperatives – is specialized in providing members with “intangibles” services. Most of these cooperatives operates in dairy or fruit and vegetable business, bargaining the best market price for patrons’ products. A number of cooperative is in the service business sector, providing technical assistance on members’ demand. Virtually without inventory or stocked goods, they are able to generate revenues with few assets or workforce. The high Total Asset Turnover (average TAT=3.23), and the low average workforce (2 units), reflect these characteristics.

*Hollow* Cooperatives present similarities with the *Bargaining & Service* cluster, but their characteristics are more extreme. The average total asset value of 38.578 Euro shows that they are able to run a business without relevant capital investments. Nevertheless, their average revenues are higher than the previous cluster. The majority of these cooperatives is in the fruit and vegetable business sector. Although their number is limited (just 17 units), their unique characteristics makes them to emerge as a robust cluster.

The cluster of *Labor* cooperatives groups firms in which members’ personal work is a significant component of the business. On average, labor cost amount to 61% of revenues, providing evidence to the identification of the cluster. Labor cooperatives operates mostly in labor-intensive businesses such as forestry, joint farming and services.

*Durable-Sharing* cooperatives’ mission is to allow small farmers to utilize costly fixed assets at a fair price. Members provide equity to buy the durables and then they utilize jointly the asset, being charged the operating expenses only. This practice is widely used in olive oil and agricultural service business sectors. The cluster is characterized by relevant fixed assets (average FATA = 0.71) and low average revenues per member. The low fees for assets use causes also a extremely low value of total asset turnover (TAT=0,70).

*Public* cooperatives are characterized by a large membership of small farmers. These firms are able to achieve a large average scale of operations by processing products of a large number of small patrons. Also, the high number of members allows these cooperatives to raise enough equity to finance relevant asset investments. However, the low total asset turnover ratio (TAT=1.06) questions the efficiency in asset management. These typology of cooperatives is associated mainly with the wine, fruit and vegetables and dairy business sectors.

The cluster of *Industrialized* cooperatives presents the highest average values of revenues, total asset, equity and workforce units. The highest values of average revenues per members and average equity per member support the hypothesis of a membership composed of large, professional farmers. Poultry, livestock, dairy and fruit and vegetables are the business sectors more closely associated with the cluster, providing evidence of the current industrialization process occurring in these fields, especially in Northern Italy.

Finally, the *Value-Added* cooperatives include mostly dairy firms located in the Emilia Romagna region (85% of the cluster observations). Their business is related with the production of long-aged typical cheese such as Parmesan or Grana. The most remarkable financial characteristics is the high value of inventory (INTA=0.7), due to the long duration of the aging process and the high per unit price of the final products. These cooperative are able to achieve an high value of total assets with relatively small equity investment through an intense financial leverage.

### Competitive Strategy and Equity Management Strategies

In Table 3 average capitalization indices by cluster are reported. Comparing and contrasting different equity management approaches, the analysis of the indicators offers a deeper insight into equity management practices of Italian agricultural cooperatives.

**Table 3:** *Capitalization indices – average value by cluster*

Clusters	EAR	ISR	AER
Bargaining & Service Coop.	0,22	-0,31	0,89
“Hollow” Coop.	0,48	0,00	0,83
Labor Coop.	0,30	-0,10	0,57
Durable-Sharing Coop.	0,40	-0,87	0,46
“Public” Coop.	0,22	0,10	0,35
Industrialized Coop.	0,25	0,04	0,50
Value-Added Coop.	0,04	0,01	0,46
<b>Sample Averages</b>	<b>0,22</b>	<b>-0,13</b>	<b>0,54</b>

Source: Confcooper

*Bargaining & Services* cooperatives present high leverage, their equity being 22% only of total liabilities. They build their equity mainly with members upfront shares, as shown by the high AER and the negative ISR. This equity management approach reflects the intense price competition that these cooperatives are facing. The necessity of granting patrons competitive prices prevents these cooperatives from retaining financial resources and, on average, caused severe financial losses. *Bargaining & Service* cooperatives’ undercapitalization can be considered a consequence of competition: in order to attract patrons, per member equity share is, on average, low and income retention and depreciation become difficult practices because they would lower patronage price. To build an effective equity base, these cooperatives may implement two strategies: increase membership and reduce overhead costs. By increasing membership, *Bargaining & Services* cooperatives achieves more equity because they sell more shares and because they can apply patronage retention maintaining a competitive price, exploiting economies of scale and increased market power. Thus, in *Bargaining & Services* cooperatives, equity management and membership management are deeply interrelated: cooperatives with larger membership (and patronage volume) on average have a stronger equity base. It must be noted the scarce relevance of public contribution to the equity of these cooperatives, due to the common practice of giving funding almost only for purchasing fixed assets.

*Hollow* cooperatives present the highest EAR due to the high value of members' shares compared to total assets. Unlike, *Bargaining & Service* cluster, on average, these cooperatives do not suffer of financial losses. This cluster shows a successful equity management and good economic performances, supporting the conclusion that *Hollow* cooperatives can be considered enhanced *Bargaining & Service*.

*Labor* cooperatives are characterized by difficulties in building equity: negative ISR (no patronage retention) and low average value of AER (low value of members' shares) imply that most of equity sources are external. In fact, public contribution is a key element in the equity management strategy of these cooperatives also. Public sector is a relevant contributor to the equity of *Durable-Sharing* cooperatives also, because the common fixed assets are often purchased with the support of public intervention. The most remarkable characteristics of this cluster is the financial loss, amounting to 87% of revenues. Although significantly affected by the critical performance of a relatively small number of observations, the value of the index reports the severe difficulties that these cooperatives find in reaching a financial break-even.

The equity management approach emerging in *Public* cooperatives is influenced by the specific characteristics of the cluster. The cooperatives are leveraged (EAR=22%) mostly because of the low value of members' shares compared to total assets. Allocated equity represents 35% only of total equity. However, public contribution and patronage retention partially overcome this problem. In fact, these cluster is the only one that is using the internal sources of equity extensively. On average, 10% of revenues are retained as financial resources, which represents a sizable share. The practice may be explained considering the large membership characterizing these cooperatives. As the number of members increases, individual patrons' participation to cooperative management becomes increasingly difficult and, consequently, managers have more opportunities of retaining patronage. Effects of manager power on cooperative capital structure have already been studied by literature (Murray 1983; Russo et al. 2001).

Although the values of capitalization indicators are similar to the previous cluster, *Industrialized* cooperatives present a different approach to equity management. On average, these cooperatives are leveraged: equity represents 25% of total assets. Allocated equity is 50% of total, implying that public contributions and patronage retention are important equity sources. Unlike *Public* cooperatives, the total value of the allocated equity is achieved through large contributions of a small number of members. In these cooperatives, patrons become actual investors, providing sizable upfront payments and willing to accept patronage retention, as shown by the high ISR. The scale of allocated equity implies that members are willing to invest significant financial resources in the cooperative projects.

*Value-added* cooperatives' present an unique capital structure. They are almost completely leveraged: equity is 4% only of total asset value. Moreover, the allocated equity ratio is 46%, showing that upfront members' contribution is minimal. Even though financial loss are rare, on average, these cooperatives do not accumulate internal financial resources. The emerging capitalization strategy is based on the minimization of members' contributions (both equity shares and patronage retention). Due to the spatial concentration of this cluster, it might be possible that this strategy is made

possible by local factors - such as trust relations with local banks - but the analyzed dataset (based on financial reports) does not provide enough information to confirm this hypothesis.

### **Conclusions: Equity Management Practices of Italian Agricultural Cooperatives.**

The analysis of the dataset confirms undercapitalization of Italian cooperatives. The high leverage stresses the importance of equity management practices in order both to increase equity sources and utilize them more efficiently. The empirical study supports the hypothesis of the existence of different equity management techniques, identifying six main approaches.

1. *Maximization of public support.* This approach is applied by almost all the identified cluster, excepted *Bargaining & Service* and *Hollow* cooperatives. Because of their important social role in rural Italy, Cooperatives has been heavily supported by public sector. However, the increasing budget constrain to public deficit-spending and the new vision of CAP, are questioning the feasibility of this approach. As public funding becomes increasingly scarce, the possibility of building equity on external contribution turn out to be more difficult. Public expenditure cuts may compromise competitiveness of the cooperatives that are not able to retain financial resources from their own operations. The issue is expected to be particularly severe for *Durable-Sharing* cooperatives, at least in the long run, because their high capitalization is based on public contribution and they, on average, spend equity to support their operations (as shown by the negative ISR). Also, *Labor* cooperatives are expected to endure some financial distress, unless they improve the average efficiency of their operations.
2. *Asset minimization.* Although this approach cannot be considered an equity management practice in the proper sense, some cooperatives deal with the capitalization problem by minimizing labor costs and their investments in fixed assets. Instead of searching for additional equity, they accept the constraint and focuses on strategic variables that are more under managers' control, such as labor costs or capital budgeting. It is the case, for example, of *Bargaining & Service* and *Hollow* cooperatives. Although this approach reduces the need of equity, it must be stressed that it requires remarkable efficiency in asset management to be successful.
3. *Membership growth.* Developing a larger membership is a common practice to increase equity. In particular, *Bargaining & Service*, *Hollow* and *Public* cooperatives utilizes this approach extensively. Growing membership brings new equity and, through increased patronage, helps developing economies of scale, improving performance and, potentially, ISR. However, especially in the short run, a growth strategy usually implies competitive prices for members and low upfront payments in order to attract more patrons. Thus, the strategy of growing to obtain the necessary equity requires a careful balance of the member incentives. The empirical analysis showed that this strategic issue is critical for *Bargaining & Service* cooperatives. In order to provide competitive prices to patrons and maintain membership, these cooperatives cannot retain equity from their operations and even incur in financial loss. Thus, in order to implement a

membership growth strategy successfully, cooperatives must achieve high operation efficiency, as in the case *Hollow* cooperatives.

4. *Manager power*. The manager power approach is based on imposing capitalization on members. This approach has been extensively described by Murray (1983) and is widely used in Italian Public cooperatives, which present the highest value of ISR. In these cooperatives members are willing to accept patronage retention proposed by manager, even if this practice reduces their income. Large membership favors this practice because individual members have less control on the cooperative decision and they must either accept retention rather or leave the cooperative. Empirical evidence supports the hypothesis that cooperatives with “powerful” managers have, on average, higher EAR (Russo et al.).
5. *Members’ commitment*. This approach is similar to IOFs practices and it is based on building equity from a small number of large and professional farmers, in order to pursue a specific marketing objective. The practice is common in Industrialized cooperatives in which the equity management is a tool to pursue members’ strategic objectives. The relevance of individual contributions requires strong commitment.
6. *Equity minimization*. The last emerging approach to equity management is based on minimizing individual members’ contributions. The practice is used by *Bargaining & Service* and especially *Value-Added* cooperatives. Cooperative utilizing this approach, are extremely leveraged using external sources to meet financial needs. As stated by financial theory, this practices increase both the returns and the risk of the business (Brealey and Myers 1996). Members are able to benefit of the cooperative business without relevant off-farm investments, but, at the same time, the high leverage increases the risk of cooperative bankruptcy.

The six approaches are not mutually exclusive, originating mixed strategies. In Table 4, an association between strategic clusters and equity management approach is proposed.

**Table 4:** *Matrix of association between strategy and equity management approach*

	<b>Public Cont. Max.</b>	<b>Asset Minimiz.</b>	<b>Members. Growth</b>	<b>Manager Power</b>	<b>Members’ Commitment</b>	<b>Equity Minimiz.</b>
<b>Barg. &amp; S.</b>		✓	✓			✓
<b>Hollow</b>		✓	✓			✓
<b>Labor</b>	✓					
<b>Durab.-S.</b>	✓		✓			
<b>Public</b>	✓		✓	✓		
<b>Industr.</b>	✓				✓	
<b>Value-Add.</b>	✓					✓

Equity management is a key problem for Italian cooperatives. The analysis show that current practices include some “perverse” behavior such as dependence from public funding and minimization of equity and investments. The survey supports the conclusion that Italian patrons (with the relevant exception of *Industrialized* cooperatives) cannot be considered as investors, because they are unwilling to provide real capital investments. Beside *Industrialized* cooperatives, an high average value of equity is achieved only when members can be “forced” by managers (*Public*).

In the large majority of cases, the equity constraint is so strong that cooperatives not finding external sources must either reduce investments or take the risk of excessive leverage. Considering the increasing cuts to public contributions, this situation is expected to pose a severe threat to the competitiveness of Italian agricultural cooperatives. In fact, in the evolving food system, capital investments are becoming a key factor in successful strategies. Without an innovative equity management approach, the majority of the analyzed cooperative is expected to suffer of relevant competitive disadvantage.

## References

- Barton D., Parcell J. and Featherstone A. (1996). *Optimal capital structure in centralized agricultural cooperatives*, paper submitted for contributed paper submission WAEA Meetings
- Brealey R. and Myers S. (1996): *Principles of corporate finance* McGraw Hill – New York
- Chesnick D. (1997): “Leveraging the future: higher debt levels among large coops may be cause of concern” in *Rural Cooperatives* n. 6: pag. 11-15
- Cook M. and Iliopoulos C. (2000): *Ill-defined Property Rights in Collective Action: The Case of US Agricultural Cooperatives* Prepared for: Claude Menard (ed.) Institutions, Contracts, and Organizations. London, UK:Edward Elgar Publishing Ltd.
- Everitt B. (1980): *Cluster analysis* Halsted Press, London
- Fiorentini G.(1995): “Forza e debolezza delle cooperative: aspetti economici e finanziari” in proceedings of the “Seconda giornata di studi economici sulla cooperazione”
- Giacomini C. and Petriccione G. (1992): *Sviluppo e crisi della cooperazione agro-alimentare negli anni ottanta* in Pacciani A. and Petriccione G. (Editors): La cooperazione agro-alimentare in Italia - INEA
- Iannello G. (1994): *Impresa cooperativa e nuove prospettive di finanziamento* Ed. CEDAM- Padova
- Jambu M., Lebeaux M. (1983): *Cluster analysis and data analysis* Elsevier – New York
- Lombardi P. and Mele G. (1992): *Indagine sulle performance di un campione di cantine sociali che non effettua l’imbottigliamento attraverso diverse metodologie di analisi.* in Pacciani A. and Petriccione G. (Editors): La cooperazione agro-alimentare in Italia - INEA
- Manelli A. (1996): *La gestione finanziaria dell’impresa cooperativa* Ed. SEAM – Roma
- Mazzoli M. (1994): “L’impresa cooperativa ed I mercati finanziari. Aspetti economici” in *Rivista della Cooperazione* n. 14
- Mazzoli M. and Rocchi E. (1996) *La Finanza delle Cooperative* Liocorno Editore - Milano
- Murray G. (1983): “Management strategies for corporate control in British agricultural cooperatives” in *Agricultural Administration* n. 14: pag. 51-63 (part I) and 81-94 (part II)
- Peterson H. C. (1992): “The economic role and limitations of agricultural cooperatives: an investment cash flow derivation” in *Journal of Agricultural Cooperatives* vol. 7 n. 61

- Piccinini A. (1992): *Analisi statistica e fattoriale degli indici di bilancio delle cooperative agricole* in in Pacciani A. and Petriccione G. (Editors): *La cooperazione agro-alimentare in Italia* - INEA
- Sotte F., Sopranzetti C. (1997), Strumenti per l'analisi economico-finanziaria della cooperazione agro-alimentare, in *Rivista di Economia Agraria*, Il Mulino, 1-2
- Staat J. (1989): *Farmer cooperative theory: recent developments* ASC report n. 84, USDA
- Titman S. and Wessel R. (1988). "The determinants of the capital structure choice" *Journal of finance* 43, 1988: pag. 1-19.
- Vitaliano P. (1983): "Cooperative enterprise: an alternative conceptual basis for analyzing a complex institution" in *American Journal of Agricultural Economics* n. 5 pag. 1078-1083
- Williams W. 1996. *Introduction* from the proceeding of the meeting Cooperazione e capitalizzazione, quale via alla finanza per lo sviluppo e l'occupazione? Bologna April, 15 1996

## Appendix: additional statistics

**Table A-1:** *Sample Key Data (financial data in Euro – fiscal year 1997)*

	N. of coop.	Avg. Revenues	Avg. Total Assets	Avg. Equity	Avg. N. of Members	Avg. Workforce
Dairy	433	4.667.922	3.894.792	559.541	57	10
Farming	74	536.183	848.921	209.315	33	6
Forestry	23	222.759	254.434	61.486	60	10
Fruits and Vegetables	227	5.078.991	4.607.489	1.129.314	195	25
Grain	38	3.360.258	2.305.857	354.353	350	5
Livestock	153	4.429.341	2.320.042	535.574	60	20
Olive Oil	91	677.548	730.801	226.090	333	4
Poultry	18	17.930.468	6.329.026	529.648	20	60
Services	188	1.883.017	1.090.942	295.381	127	3
Sugar and Rice	2	52.042.809	63.176.979	31.068.640	1.555	172
Tabacco	13	7.165.374	6.068.867	2.452.440	362	27
Wine	223	4.667.575	5.244.480	1.091.210	453	12
Sample Total/Avg.	1483	4.044.961	3.372.633	696.928	174	13

**TABLE A-2:** *Variables utilized in the factor and cluster analysis*

Variable	Description	Average	St. deviation
REVMEM	Logarithm of average revenues per member	17.04	2.39
EQMEM	Logarithm of average equity per member	14.64	2.43
TAT	Total Asset Turnover	1.74	3.49
INTA	Inventory/Total Asset ratio	0.18	0.27
LR	Labor Cost/Revenues ratio	0.10	0.14
NMEM	Logarithm of number of members	4.00	1.51
FATA	Fixed Assets/Total Assets ratio	0.29	0.25
TA	Logarithm of Total Assets	21.09	1.99

The total asset variable has been introduced to take into account the scale of operations. It has been preferred to the revenues variable (which was highly correlated) because of its closer relation with capital budgeting issues. The composition of cooperative assets is described by INTA and FATA variables, which indicate respectively the ratios between the value of inventory and the total assets and between fixed and total assets. INTA is a relevant variable especially in Wine and Dairy sectors, because of the aging products. FATA quantifies cooperative investments in durables. REVMEM and EQMEMB express the average revenues per member and the average equity per member. These variables represent the scale of the economic intercourse between patron and the cooperative: REVMEM approximates the scale of patronage, while EQMEM express the value of the members' investments in the cooperative business. The correlation index between the two variables is 0.56, excluding collinearity. The total asset turnover (i. e. the revenues/total asset ratio) indicates the cooperative efficiency in asset management. The LR variable reports the incidence of labor costs on revenues, evaluating the intensity of labor in the production process. Finally, the number of members has been included in the analysis because its relevance in cooperative management. It must be noted that, in order to avoid tautological results, the capitalization indices has been excluded from the set of variables.

**Table A-3:** *Emerging Factors*

Factor		Factor-Variable Correlation Indices							
		REVMEM	EQMEM	TAT	INTA	LR	NMEM	FATA	TA
1	Scale of Operat.	-0,86	-0,69	0,32	-0,56	0,11	0,27	0,10	-0,83
2	Asset Structure	0,21	-0,49	0,43	0,48	-0,46	-0,20	-0,81	-0,19
3	Membership	-0,14	-0,16	-0,05	0,06	-0,34	0,90	-0,07	0,47
4	Strategy	0,25	0,31	0,71	-0,44	-0,35	0,02	0,17	0,05
5	Labor Intensity	0,18	-0,04	0,34	-0,03	0,73	0,22	-0,27	0,13