This is to certify that the

thesis entitled

Italian Agricultural Cooperatives in the Evolving Food System

presented by

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has been accepted towards fulfillment
of the requirements for

M. S. degree in Agricultural Economics

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Date 3/29/00

ITALIAN AGRICULTURAL COOPERATIVES

IN THE EVOLVING FOOD SYSTEM

by

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF SCIENCE

Department of Agricultural Economics

2000

ABSTRACT

ITALIAN AGRICULTURAL COOPERATIVES IN THE EVOLVING FOOD SYSTEM

By

Carlo Russo

The thesis addresses issues related to the management of Italian agricultural cooperatives. In particular, their international competitiveness and their potential disadvantages compared to investor owned firms are discussed. The thesis is composed of three papers. Although every paper can be read independently, they all address the general topic.

In the first essay, "Alternative Italian Agricultural Cooperative Strategies in the Changing EU Food System," a sample of Italian cooperatives was analyzed and compared to the US in order to assess strengths and weaknesses. Major strategic trends in Italian agricultural cooperatives such as the pursuit of a multifunctional cooperative strategy to meet the social demands for agricultural services were identified. The second essay is entitled "Members' Financial Evaluation and the Efficiency of Cooperatives' Decision Processes." In this paper, a financial model describing the cooperative investment evaluation process was proposed. The results suggest that cooperatives evaluate their investment differently than investor owned firms and that cooperatives' decision process is characterized by higher transaction costs. The third essay, "Effects of Managers' Power on Capital Structure: A Study on Italian Agricultural Cooperatives,"analyzes the problem of cooperatives' undercapitalization. In the paper, an econometric model was estimated to test the hypothesis that managers can significantly influence the capital structure of a cooperative.

Acknowledges

This thesis can hardly be considered the work of a single person. Many people deserve recognition and thanks for their involvement and contributions. Michigan State University and the Department of Agricultural Economics provided the funding necessary for me to complete my studies. My Italian mentor, Prof. Massimo Sabbatini, always encouraged and supported me in my choices.

A sincere thank you is due to my committee, Drs. Dave Weatherspoon, H. Christopher Peterson and John Kerr. Dr. Dave Weatherspoon spent countless hours (including some Sundays) reviewing this thesis, showing potential areas of improvement, dealing with my poor English and my inability to focus on one problem at a time. I really enjoyed working with him and particularly the free exchange of ideas and opinions. Doctor Peterson's advice and personal support has been invaluable. With his deep knowledge of the subject, he contributed to improve my work significantly. In addition, Doctors Steve Hanson, John Staatz and Robert Myers provided useful advice and suggestions.

On the Italian front, I really thank Mr. Luciano Quiriconi and Mr. Vincenzo Mannino for their support and encouragement, especially in the first stages of my work. Also I would like to thank Mr. Nazzareno Zangaro, Mr. Ugo Menesatti and all the Auditing Group at Confcooperative for the countless hours spent talking about cooperatives, how they work, what they are doing and, above all, "why we should not burn them all to ashes and live happily thereafter."

Also a special thank is due to all my friends here in Lansing. They made all this an experience to remember.

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List of Acronyms

EU:	European Union
CAP:	Common Agricultural Policy
CAPM:	Capital Asset Price Model
ETC:	External Transaction Costs
GLS:	Generalize Least Square
IOF:	Investor Owned Firm
IRR:	Internal Rate of Return
ISTAT:	Istituto Italiano di Statistica (Italian Statistic Institute)
ITC:	Internal Transaction Costs
NGC:	New Generation Cooperative
NPMC:	Non Powerful Manager Cooperatives
NPV:	Net Present Value
PMC:	Powerful Manager Cooperatives
RRC:	Required Return Curve
USDA:	United States Department of Agriculture

CHAPTER I : INTRODUCTION

1. Thesis Objectives and Structure

This thesis presents a financial analysis of the competitiveness of Italian agricultural cooperative. The purpose is to provide an outlook of the issues for Italian agricultural cooperatives and to address the most relevant problems, such as udercapitalization and decision process efficiency. The uniqueness of this thesis comes from the availability of a new and extensive dataset including financial data for 1691 cooperatives. Also, the thesis applies for the first time analytic tools from the financial theory to Italian agricultural cooperatives.

This thesis is composed of three papers. Although every paper can be read independently, they all discuss topics related to the competitiveness of cooperatives in the food system and compared to other organizations. The first paper, "Alternative Italian Agricultural Cooperative Strategies in the Changing EU Food System," is presented in Chapter 2 and it describes the emerging strategies of Italian agricultural cooperatives through a financial analysis of a 1691 firm sample. The second paper (Chapter 3), "Members' Financial Evaluation and the Efficiency of Cooperatives' Decision Processes," discusses the possibility of an intrinsic competitive disadvantage of the cooperative organization model due to a lower efficiency of the decision process compared to Investor Owned Firms. The study utilizes a financial approach to provide a theoretical model for the decision process in a cooperative. The last paper (Chapter 4), entitled "Effects of Managers' Power on Capital Structure: A Study on Italian Agricultural Cooperatives," applies the theoretical framework to the specific problem of cooperatives' undercapitalization and proposes an

econometric model to give empirical support to the financial model proposed in Chapter 3.

2. The Italian Food System.

Agriculture is still a relevant activity in the Italian economy. In 1996, the Italian agricultural workforce employed 1.3 million units, 6.5% of total civilian employment. In the same year the industry sector employed 32.2% and the service sector employed 61.3%.[1] This percentage has been constantly decreasing: in 1970 agriculture represented 20.2% of Italian civil employment (3.9 million units). Despite this trend, the Italian percent of agricultural employment is still higher than the EU's average (5.0%) and the US (2.6%).

The Italian farm system is characterized by a large number of small farms. In 1996, Eurostat reported 2.5 million Italian agricultural holdings with an average tillable area of 14.57 acres. In the same year, there were 7.4 million holdings with an average tillable area of 43 acres in the EU and 1.9 million holdings with 487 acres in the US. In Italy, 19.6% of the national tillable area is owned by farmers who have an area of less than 12.35 acres (the EU's average is 6.2%).

Table 1.1 summarizes the characteristics of Italian agriculture by comparing selected data with the US and EU. The data stresses the uniqueness of the Italian farm system, especially in terms of the number of agricultural holdings compared to total population.

Also, the table shows that Italy is a net importer of food and agricultural product, with a deficit of US$ 11,591 million.

Table 1.1: Selected Data about Italy, EU and US (1996)

	Italy	EU	US
Population (million)	57	374	272
Area (km^2/000)	301	3,236	9,363
n. of agricultural holdings (/000)	2,482	7,370	1,910
average tillable area (acres)	15	43	487
% of agriculture on total employment	6.5%	5.0%	2.6%
External trade balance in food and agr. prod. (US$/million)	-11,591	-16,304	9,798
% of imports of food and ag. prod. in all imported products	14.2%	10.6%	6.5%
% of exports of food and ag. prod. in all exported products	6.9%	7.6%	10.7%

On the demand side, consumers' expenditure for food in Italy is almost stationary. Table 1.2 shows that, during the 1991-1996 period, real food expenditure has decreased by 1.76%. In the same time period, real non-food expenditure has increased by 3.54%. In those years, the percent of food expenditure on total expenditure decreased from 18.92% to 18.13%

Table 1.2 Final Consumption Expenditure for Italian Families ($billion 1990)[2]

	1991	1992	1993	1994	1995	1996
Food expenditure	89.70	89.98	89.80	89.71	89.27	88.12
Non food expenditure	384.38	389.07	377.56	384.25	393.21	397.98
% of food expenditure on total expenditure	18.92	18.78	19.21	18.93	18.50	18.13

(Source: ISTAT, 1998)

Despite constant food expenditures, the characteristics of food consumption have been changing rapidly in the last 25 years. Economic, demographic, social and cultural

[1] Unless specified, all data in this section are from EU's Commission, Direction General for Agriculture (European Commission, 1998)

factors caused a shift in consumer preferences from a focus on food quantity to a focus on food quality. As a consequence, purchasing patterns and habits were influenced. In the 1985-1996 period, the per-capita consumption of red meat, wine and high-fat products decreased significantly, while the consumption of white meat, fruits and vegetables increased (ISTAT, 1998).

The constant food expenditures and the change in consumer preferences increased the competition in the Italian food market. In order to gain market shares, food firms must provide more value to their customers and increase their efforts to deliver the attributes required by consumers who have become more demanding. This new approach is causing rapid changes in the entire Italian food system.

3. Cooperatives in the Italian Food System.

In Italy, the "cooperative movement" was born at the beginning of the 20th century (Botteri, 1978). Although forms of cooperation in agriculture has been common since the Middle Ages, it was in the early 1900s that the current notion of cooperative enterprise spread across Italy in the form of rural credit and consumers' cooperatives. The new approach was inspired by two opposite ideologies: socialism and the social doctrine of Catholicism. In both cases their objective was to improve the living conditions of Italian farmers, although with different missions. The ideologies of the two groups placed a strong importance on the social role of Italian agricultural cooperatives, stressing the importance of supporting rural income, promoting employment and supporting small

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[2] A conventional $1/Lit. 1750 exchange rate has been used.

farmers facing the dramatic changes of the Italian economy in the early 1900s. During the fascist regime (1922-1943), cooperatives were discouraged because they were considered as competitors of the "corporative" system created by the government in order to manage social conflicts. After World War II Italian agricultural cooperatives developed the current vision, characterized by a strong focus on marketing and food processing activities and conciliating traditional ideologies with more practical economic goals. As a result of this synthesis, cooperatives focused on improving small farmers' living conditions by granting profitable business opportunities through production concentration and the integration of food processing activities.

Table 1.3: Percentage of Agricultural Production Sold through Cooperatives in EU in 1994 (Source: European Commission, Directorate General for Agriculture, 1994)

	Pigmeat	Beef	Poultry meat	Eggs	Milk	Sugar beet	Cereals	Fruit	Veget.
Austria	20	25	70		90	100	60	18	28
Belgium	18	0			53	0	30	75	85
Denmark	91	66	0	52	94	0	60	75	75
Finland	66	65	83	54	97		48		
France	85	30	30	25	47	16	68	40	25
Germany	27	28			52	80	47	40	28
Greece	3	4	15		20		49	57	3
Holland	34	16	9	14	83	63	65	76	73
Ireland	55	17	20		99		57	14	17
Italy	***13***	***12***	***35***	***8***	***40***	***6***	***20***	***43***	***8***
Luxemb.	37	38			81		79		
Spain	7	8	22	25	27	22	20	45	15
Sweden	78	76		33	99		75	20	50
U. K.	28		25		67		24	67	26
Average	*40*	*30*	*31*	*30*	*68*	*36*	*50*	*48*	*36*

Table 1.3 shows the results of this strategy by reporting the percentage of agricultural production marketed by cooperatives in 1994 and comparing it with the other EU countries. Although the Italian shares are lower than the EU's average, cooperatives were

significant market agents in relevant sectors of Italian agriculture, such as fruit, milk and poultry sectors. Moreover, cooperatives marketed 50% of wines and 34% of Italian cheeses.

4. Problem Statement.

During the 1990s, the scenario of Italian agriculture has undergone significant changes. The GATT agreement has brought an increase in the competition in the EU's domestic markets allowing the access of international competitors who previously were kept out by trade barriers of various forms. At the same time, the Common Agricultural Policy (CAP) endured two major reforms implementing a gradual reduction of the public support to agriculture especially in terms of price pegging.[3] These factors, together with the changes in consumer preferences, caused an acceleration of the evolution of the European food system and called for radical innovation in cooperatives' strategies. The industry reacted to the new environment through a concentration process. At first, the mergers and acquisitions concerned the distribution channel, but later the food processing level was involved too (Lanciotti 1997). The concentration process has been so strong that now a significant share of the Italian market is controlled by a small number of multinational companies (De Castro, 1995). In this scenario, small and medium firms, including many cooperatives, are struggling to compete and are forced to reconsider their strategic planning to face the opportunities and threats coming from the evolving market.

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[3] The so called Mac Sharry reform in 1992 and the Agenda 2000 reform in 1998.

The number and the magnitude of cooperative bankruptcies in the mid-90s[4] raised questions about the ability of cooperatives to compete in the new environment and raised the question of whether cooperative have an intrinsic competitive disadvantage in innovative markets (Denicolò, 1995). In this context, this thesis intends to describe the Italian cooperatives' new strategies and to evaluate their adequacy in meeting the changes in the market and the requirement of an industrialized agriculture. The underlying study question is the evaluation of the possibility for Italian cooperatives to be as competitive as other organizations.

[4] The number of cooperative bankruptcies per year almost tripled from 1986 to 1996. Moreover some of them concerned some of the largest cooperative in Italy, particularly in livestock sector (Confcooperative 1997).

CHAPTER II: ALTERNATIVE ITALIAN AGRICULTURAL COOPERATIVESTRATEGIES IN THE CHANGING EU FOOD SYSTEM.

1. Introduction.

The European food system is undergoing significant change driven both by global competitive forces and local conditions. Market globalization and technological innovation are interacting with the reform of EU's agricultural policies (CAP) and a renewed interest by the European society in the social and environmental functions of agriculture. These factors have created a new and challenging economic environment both for farmers and the food industry across Europe (Tarditi, 1997).

The Italian farm system is having difficulty in facing these changes because of the large number of remarkably small units of production. In 1997, the average tillable acreage of the 2.48 million Italian holdings was 14.57 acres versus 43 acres for the 7.37 million holdings in the entire EU and the 487 acres for the 1.91 million US farms (European Commission, 1998). Italy represents 33.7% of the EU holdings but only 10.9% of the total tillable area. In this context, Italian agricultural cooperatives, a traditional link between the producers and the market, are struggling to find new strategies to pursue their mission in a more demanding environment. This issue is critical for the Italian food system because of the importance of cooperatives as transaction agents in the market. A survey showed that, in 1994, 51.8% of Italian farmers used cooperatives to market at least part of their production (Malorgio, 1995). In particular, cooperatives marketed

approximately 50% of Italian wine production, 34% of all cheese and 40% of all raw milk.

The objective of this paper is to describe the strategies that cooperatives are implementing and to provide insight into the possible new roles they can assume in the market. This objective will be realized by analyzing a new dataset containing financial and structural information on approximately 20% of all Italian agricultural cooperatives.[5] The database is one of the most extensive in Italy and it allows for deeper insight into cooperatives' strategies. The study is organized as follows: the sample data are presented through a comparison with the US cooperatives, then a more detailed financial analysis of Italian cooperatives is provided and, lastly, the information is used to describe the current trends in the Italian cooperatives. The data on Italian cooperatives are summarized in table 2.1 and other tables and figures are presented in the text to support the discussion.

2. Background Data.

The 1691 cooperative sample included the financial statements and other structural data. The information refers to fiscal year 1996. Fifty-seven percent of the observations were

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[5]The data on Italian cooperatives reported in tables and figures are courtesy of Confederazione Cooperative Italiane, the most representative Italian cooperative Association. The Authors are particularly thankful to Mr. Vincenzo Mannino and Mr. Luciano Quiriconi for their support.

Table 2.1: Descriptive Statistic of a Sample of 1691 Italian Agricultural Cooperatives

Sectors	N. Coop.	Concentration Ratio of Sample Revenues		Revenues			Total Assets	Workforce	Num. of Members
		5% largest coop.	4 largest coop.	% inciden. of total sample	avg. per coop. ($mil.)	avg. per member ($mil.)[1]	avg. per coop. ($mil.)	avg. per coop. (n.)	avg. per coop. (n.)
	A	B	C	D	E	F	G	H	I
Livestock	202	81.0%	57.2%	9.9%	3.79	0.07	2.11	16	58
Poultry	22	69.0%	83.7%	16.9%	59.43	3.92	15.30	202	22
Services and Farm Sup.	224	67.8%	43.0%	6.0%	2.06	0.04	1.13	3	123
Joint Farming	87	54.8%	54.8%	0.6%	0.51	0.02	0.82	7	31
Fruits and Vegetables	259	51.8%	32.4%	16.6%	4.98	0.06	4.62	22	177
Dairy	460	51.6%	22.6%	29.3%	4.93	0.14	4.10	9	57
Forestry	28	46.5%	66.3%	0.1%	0.20	0.01	0.23	8	52
Wine	241	37.8%	27.3%	15.0%	4.81	0.02	5.46	11	436
Olive Oil	109	37.3%	32.4%	1.0%	0.70	0.00	0.75	4	317
Tobacco	18	28.4%	69.5%	1.4%	6.04	0.09	5.13	29	693
Grain	38	22.4%	36.0%	1.8%	3.72	0.03	2.55	5	350
Sugar and Rice	3	N A	N A	1.5%	38.39	0.03	46.60	114	1039
Sample Totals/Averages	*1,691*	*62.2%*	*20.9%*	*100.0%*	*4.58*	0.12	*3.49*	*14*	*168*

[1] Eighty four federated cooperatives were excluded from the calculation of average revenues per member.

located in the North, 20% in Central and 23% in South Italy. [7]

A sectoral decomposition of the sample is reported in Table 2.1 (column A). The sector breakdown includes some categories that are unique to Italy. Specifically, the services and the farm supply cooperatives are usually considered a single sector, which does not include credit or electric cooperatives. The joint farming sector is composed of cooperatives in which members jointly farm land and benefit from the profit from the sales of products. Lastly, 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. In order to provide a homogeneous comparison, the US cooperatives will be classified according to the Italian standards.

In 1996, the sample of 1,691 Italian cooperatives produced US$7,774 million of revenue using assets worth $5,900 million. [8] They employed more than 23,000 workers and had a total membership of 284,385 patrons. In the same fiscal year, 3,884 American cooperatives generated $128 billion of revenues, utilized $42 billion of assets and employed 174,795 workers. The total American membership was composed of 3,66 million patrons.[9]

In the US, the largest cooperative sector was services and farm supply: it was composed of 1,872 cooperatives (48.2% of total), had approximately 2 million members (54.1% of

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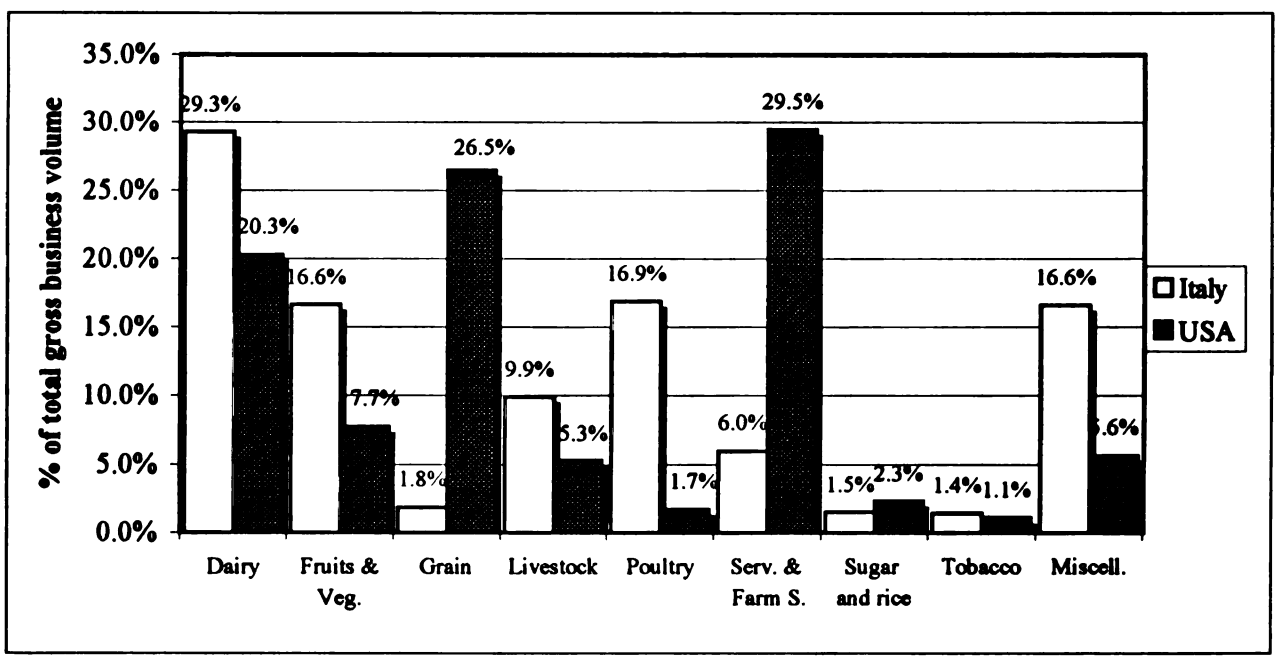
[7] This distribution reflects both the general conditions of the Italian economy and the morphology of the country. Most of Italian enterprises are located in the North, which also contains the most fertile farmland.
[8] In this paper a standard exchange rate 1$ for 1750 Lire is used.
[9] The source for all the data about US cooperatives was the USDA Farmer Cooperative Statistics, 1996.

total) and produced 29.5% of the total revenues. Grain was the most traded commodity by US cooperatives: this sector involved 1,066 cooperatives (27,4% of total), 783,427 members and it produced $34 billion of revenues (26.5% of total). In Italy, dairy, fruit and vegetables and wine were the most representative sectors in terms of total revenues and number of cooperatives (Table 2.1). Figure 2.1 summarizes the differences in the two countries by comparing the percent incidence of the sectors on total revenues. The graph shows the higher incidence of grain and services and farm supply cooperatives in the US, and of poultry and fruit and vegetable cooperatives in Italy.[10] The difference in the composition reflects the characteristics of agriculture in the two countries; a commodity focus in the US versus a focus on the products characteristic of the Mediterranean area (wine, olive oil, fruits and dairy).

Figure 2.1: Percent of Total Revenues by Sector



[10] The Italian miscellaneous group presented a 16.6% value due to the presence of wine cooperatives (15% of total revenues), not explicitly reported by USDA.

The cooperatives of the two countries show remarkable differences in the scale of operation, as reported in table 2.2. The average size of the cooperatives in terms of revenues and number of members shows that the US cooperatives are, on average, larger than the Italian cooperatives. The only exception is the sugar and rice sector, where the average revenues are similar and the number of members is higher in Italy than in the US.

On average, revenue per member is approximately equal in the two countries ($0.03 million). The sector analysis showed relevant differences between the two countries. In dairy, fruit and vegetable, grain and sugar and rice sectors, the US cooperatives reported higher values. In the poultry, livestock and services and farm supplies sectors, the higher average revenue per member seems to imply that the scale of members' operations was larger in Italy than in US.

Table 2.2: Average Revenue per Cooperative, Number of Members and Revenue per Member for Italy and the US

	Revenue ($mil.)		N. of Members		Rev. per Memb. ($mil.)	
	Italy	USA	Italy	USA	Italy	USA
Dairy	4.93	96.77	57	470	0.09	0.21
Fruits and Vegetables	4.98	35.18	177	175	0.03	0.20
Grain	3.72	25.94	350	735	0.01	0.04
Livestock	3.79	75.56	58	3,133	0.07	0.02
Poultry	59.43	109.63	22	2,020	2.70	0.05
Services & Farm Supply	2.06	14.29	123	1,058	0.02	0.01
Sugar and Rice	38.39	41.66	1,039	392	0.04	0.11
Tobacco	6.04	54.31	693	10,257	0.01	0.01
Miscellaneous	4.81	27.66	309	561	0.02	0.05
Average	*4.58*	*27.34*	*168*	*943*	*0.03*	*0.03*

Table 2.3 reports the values of the equity/asset ratio and the total asset turnover by sector for the two countries. The total asset turnover was significantly higher in the US,

especially in the livestock and dairy sectors, implying a possible lower efficiency of Italian cooperatives in managing their assets. Compared with the US, the Italian cooperatives were more leveraged on average. The average equity/asset ratio for Italian cooperatives was 0.2 showing that debt was the most common source for financing and confirming the importance of the undercapitalization problem in Italian cooperatives (Williams, 1996). The sector decomposition showed that dairy and poultry were the least capitalized sectors, while tobacco and sugar and rice presented higher index values. In the Italian sample, the total asset turnover ratio was significantly higher in poultry, while sugar and rice and services and farm supply had values below unity.

Table 2.3: Average Equity/Asset Ratio and Total Asset Turnover in Italy and the US

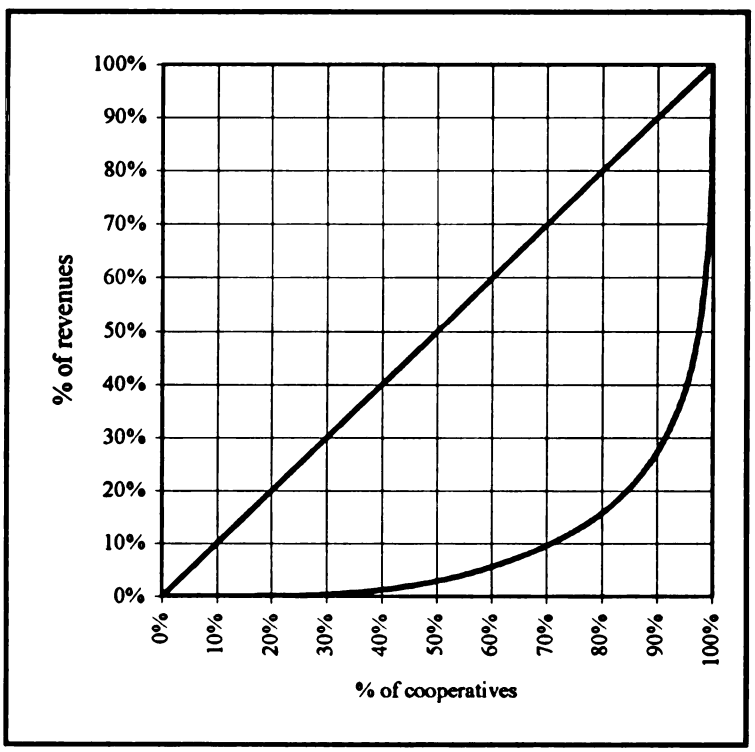
	Equity/Asset Ratio		Total Asset Turnover	
	Italy	USA	Italy	USA
Dairy	0.1	0.4	1.1	4.4
Fruits and Vegetables	0.2	0.3	1.0	1.8
Grain	0.2	0.4	1.4	4.0
Livestock	0.2	0.3	1.7	11.9
Poultry	0.1	0.3	3.9	1.6
Serv. & Farm Sup.	0.3	0.6	1.8	5.8
Sugar and Rice	0.5	0.4	0.7	2.0
Tobacco	0.4	0.6	0.6	1.6

The data presented in this section illustrates significant differences between the Italian and American cooperatives both in terms of size and financial structure. Particularly, the small size and the undercapitalization of Italian cooperatives seemed to prevent them from achieving a higher efficiency. The industrialization process of Italian cooperatives appears to be slower compared with the US. The following sections elaborate on these conclusions through a more extensive financial analysis of the Italian cooperatives and a description of their strategic trends.

3. Financial Analysis of Italian Cooperatives.

The revenue concentration was one of the most important characteristics of the sample. Table 2.1 (columns B and C) reports two sector concentration ratios measuring the percentage of revenues produced by the top 5% and by the four largest cooperatives. The index values were 62.2% and 20.9% respectively, confirming that a relatively small number of cooperatives produced most of the revenues. In support of this conclusion, the Lorenz curve for revenue distribution is reported in Figure 2.2. The graph shows that 90% of the cooperatives produced only 27% of the revenues. The sample data suggests a remarkable gap between a large number of small cooperatives and few, larger enterprises that controlled most of the revenues.

Figure 2.2: Lorenz Curve for Revenue Distribution for Italian Cooperatives



The revenue concentration varied across sectors significantly (table 2.1, columns B and C). The data showed that the most concentrated sector was poultry, in which the four largest cooperatives produced 84.7% of the revenue. In livestock and services and farm supply sectors, the top 5% of the cooperatives produced more than two thirds of the total revenues. The least concentrated sectors were grain, tobacco, olive oil and wine.

Columns E, G, H, I of table 2.1 report the average revenues, assets, workforce and members per cooperative pointing out the differences in the scale of the operations. Particularly, poultry and sugar and rice cooperatives were significantly above the average, while joint farming, forestry and olive oil enterprises were representative of small scale operations. In terms of the percentage of the total sample revenues (column D), dairy, poultry, fruit and vegetable and wine cooperatives presented the highest values, stressing the focus on traditional Italian products. Olive oil cooperatives, even though their number was large, represented only 1% of total revenues because of their small average size.

The average revenues per member give insight into the member-cooperative interaction (column F of table 2.1). The values can be considered proxies of the impact the cooperative had on the members' farm revenues: higher revenues per member imply that, after having covered the cooperative production costs, more resources should be available to be transferred to each member. The data reveals that poultry and dairy cooperatives had high average revenues per member versus olive oil, wine, joint farming, forestry and the grain sector. The latter sectors presented the lowest average values suggesting that the

cooperative's effect on members' income was minimal. In these sectors, considering the high cooperative and farm production costs, the available income for the farmer is, on average, marginal. This implies that membership of the cooperatives was composed mostly of part time or highly diversified farmers and suggests the influence of non-economic factors on the participation in the enterprise. For example, this is the case of many olive oil cooperatives, which squeeze olives mostly for patrons' self consumption and members participate more because of the higher quality of the product than due to the profits.

Figure 2.3: Distribution of Cooperatives by Classes of Average Revenues per Member

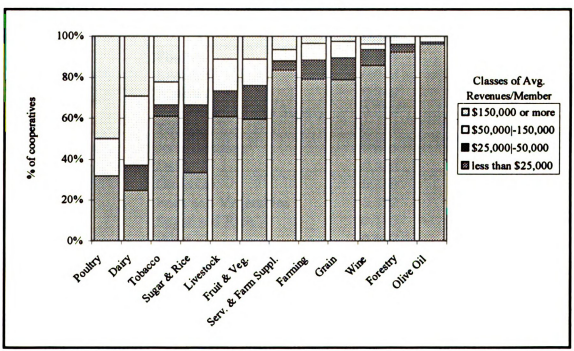


Figure 2.3 integrates the information provided in table 2.1. The figure illustrates the differences in the member-cooperative relationships by providing the percent distribution

of the cooperatives by sector and the class of average revenues per member.[11] The data stressed the dichotomy between two organizational structures. The first structure is prevalent in wine and olive oil sectors. These cooperatives on average had a high average number of members (317 and 436, respectively), low average revenues per member and a remarkably fragmented membership. These characteristics suggested a weak complementarity between the members and the cooperative. The second organizational structure, which was widely implemented in the poultry and dairy sectors, had a low average number of members, a stronger complementarity with a more intense interaction with the cooperative.

Table 2.4: Correlation between Cooperative Revenues and per Member Average Revenues[12]

Sector	Correlation Index
Poultry	0.995
Livestock	0.944
Forestry	0.848
Services and Farm Supply	0.738
Tobacco	0.634
Joint Farming	0.631
Dairy	0.539
Olive Oil	0.358
Fruit and Vegetables	0.322
Sugar and Rice	0.110
Wine	0.037
Grain	-0.063

[11] Eighty four federated cooperatives were excluded from the calculation. The figure reports the percentage of cooperatives in the sector falling in one of the four classes of average revenues per member, because of the uniqueness of the member-cooperative relationship due to the fact that federated cooperatives' members are cooperatives. For example, in the poultry sector, 50% of cooperatives had an average revenues per member of $150000 or more, approximately 20% presented a value between $50,000 and 150,000 and finally 30% had average revenues per member lower than $25,000.

[12] Eighty four federated cooperatives were excluded from the calculation.

To further investigate and support the previous results, linear correlation indexes were calculated between cooperative's revenues and average per member revenues (table 2.4). There was almost a perfect positive correlation for poultry and the livestock sectors. In these industries, the size of the cooperative was closely linked with the average business volume with members. This implies a growth strategy for the cooperative focused on building stronger links with fewer members with larger operations. In other sectors, such as grain and wine, the two values are uncorrelated, implying a growth strategy for the cooperative based on building a large membership consisting mostly of small producers (as shown by the low average revenues per member). This dichotomy is one of the most important results of the analysis and it highlights a basic difference in the role of Italian cooperatives. Some cooperatives acted in the market as a vertical coordination tool for large and professional producers, while others were focused on processing and marketing the production of a large numbers of small and, in most cases, part-time producers.

The background data illustrated that Italian agricultural cooperatives were remarkably diverse. In the next section this information will be used to identify the strategic trends for these cooperatives.

4. Current Trends in Italian Cooperatives.

The data presented in the previous sections are consistent with three major trends observed in the Italian agricultural cooperatives. The first trend, predominant in the olive oil, forestry and joint farming sectors, is concerned with the needs of local communities and has lower emphasis on the production of direct financial benefits for the members. The cooperatives pursuing this strategy are characterized by having a minimal impact on

the members' income. However, these cooperatives play a significant role for the social fiber of the Italian rural communities. They are small and specifically adapted to serving the needs of the local community. These cooperatives appeared to be focused on particular aspects of social demand (such as landscaping, environmental services or production of traditional food). The most important characteristic is the intense tie with the local community, confirmed by strong support either through a large membership or concessions of public land for private benefit. This strategy actually reflects the notion of "multifunctional agriculture" strongly promoted by the renewed EU's Common Agricultural Policy (CAP). A typical example of this approach is given by the forestry cooperatives. Local authorities are willing to give public land for private enterprise use in order to support the socio-economic activity. In exchange, the local communities benefit from the positive externalities produced by the cooperatives (landscaping, eco-tourism, etc.).

The second trend is characterized by the aggregation of a large number of members in a market oriented activity. The membership of these cooperatives is composed of small producers (in most cases part-time farmers) whose primary activity is usually not directly related to the cooperative. The emphasis of this model is on supporting small farm operations. The relevance of these cooperatives came from their ability to process and market the production of a large number of farmers who otherwise would not be able to act effectively in the market. The action of these cooperatives presents remarkable synergies with the EU's policies in support of rural income. Small farmers, using cooperatives and receiving public financial support, are able to avoid significant

economic losses that could force them to sell their farmland and quit farming. These cooperatives were predominant in the wine and grain sectors because of the relatively lower minimum efficient scale of production of these commodities.

Finally, the third trend was characterized by an emphasis on the production of profits for professional farmers. The cooperative scale of operations varied from small enterprises, characterized by strategies of product differentiation, to large, industrialized firms. The main characteristic of these cooperatives is the high value of the average revenues per member usually related to the presence of professional farmers who have large scale operations. These cooperatives were predominant in the poultry sectors and had a significant presence in dairy, fruit and vegetables, tobacco and livestock sectors.

5. Summary and Need for Future Research.

The analysis presented in this paper showed that the Italian cooperatives are reacting to the change in the food market by implementing three strategies: 1) focus on the relationships with the local community, 2) focus on the market, 3) focus on supporting small farmers. The former stresses a social role of the cooperatives, the second is oriented to the economic return for the members, while, in the third, the profit goal is integrated with social objectives such as supporting small farmers. These trends reflect the different aspects of the European social demand for agricultural services, making cooperatives able to pursue the multiple objectives characterizing the European model of agriculture recently described by the CAP (European Commission, 1998). Cooperatives proved to be an effective component of the food system and, at the same time, able to contribute to

rural development and the preservation of the environment. From this point of view, the ability of Italian cooperatives to attract a large membership of small producers is particularly valuable, allowing many farmer to run their enterprises effectively even in the absence of economies of scale at the farm level and preserving the farm income of rural areas. At the same time, Italian cooperatives proved to be efficient organizations for professional farmers, able to manage the complexity of industrialized agriculture.

The characteristics of the EU's social demand for agricultural services may explain some of the differences between Italian and US cooperatives. The American enterprises were primarily focused on food production, while Italian cooperatives pursued multiple objectives not always directly related to the food system. The broader set of objectives can be considered one of the causes of the slower industrialization process in the Italian sample.

Finally, the survey presented in this paper proposed several issues for further research. The analysis of a single years data set does not allow us to extrapolate the dynamics of the new trends and prevents forecasting of future scenarios. Also, the data stressed the relevance of the member-cooperative relations in the determination of the emerging strategies. A formal analysis model of the influence of the characteristic of the membership on the cooperative decision process could prove useful for the understanding of their economic behavior.

CHAPTER III: MEMBERS' FINANCIAL EVALUATION AND THE EFFICIENCY OF COOPERATIVES' DECISION PROCESSES

1. Introduction.

The paper presents an analysis of cooperative investment decision based on the coalition theoretical framework (Staatz 1983, 1987, 1989). According to this framework, cooperatives can be considered as coalitions of groups with different interests. The behavior of any cooperative is determined by the interaction of its many groups (different types of farmers, managers, lenders, input suppliers, buyers, etc.) with different objectives. The group that can impose its will on the coalition will determine the cooperative's strategy. The other parties may accept this leadership, leave the cooperative or try to use their bargaining power to modify the final outcome.

The paper discusses the impact of group bargaining on cooperatives' decision process. In particular, the paper addresses the issues related to the consequences of members' heterogeneity on cooperative efficiency. The proposed model utilizes tools from financial theory already successfully applied in the literature (Peterson 1992, Hendrikse 1998) providing a more detailed insight into the determinants of the cooperative decision process. The paper shows that cooperatives evaluate investments differently from IOFs due to the unique characteristics of their patrons compared to other types of investors. These characteristics raise the transaction costs of the cooperative decision process making internal coordination more difficult. The point will be shown through the following process:

1. A model is set up by determining the assumptions and identifying the studied investment decision. (Section 2)
2. The cooperative members' evaluation criterion is described. (Sections 3 and 5)
3. This criterion is compared with IOF shareholders'. (Section 4)
4. The implications of the differences are analyzed. (Section 6)

2. The Model.

The model describes members' behavior and the cooperative decision process by imposing the following assumptions to a general net present value (NPV) approach (Brealey and Myers 1996):

1. *Members' objectives.* Members' goal is the maximization of the Net Present Value (NPV_i) of their personal investment in the cooperative.
2. *Independent evaluation of investment projects.* Each member evaluates each investment project independently. This assumption postulates that a member' evaluation is not influenced neither by the other members or other investment opportunities.
3. *Exit option.* If the cooperative accepts an investment so that $NPV_i < -q_i$, the member will abandon the cooperative. In the equation, NPV_i is the net present value of the member's investment in the cooperative and q_i is the quasi rent value of the member's assets. The quasi-rent value is defined as the difference between the value of the member's assets if used in the transaction with the cooperative and the their value if used in the next best transaction. Thus, the quasi-rent value can be expressed as the loss in wealth that the member would incur if he/she left the cooperative. If $-q_i < NPV$

< 0, the member will not support the project (for example, he/she might vote contrary) but he/she will not leave the cooperative.

4. *Open membership.* Any producer can become a cooperative member simply by paying an equity share at face value. Although additional costs may be charged to members to finance cooperatives' investments, membership is achieved simply by paying an equity share at nominal value. As a consequence, members leaving the cooperative can only have back their investment at face value because they cannot sell the share on the market at a higher price.
5. *All costs and benefits received or allocated by the cooperative can be expressed in economic values.*
6. *Restriction on cost and benefit allocation rules.* Cost and benefit may be allocated among the cooperative groups only according to two non mutually exclusive criteria: either proportionally to equity share or proportionally to patronage.[13]
7. *Separation of the farm production decisions.* The evaluation of the cooperative's investments does not affect the members' production decision for their farm. This assumes that farmers would produce the same goods even if they were not cooperative members and it implies the existence of alternative marketing channel for patrons' products. Also, this assumption postulates that the cooperative investment requires no intermediate investment because members are not required to adjust their production to invest in the cooperative. This assumption, together with the definition of total value, allows us to focus the analysis on the pure financial decision of the cooperative investment.

8. *No option value of the investment.* The farmers do not gain any value by postponing the investment. This assumption postulates that the benefits of waiting (i.e. avoiding a possible loss) are offset by the costs (i.e. the missed cash flows).
9. *No taxation.* The cooperative profits are assumed tax-free.
10. *No bankruptcy.* The possibility of bankruptcy is not considered in the model.

Now, assume that the cooperative is considering an investment with the characteristics summarized in equation [1]. The study question is to determine if the cooperative should accept the project, assuming that the cooperative goal is the maximization of members' wealth.

$$NPV_C = \sum_{t=1}^{N} \frac{M_t}{(1+k_c)^t} - E_0 > 0. \quad [1]$$ [14]

where:

NPV_C is the net present value of the investment calculated according a standard CAPM technique.

N is the horizon of the investment;

M_t represents the "total value" produced by the cooperative in the year t. The "total value" is the sum of all the benefits produced by the cooperative to the members

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[13] This assumption is consistent with the current cooperative regulation in many countries: cooperatives' dividends are allowed even if uncommon.

[14] In order to provide a homogeneous comparison with the following equations, the formula [1] expresses the NPV of the members' equity investment. The formula is equivalent to the more traditional formulation of the NPV of an investment: $\sum_{t=1}^{N} \frac{R_t}{(1+k_w)^t} - I$, where k_w is the interest rate calculated according to the Weighted Average Cost of Capital technique, R_t is the sum of the total value produced by the cooperative (M_t) and the interest expenses and I is the total cost of the project including debts. The equation [1] takes into account the effect of the leverage through the evaluation process of the interest rate k_c.

plus the cooperative net income (Staatz 1989). It may include price differentials, services, cooperative profits, patronage or income retention, etc.

E_0 is the value of equity required by the investment;

k_c represents the interest rate to be used in the discount process. k_c is calculated according the usual Capital Asset Price Model (CAPM) formula: $k_c = k_0+(k_m-k_0)\beta_L$, where k_0 is the return of the risk free assets, k_m is the return of the market portfolio and β_L is the beta coefficient for the cooperative, given the specific leverage level[15] (Sharpe 1964, Lintner 1965). It must be pointed out that, according to the CAPM framework, k_c is independent from members' preferences.

Financial theory states that, under the condition of fully diversified investors, the project described in equation [1] should be accepted because it maximizes the value of the present wealth of the investors (Brealey and Myers 1996). In this paper, the proposed financial model will show that this rule does not hold for cooperatives. Actually, in these organizations, the members' wealth maximization is achieved through different decision criteria. To prove this point, section 3 describes the evaluation process of the project from the members' point of view.

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[15] According the CAPM the beta coefficient value is given by the formula: $\frac{cov_{t-1}(y_t^m, y_t^c)}{var_{t-1}(y_t^m)}$ i.e. the expected covariance of the return of the market portfolio and the cooperative returns, divided by the expected variance of the market portfolio.

3. Cooperative Members' Investment Evaluation Criteria

Given the hypothesis of the model, the evaluation of the i^{th} member of the investment project described in equation [1] can be model by equation [2]. The equation illustrates the decision process of a farmer who is already a member of the cooperative and must decide if he/she should support the initiative or not. As assumed, the member will support the project if $NPV_i>0$, will oppose the project if $NPV_i<0$ (he/she will vote contrary) and will leave the cooperative only if $NPV_i<-q_i$ (the quasi-rent value of the investments).

$$NPV_i = \sum_{t=1}^{H_i} \frac{w_t s_i M_t + (1-w_t) p_{it} M_t}{(1+k_i)^t} - \left(1 - \frac{1}{(1+k_0)^{H_i}}\right)\left[w_{t_0} s_i E_0 + (1-w_{t_0}) p_{it_0} E_0\right] \quad [2]$$

in which the present value of the cash flows obtained by the member (represented by the summation value) is compared with the value of the required individual equity investment. Specifically:

$w_t s_i M_t + (1-w_t) p_{it} M_t$ represents the total cash flows obtained by the member in the year t. The value is calculate by multiplying the total value produced by the cooperative (M_t) by a series of parameters representing the rules for benefit allocation and the individual characteristics of the member. In particular:

- w_t is the share of total value allocated among members in proportion to the equity share in the year t,
- s_i is the equity share of the i^{th} member (constant across time by assumption).
- $1-w_t$ is the share of total value allocated among members in proportion to patronage in year t,
- p_{it} is the share of total patronage delivered by the member in year t.

H_i represent the temporal horizon for the member, with H_i=min (investment horizon N, number of years the member expects to be patron of the cooperative),

$w_{t_0}s_iE_0+(1-w_{t_0})p_{it_0}E_0$ is the member's initial equity investment: the w_{t0} percentage of the cost of the investment (E) is allocated among the members in proportion to the equity share (s_i), while the remaining $(1-w_{t_0})$ percentage is allocated in proportion to the patronage at year 0 (p_{it_0}),

$\frac{w_{t0}s_iE_0+(1-w_{t0})p_{it_0}E_0}{(1+k_0)^{Hi}}$ is the present value of the equity investment that the member receives back at the moment he/she leaves the cooperative ($t = H_i$). The value is discounted at the risk free rate, given the no bankruptcy assumption.

k_i represent the interest rate used by the member in his/her decision process. The formal evaluation of the coefficient is discussed in section 5. For now, it is sufficient to state that it is determined by the members' preferences and it may be different from k_c.

Equation [2] describes individual members' evaluation of the cooperative project. It results in two important preliminary conclusions. First, individual patrons can have different evaluations of the investment: a project acceptable for the i^{th} member is not necessarily acceptable for the j^{th} member ($NPV_i \neq NPV_j$; with $i \neq j$.). Second, in a cooperative, an investment with the characteristics described in equation [1] is not necessarily acceptable for every member. ($NPV_C>0$ does not imply that $NPV_i>0$ or $NPV_i>-q_i$).

These results are determined by three factors:

- Difference in the investment horizons ($H_i < N$ and, also, H_i not necessarily equal to H_j, with $i \neq j$). Members may plan to stop patronizing the cooperative in different times

and possibly before year N. In this case, members may oppose a positive NPV project if they do not plan to patronize the cooperative for a time period sufficient to gain enough returns from the investment to cover the initial expenses (Vitaliano, 1983). This issue is a direct consequence of the open membership of the cooperative. The absence of secondary markets for cooperative shares consequential to the application of this principle prevents member from recovering the present value of the future cash flows through the share selling price;

- Multiplicity of rules for cost and benefit allocation. Combination of p_{it}, s_i, w_t, and p_{t_0}, such that the member bears a share of cost greater than his/her benefit share. The equation shows that members consider the dynamics of the personal interaction with the cooperative in the evaluation process, which usually differs across patrons. Specifically, members that plan to increase their share of patronage (p_{it}) over time should be more favorable to the investment, while members that plan to reduce their patronage are more likely to have a negative evaluation. Base capital plans usually are able to manage this problem and they can be included in the model by imposing specific relations between the parameters p_{it}, s_i, w_t, and p_{t_0}.
- Diversity in the opportunity cost of money for members ($k_i \neq k_j \neq k_c$). Members may apply different interest rates in their individual investment evaluation. This condition will be formally discussed in section 5.

4. Comparison with IOF Shareholders' Evaluation Criteria.

In a cooperative, members may have different evaluations and their appraisal of the investment may diverge from the classical NPV rule presented in equation [1]. Instead,

shareholders of IOFs are expected to have more consistent evaluations. This statement can be supported as follows. From the formula [2], assuming that $w_t = w_{t0} = 1$ (all the value is distributed in proportion to equity shares owned) and that the shareholders leaving the IOFs receive a market price V_H for their shares, we have the following equation representing the evaluation of the investment for the s^{th} shareholder of an IOF:

$$NPV_s = \sum_{t=1}^{H_s} \frac{M_t s_s}{(1+k_s)^t} + \frac{V_H}{(1+k_s)^{H_s}} - s_s E \qquad [3]$$

Where V_H is the salvage value of the investment at time H_s, M_t is the total additional value produced for the owners by the firm and k_s is the interest rate determined according the standard CAPM method.

Under the assumption that the market price for the equity share at time H_s is based on the NPV of the expected cash flows of the investment $\left(V_H = \sum_{g=1}^{N-H_s} \frac{M_t s_s}{(1+k_s)^g} \right)$, we have that:

$$NPV_c > 0 \Rightarrow NPV_s > 0 \quad \forall s \qquad [4a]$$

$$\text{and} \quad \frac{NPV_z}{s_z} = \frac{NPV_s}{s_s} \quad \forall s, z \qquad [4b]$$

The equations [4a] and [4b] show that, in a IOF, under the condition of fully diversified investors, the general NPV rule leads to the maximization of the present value of each shareholder's wealth. Then, shareholders' evaluations are expected to be consistent with each other and with the general NPV rule.

In other words, if equation [1] holds for the firm, it holds for each individual IOF investor. No bargaining process among investors is necessary in investment decision making. This is not true for a cooperative. Equation [1] vs. equation [2] implies that the

cooperative decision process is expected to have higher transaction costs because of the divergent evaluations of the members. In a cooperative, a bargaining activity is necessary among the members in order to choose the proper course of action and to determine possible compensation for members with divergent evaluations. This process is superfluous in the IOFs, given the homogeneity of shareholders' evaluations.

The consequences of this point will be fully analyzed in section 6, but first the factors influencing the determination of the discount rate for cooperative members will be discussed. In fact, the results achieved in this section assumed that the interest rate applied by cooperative members in their evaluation is influenced by individual preferences. The next section provides the formal derivation of this statement and discusses some of the implications.

5. Members' Required Returns and Cooperative Investment Evaluation

The determination of the interest rate used by members in their decision process may be derived from the "fundamental equation for asset evaluation" (Constantinides, 1989) which states:

$$E_{t-1}\left(y_t^c\right) = \frac{-E_{t-1}\left[U''(W_t)\right]}{E_{t-1}\left[U'(W_t)\right]} \operatorname{cov}_{t-1}\left(W_t, y_t^c\right) \qquad [5]$$

where:

E_{t-1} is an operator representing the expectation conditional on information available at t-1

y^c_t represent the risk premium on the evaluated asset c

U' and U" are the first and second derivatives of a concave utility function

cov_{t-1} is the covariance operator conditional on information available at t-1

W_t is the investor wealth.

Assuming that the investor owns the market portfolio,[16] the equation [5] leads to the CAPM determination of the interest rate used in equation [1]. However, Murray (1983) and Condon and Vitaliano (1983) argued that patrons of cooperative are unlikely to have a diversified portfolio given the relevance of their farm investments. Hanson and Myers (1995) stressed that farmers usually "do not hold diversified portfolios, preferring to concentrate most of their assets in on-farm investments and less risky financial investments such as treasury bonds and certificates of deposit." Given these studies, the market portfolio hypothesis appears not applicable to cooperative patrons and a limited portfolio approach is required. Then, assuming that the patrons' investment portfolio includes only the farm operation, the participation in the cooperative and risk free assets, we have that:

$$cov_{t-1}(W_t, y^c_t) = x^f_{t-1}\, cov_{t-1}(y^f_t, y^c_t) + x^c_{t-1}\, var_{t-1}(y^c_t)\ .^{17} \qquad [6]$$

where y^f_t is the risk premium for the farm operation and x^f_{t-1} and x^c_{t-1} is the investment share in the farm operation and in the cooperative, respectively. Then by substituting the

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[16] The market portfolio is a combination of asset so diversified that the specific risk of the single investment does not influence the variance of the total returns of the portfolio.

[17] Formula [6] can be derived according the following procedure:

$W_t = r^f_{t-1}\, x^f_{t-1} + r^c_{t-1}\, x^c_{t-1} + r^0(1 - x^f_{t-1} - x^c_{t-1})$

$cov_{t-1}(W_t, y^c_t) =$

$$E_{t-1}\left\{ \left[r^f_{t-1}\, x^f_{t-1} + r^c_{t-1}\, x^c_{t-1} + r^0(1 - x^f_{t-1} - x^c_{t-1}) - \bar{r}^f_{t-1}\, x^f_{t-1} - \bar{r}^c_{t-1}\, x^c_{t-1} - r^0(1 - x^f_{t-1} - x^c_{t-1}) \right] \left(y^c_{t-1} - \bar{y}^c_{t-1} \right) \right\}$$

remembering that $y^a = r^a - r^0$ and that r^0 is constant (being risk-free), we have:

$$cov_{t-1}(W_t, y^c_t) = E_{t-1}\left\{ \left[\left(y^f_{t-1} x^f_{t-1} - \bar{y}^f_{t-1} x^f_{t-1} \right) + \left(y^c_{t-1} x^c_{t-1} - \bar{y}^c_{t-1} x^c_{t-1} \right) \right] \left(y^c_{t-1} - \bar{y}^c_{t-1} \right) \right\} =$$

$$x^f_{t-1} cov_{t-1}\left(y^f_{t-1}, y^c_{t-1} \right) + x^c_{t-1} var_{t-1}\left(y^c_{t-1} \right).$$

equation [6] into the [5] it is possible to derive the expected return for the member's participation in the cooperative.

$$E_{t-1}(y^c_t) = \frac{-E_{t-1}[U''(W_t)]}{E_{t-1}[U'(W_t)]}\left[x^f_{t-1}\mathrm{cov}_{t-1}(y^f_{t-1}, y^c_{t-1}) + x^c_{t-1}\mathrm{var}_{t-1}(y^c_{t-1})\right] \qquad [7]$$

Then, k_i used in equation [2] can be defined as $k_0+E_{t-1}(y^c_t)$ and it represent the return of the investment required by the i^{th} member, conditional to the a priori information about the project (i.e. available at time=t-1),[18] The result is consistent with the financial literature about required returns in presence of non diversifiable assets (Mather, 1972).

The equation stresses the two main strategies a cooperative may implement to produce benefits for the members: creation of differential returns and risk management (Peterson and Anderson 1996). The dichotomy is pointed out by the fact that a member, for a given level of risk aversion, will accept lower differential returns if they are negatively correlated with the farm returns, reducing the overall risk level of the patron's operations.

The formula shows that required return of the cooperative investment for a patron with a limited portfolio depends on:

- the share of the personal wealth invested in each asset (x^f_{t-1}, x^c_{t-1} and implicitly $x^0_{t-1} = 1 - x^f_{t-1} - x^c_{t-1}$)
- the expected variance of the cooperative returns
- the expected covariance between the cooperative and the farm operation returns

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[18] In the formula [2] is implicitly assumed constant across time, however the formula [7] shows that that the model allows for a variable interest rate, given the variability of the farmers' portfolio, of their preference and of the value of the risk-free interest rate.

- the relative risk aversion of the farmer represented by the coefficient $\frac{-E_{t-1}[U''(W_t)]}{E_{t-1}[U'(W_t)]}$.

The required return from the cooperative participation depends on individual and personal preferences of the members and the characteristics of his/her farm. In the coalition framework, this implies the possibilities of different groups within the members characterized by different evaluations of the project due to differences in the applied interest rate.

6. Consequences for the Cooperative's Investment Decisions.

The heterogeneity of the required returns for members has major implications in the decision processes of cooperatives. In fact, given the differences between the members' required returns, an acceptable investment should be able to grant at least the following return, which represent the average of members' individual required returns weighted with their percent claim on the total value produced by the cooperative:

$$k_w = \sum_{i=1}^{T} \alpha_i k_i \qquad [8]$$

where T is the number of members; α_i is the percent share of total value that a member can claim.[19] Then, k_w is the required return for a cooperative investment. However, the application of the formula [8] in the decision processes is subjected to two conditions. First, information regarding members' farm characteristics and their preferences (risk

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[19] Equation [8] implies that, in each year, $\alpha_i\, k_i M_t = w_t\, s_i\, M_t + (1-w_t)\, p_{it}\, M_t$. Then, the interest rate to be used in cooperatives' investment evaluation is expected to vary across time non only because of the possible change in the risk-free returns and in the market risk premium but also because of the changes in the dynamics of the relationships between members and the cooperative.

aversion) must be known. Second, the cooperative must be able to discriminate perfectly in the remuneration of patronage. In fact, equation [8] assumes that the cooperative could give to each member exactly the individual minimum required return (k_i). If the cooperative cannot discriminate then the members with higher risk aversion or higher covariance between the farm and the cooperative returns will receive a lower surplus or will suffer a deficit.[20] A cooperative not able to discriminate has to adopt a fixed interest rate k^* such as that a target percentage of member will be satisfied. For example, if the goal is to satisfy of all patrons then $k^* = \max(k_i)$.

The concept can be graphically illustrated through the notion of the required return curve (RRC) which is determined by calculating the return of the investment able to satisfy the target percentage of members in a non discriminating cooperative. Given equation [5], the shape of the RRC is determined by each member's risk aversion, portfolio composition and covariance between the returns of the farm and the cooperative. The figure 3.1 illustrates two examples of RRC in the case of non discriminating cooperatives. In figure 3.1, k_c represents the internal rate of return (IRR) of the cooperative's investment described in equation [1], $k^*(50\%)$ is the return able to satisfy at least 50% of the members. Assuming democratic rules in the cooperative (one vote for each member and equidistribution of the contractual power), we have that an investment will be approved by the members if it grants a return higher than $k^*(50\%)$. It must be pointed out that the return on investment must be adjusted to take into account the

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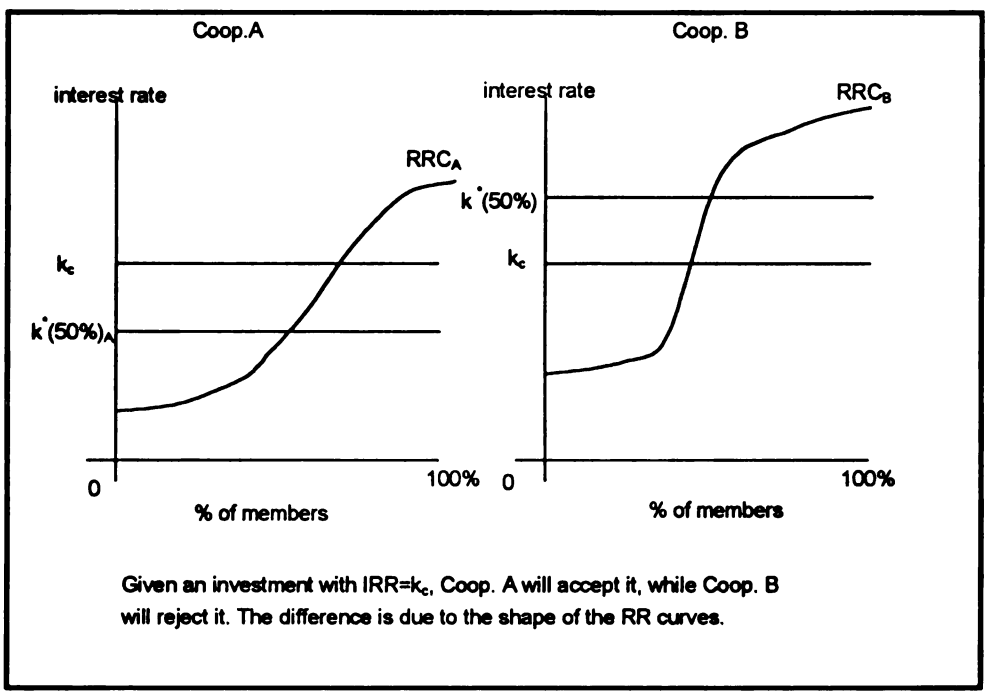
[20] Given the assumption, in the worst scenario the loss will be equal to q_i, the quasi-rent value of their assets; in fact, if the loss should be greater than qi the member will leave the cooperative.

possible exit of members due to losses higher than the quasi rent value of the assets, in the case the project is approved.

Figure 3.1: Influence of the Members' Required Returns on the Cooperative's Investment Decisions



According to formula [7], members of cooperative A may be characterized by low risk aversion, low covariance of farm and cooperative returns, high incidence of the risk free asset in the farmers' portfolio. In this case, the cooperative may accept investments that present a negative value according to the general NPV rule if their returns are actually higher than $k^*(50\%)A$.[21] On the contrary, cooperative B (where members may have high risk aversion, high covariance of farm and cooperative returns, low incidence of the risk

free asset in the farmers' portfolio) may reject investments even if they are acceptable according to the general NPV rule.

In a non-perfectly discriminating cooperative, the difference between the expected return of the investment and the return required by the member represents the member's surplus or deficit. This implies that every project with a return lower than $\max(k_i)$ causes a transfer of wealth between members. Thus, in a cooperative, the adoption of an efficient investment is not necessarily a Pareto-efficient strategy. In order to avoid a Pareto-inefficient solution, two conditions must be respected. First, financial compensation across members must be possible; second the sum of individual surpluses for members must be at least equal to the sum of individual deficits plus the transaction costs originated by the process of determining and paying the necessary compensations. According to the proposed model, a cooperative's strategy may be Pareto-efficient if it grants a return k_e able to satisfy each member and cover the cost of the negotiation and compensation processes, i.e. :

$$k_e \geq k_w + \delta \qquad [9]$$

where k_e is the minimum return for a Pareto efficient strategy, k_w is the required return for a perfectly discriminating cooperative (equation [8]) and δ is the increase in the required returns due to the transaction costs in the compensation process.

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[21] A project with a negative NPV actually grants a lower return than k_c. However, if the return is higher than $k^*(50\%)A$, member will approve the project even if it does not meet the general NPV rule (i.e. the market grants higher returns for the same risk level).

Finally, it must be pointed out that the actual investment decision of the cooperative depends also on the distribution of the negotiation power across members.[22] In fact, according to democratic rules, a project should be approved or rejected if its Internal Rate of Return (IRR) is higher or lower than $k^*(50\%)$. However, the effective negotiation power of minorities can determine the nature of the compensation and the value of δ. If the IRR of the project is lower than k_e, then full compensation is not possible and the strategy of the cooperative is determined by the distribution of negotiation power within the members.

Table 3.1 summarizes the results of the model. The two matrices report the outcomes of the decision processes in the case that the expected return of the investment is able to satisfy the majority of members (matrix A, IRR> $k^*(50\%)$) and in the case that only a minority of members is satisfied (matrix B, IRR< $k^*(50\%)$). In the two situations, the minorities have different interests. In case A, the minority is represented by the members with the higher required returns who have interest in rejecting the project. In case B, the minority is represented by the members with the lower required returns who may want to approve the investment. The matrices show that the investment decisions change according to the distribution of the negotiation power depending also on the returns offered by the project.

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[22] For the purpose of this analysis, negotiation power is defined as the ability of a group to impose their preferences on the whole coalition using any means, for example majority of votes in the meetings, control of the managers and board of directors, control of the marketing channels, threat of exit, etc.

Table 3.1: Cooperative Decision Matrices

Matrix A: Decision Matrix for a Cooperative Investment With IRR> k^*(50%)

		negotiation power of minorities (members with higher required returns)	
		weak	strong[23]
IRR of the project	IRR<k_e	project approved, no compensation	project rejected
	IRR>k_e	project approved, no compensation	project approved with compensation

Matrix B: Decision Matrix for a Cooperative Investment With IRR< k^*(50%)

		negotiation power of minorities (members with lower required returns)	
		weak	strong
IRR of the project	IRR<k_e	project rejected	project approved no compensation
	IRR>k_e	project approved with compensation	project approved no compensation

Then, in a cooperative the interest rate applied in the decision process is not based on the assessment of the systematic risk but it depends on the rules for the benefit allocation and the preference structure of members. In the model these conditions were represented by the possibility of discrimination in return allocation, the farmers' risk aversion and the covariance between the returns of the farms and the cooperative.

7. Transaction cost implications of the model.

The results of the analysis show the limits of the effectiveness of cooperative organizations. According to the institutional approach, cooperatives are coordination

[23] In the determination of the negotiation power, a group's threat of leaving the cooperative (causing loss of profits for the other groups) is a relevant factor (Staatz, 1983). In the proposed matrices, a strong power

tools useful to reduce the transaction costs in the interaction between the farmers and the market (external transaction costs). Through cooperatives, farmers are able to achieve better vertical coordination and reduce their subjection to opportunistic behavior (Staatz 1989, Saccomandi 1992).

However this improved coordination is achieved at the expense of the efficiency of the decision processes, which results in internal transaction costs. The financial analysis showed that the internal transaction costs influence the determination of the required returns for the cooperative's investment evaluation and make the cooperative decision process inconsistent with an IOF under similar circumstances.

The effectiveness of a cooperative organization is determined by the relative size of the two typologies of transaction costs. If the benefits coming from the reduction of the external transaction costs exceed the higher internal transaction costs (due to the bargaining process) then a cooperative results in an efficient organization. The performance of the cooperative is determined by the trade off between more costly internal coordination and improved external coordination.

8. Conclusions.

The traditional financial models show that IOF investment decisions depend mostly on the expected returns and on the risk of the project (Fisher 1930). The coalition framework

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of the minorities assume that they can make a credible threat (due for example to low asset specificity) while the majority cannot (high asset specificity).

and the financial model proposed in this paper, showed that, in a cooperative, the decision is influenced by additional factors. Specifically:

- *factors related to members' individual preferences.* These factors include the members' risk aversion, the composition of their investment portfolio and the covariance of the farm and cooperative returns.
- *institutional factors.* Cooperative decisions are conditioned by the institutions determining the rules for the bargaining process among the coalitions' groups. Examples of these factors are the voting rules, the mechanisms for the elections of the directors and their attributions.
- *distribution of the bargaining power across members.* The financial model shows that members may have different evaluations of the project and the application of the compensation principle proposed by the Coase Theorem may be costly. Thus, members' power within the cooperative may determine the emergent strategy.

The additional factors influencing members' investment evaluations invalidate the general NPV rule applied by IOFs. However, the transaction cost approach shows that potentially higher internal transaction costs (due to members' heterogeneity) do not imply an absolute competitive disadvantage with respect to other organizations: the potential inefficiency of the decision process may be compensated by a more effective external coordination.

Finally, the model presented in this paper raises several issues for further research. In this paper, the focus was on members. The coalition framework stresses the relevance of other groups such as managers or the board of directors. A complete description of the cooperative decision processes should include an analysis of the influence of these groups on the strategies. The problem is particularly relevant because of the heterogeneity of the objectives of the members that makes the determination of the incentive structure for managers and directors more difficult. Also, the model utilizes strong assumptions. Particularly, the assumptions of independent evaluation of investments, no option value and of independence of the farm production decisions limit the application of the model. The introduction of real options techniques may be used to overcome these problems.

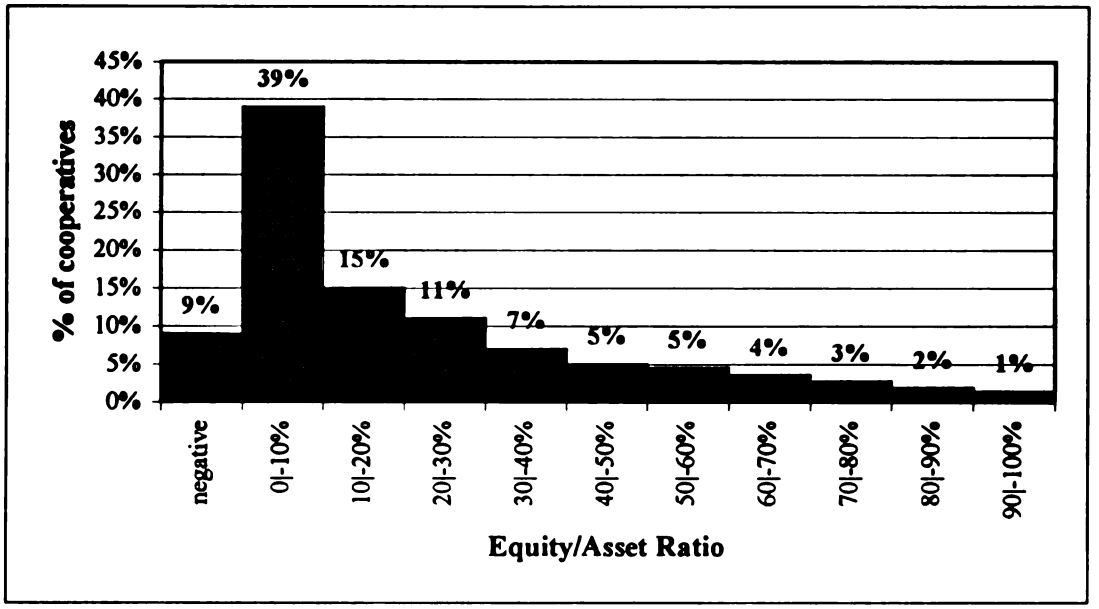
CHAPTER IV: EFFECTS OF MANAGERS' POWER ON CAPITAL STRUCTURE: A STUDY ON ITALIAN AGRICULTURAL COOPERATIVES

1. Introduction.

The Italian food system is evolving rapidly. Although the driving forces and the direction of this change are not always clear, many authors agree that the future food system will be global, consumer oriented and capital intensive. These three factors stretch the limits of traditional agricultural cooperatives, usually characterized by limited exports, rigidity in input supply and low equity (Dobson, 1998; Cook, 1993; Chesnik, 1997). This paper will focus on the capitalization issue since responding to global demands will be difficult for Italian cooperatives due to their excessive debt financing.

Most Italian agricultural cooperatives are in financial distress (as shown in Figure 4.1) due to excessive leverage, which reduces a cooperative's efficiency by adding costs both in terms of higher transaction costs and missed profit opportunities (Manelli, 1996). Economic literature attributes these 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).

Figure 4.1: The Equity/Asset Ratio for 2,322 Italian Agricultural Coop. (1995)



Data source: Confcooperative

The undercapitalization of cooperatives in Italy has been hypothesized by many Italian authors (Iannello 1994, Mazzoli and Rocchi, 1996). This paper is the most extensive empirical study on this subject due to the new national data that was made available. Figure 4.1 confirms the undercapitalization of Italian cooperatives. The data showed that, out of a sample of 2,322 Italian agricultural cooperatives, 48% had an equity/asset ratio lower than 0.10 (Confcooperative, 1998). Fiorentini (1995) compared the capital structure of a sample of Italian agricultural cooperatives with a sample of investor owned firms (IOFs) and found that cooperatives were relatively undercapitalized (0.4 equity/fixed asset ratio vs. 0.7 for IOFs). Cooperative undercapitalization is not exclusively an Italian problem. In the US, recent surveys show a decline in membership and patron equity levels (USDA 1997). US cooperative capitalization varies among industries: the average industry debt/assets ratio ranges from .49 for cotton to .81 for

poultry/livestock (Chesnik, 1997). Although this paper focuses on Italian cooperatives, the conclusions may have global implications.

In this paper, the factors influencing Italian cooperatives' capital structure were analyzed using the coalition theoretical framework (Staatz, 1983). According to this framework, cooperative capitalization is influenced by the personal preferences of the individuals and groups composing the cooperative. An empirical test provided evidence of the framework's conclusions utilizing a new dataset about Italian cooperatives and focusing on Italian managers' power. The study hypothesis is that, when managers are able to influence the capital structure, cooperatives are less leveraged. The rationale of this hypothesis is discussed in section 2. The analysis has two steps: first an index was developed that represents cooperative managers' power, then, it was tested for its influence on the capital structure using a GLS regression model.

2. The Model and the Study Hypothesis.

The coalition theoretical framework states that a cooperative consists of many groups having different objectives and attempting to maximize their own individual utility even at the expense of other groups within the organization. This situation is particularly relevant to cooperatives because costs and benefits can be allocated among groups according to a multiplicity of rules. By setting prices for members' products, offering specific services and choosing capitalization strategies, the coalition decides which group will profit and which one will pay the cost of operations. Then, each group decides which strategy to support considering not only the total returns but also the way costs and

benefits are allocated. Investments with low returns may become more attractive if it is possible to transfer a sufficient portion of the cost to another group. In this context, if the transaction costs between the groups are high enough, the adoption of Pareto-inefficient strategies is possible. In fact, if such transaction costs are higher than the increase in value caused by the efficient strategy, groups have no incentive to negotiate an efficient solution based on the compensation principle, as stated by the Coase theorem (Coase, 1960). As a consequence, the cooperative strategy will not be determined solely by an efficiency principle, but it may be influenced by the initial distribution of resources and power among the groups of the coalition.

This study evaluates of the effects of the bargaining power of managers. According to the general formulation of the principal-agent model; if members are not able to monitor (and enforce) managers' behavior, then managers have the incentive to behave opportunistically by maximizing their own utility instead of the members'. Since Italian cooperative managers usually were compensated on fixed wages not based on performance, they are expected to support risk-minimizing strategies (reducing the bankruptcy risk) rather than to maximize members' return.[24] In determining the cooperative capital structure, managers are expected to show a preference for equity

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[24] In fact, assuming that manager utility is evaluated by the present value of the wages, the objective function of the manager may be described by the following equation: $\max\left(\sum_{t=1}^{N}(1-p)^t \frac{W}{(1+k)^t}\right)$, where W is the yearly wage, k is the appropriate discount rate and p is the probability that the cooperative goes bankrupt in that year. Assuming k is constant and W being the fixed wage, constant by definition, then the manager can maximize his/her utility only by minimizing the probability of bankruptcy (i.e. by implementing risk minimizing strategies). In the case of fixed wages, members' returns may be considered as a constraint for the manager, who is supposed to achieve a minimum level of returns in order to keep his/her job.

because high leverage increases the financial risk of the cooperative (Murray, 1983). This preference is assumed to be stronger if the risk of the cooperative business is high. Hence, the hypothesis is that when managers effectively influence the capital structure through their bargaining power, the cooperatives are less leveraged. The leverage level is measured through the equity/asset ratio of the cooperative, which we assume will be higher and positively associated with risk for cooperatives with powerful managers.

This hypothesis was tested using a new data set provided by the Confederazione Cooperative Italiane[25] including both financial and structural data. The original data set included 2,322 agricultural cooperatives. The 521 firm sample used in this analysis was selected based on two criteria: availability of a three-year time series and the availability of detailed information about the value of patronage refunds.[26] The federations of cooperatives were excluded from the sample because of their peculiar characteristics.[27]

3. Measurement of Manager Power.

The first step in the analysis consisted of identifying cooperatives characterized as having effective manager's bargaining power (i.e., the ability to effectively influence the strategies by imposing his/her preferences on the groups within the cooperative).

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[25] Confederazione Cooperative Italiane (Confcooperative) is the most representative Italian association of cooperatives in agriculture.

[26] Italian cooperative law does not require cooperatives to disclose the total value of prices and patronage refunds paid to members. In the financial statements, this value is included in the cost for raw materials and auxiliary goods.

[27] Federations of cooperatives were excluded because in Italy federations are composed exclusively of cooperatives represented either by their Board or by their managers. In this case, the members-managers relationship presented characteristics significantly different from the other cooperatives.

In order to identify cooperatives characterized as having effective manager's bargaining power, indicators were developed based on three assumptions:

1. Powerful managers can retain resources for the cooperative rather than pay them out to members. Managers have the incentive to keep resources within the cooperative where they can control them. Powerful managers reduce the resource transfer to members both in terms of profits, prices and patronage refunds.
2. Managers' power is directly related to the number of members. We assume that as the number of cooperative members increases so does the number of groups. If the groups are heterogeneous, which is likely to be the case, the negotiation process between members becomes complicated and the transaction costs rise. Therefore, we assume that managers have more opportunities to impose their preferences if membership is large, heterogeneous and divided into numerous factions.
3. Managers' power is inversely correlated to members' participation in the cooperative. The more active members are in annual meetings and the decision making of the cooperative, the less power the manager has.

Given these assumptions, an index of effective manager bargaining power was developed, based on four indicators summarized in Table 4.1: percentage of revenues transferred to patrons, percentage of revenues retained by the cooperative, natural logarithm of the number of members and percentage of members attending annual meetings. The first two indicators were derived from assumption 1 and they describe the ability of powerful managers to withhold resources, hence, reducing the profit margin of members. The other indicators derive directly from assumptions 2 and 3. Table 4.1

reports the absence of a significant linear correlation between the four indicators and the equity/asset ratio, showing the absence of tautologies in the model. The sign of the expected correlation with managers' power was derived from the stated assumption.

Table 4.1: Determining Factors for Manager Power

Indicators	Description	Definition	Expected Correlation with Manager Power	Correlation with Equity/Asset ratio
PP_i	percentage of revenues transferred to patrons	$\frac{pr_i + rm_i}{revenues_i}$ pr_i= patronage refunds rm_i= price paid for members' products	negative	-0.1395
PC_i	percentage of revenues retained by the cooperative	$\frac{NIAT_i + Dep_i + \sum app_{i,n}}{revenues_i}$ NIAT= net income after taxes dep = depreciation app = year's fund appropriations	positive	0.1197
LM_i	natural logarithm of the number of members	*ln*(n. of members)	positive	0.3629
PM_i	percentage of members attending annual meeting	N/A	negative	-0.2531

The indicators were aggregated into an overall power index (PW_i) calculated for each cooperative using 1995 data according to the following function:

$PW_i = f(-PP_i) + f(PC_i) + f(LM_i) + f(-PM_i)$

Where f is an operator such as:

$$f(x_{ij}) = \begin{cases} 1 & \forall x_{ij} > \bar{x}_j + \sigma_j \\ 0 & \forall \bar{x}_j - \sigma_j \le x_{ij} \le \bar{x}_j + \sigma_j \\ -1 & \forall x_{ij} < \bar{x}_j - \sigma_j \end{cases} ;$$

Where j denotes food-processing (value-added) versus non food-processing cooperatives because of the differences in the average values of the four indicators due to cooperatives' activity (see appendix A for details on the segregation); x_{ij} is the value of any of the four indicators for the i^{th} cooperative; $\bar{x}_j$ is the sample mean; σ_j represents the sample standard deviation.

Each indicator captures a different aspect of manager's power, and, when added together, they give a general power score that can range from –4 to +4. A positive value for PW_i denotes effective bargaining power of managers (Powerful Manager Cooperatives or PMC), while a negative PW_i implies its absence (Non-Powerful Manager Cooperatives or NPMC). Given the theoretical framework, PMCs were expected to pursue the maximization of managers' utility, while NPMCs were assumed to pursue members' utility maximization.

Table 4.2 : Descriptive Statistics for PMCs vs. NPMCs, 1995 (US$ values in mill.)

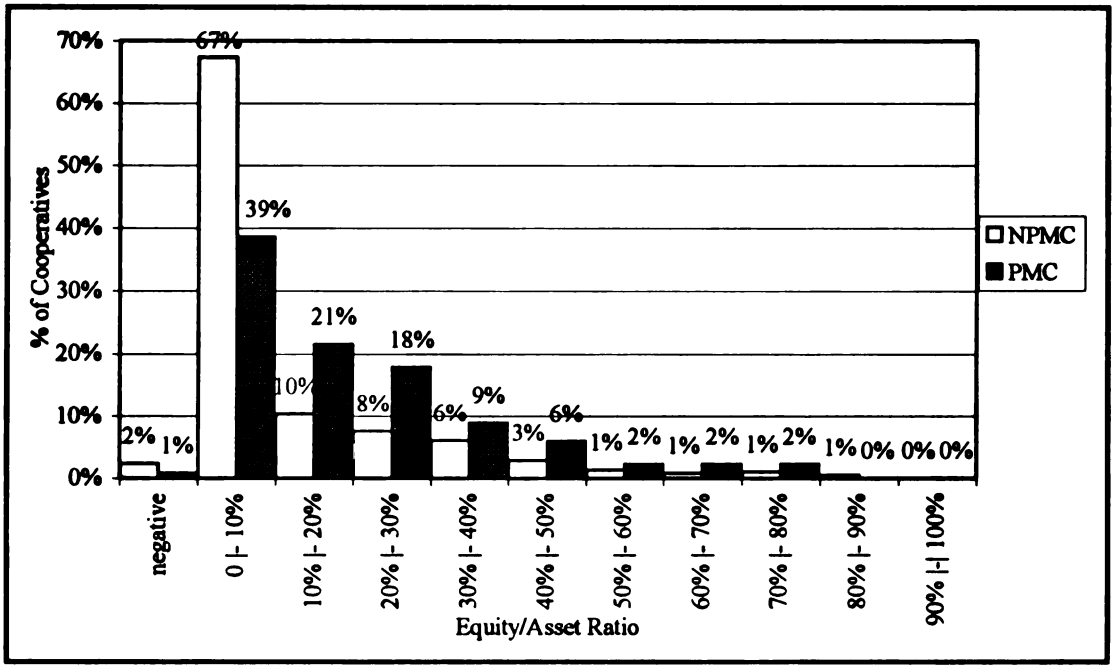
	PMC	NPMC	Average for Total Sample
Number of Cooperatives	135	386	521
Average Revenues	$6.79	$3.90	$4.85
Average Net Income After Taxes	$0.93	$0.37	$0.48
Average Equity	$1.36	$0.46	$0.75
Average Total Assets	$6.59	$3.41	$4.46

Data source: Confcooperative

The first major result of this study is in Table 4.2, where the PMCs and the NPMCs are compared. The sample averages for the two types were compared, and in all accounts,

these cooperatives were found to be distinctly different. Specifically, PMCs were financially larger in terms of revenues, equity and total assets.

Figure 4.2: Distribution of the Equity/Asset Ratio for PMCs and NPMCs, 1995



Data source: Confcooperative.

Figure 4.2 describes the difference in the distribution of the equity/asset ratio between the 135 PMCs and the 386 NPMCs of the study sample. It shows that 69% of the NPMCs have an equity/asset ratio lower than 0.1 compared to 40% of the PMCs. The average NPMCs' equity/asset ratio was 0.10 compared to 0.19 of PMCs.[28] A t-test under the assumption of unequal variance comparing the equity/asset ratios showed that the two sub-sample averages were significantly different (1% significance level). The test provides the first empirical evidence of the incidence of power distribution among groups

within the cooperatives on the capital structure: on average PMCs are significantly less leveraged than NPMCs. The empirical results support the theoretical framework and hypothesis.

Given the major finding to this point (a significant difference between PMCs and NPMCs in terms of their Equity/Asset ratio) we estimated a regression model in the next section to further investigate the different capitalization strategies.

4. The Equity/Asset Regression Model.

In the previous section, an index for powerful manager cooperatives was specified and calculated. In this section a regression model was used to determine the factors that influence the equity/asset ratio for Italian agricultural cooperatives and to test differences in PMCs' capital structure. Table 4.3 gives a comprehensive explanation of all the variables used in the required model.

The regression utilizes some of the explanatory variables proposed by Barton, Parcell and Featherstone (1996) for the determination of the optimal cooperative capital structure. The specific explanatory variables were: the cooperative profitability, the average interest rate and the variability of profitability. Unlike the Barton, et al. model, the variance of the interest rate was not included in this analysis.[29] The dependent variable was the

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[28] In the same year, the equity/asset ratio for US cooperatives ranged, depending on the industries, from 31.5% (livestock) to 70.7% (services). (USDA 1996)

[29] According to the Barton, Parcel and Featherstone's model, if the interest rate is assumed to be a non stochastic variable, the optimal solvency ratio for a cooperative is given by the formula $s = \frac{\rho \cdot \sigma_A^2}{R_A - K}$ where

equity/asset ratio. Given the results of the Barton et al. model, the regression coefficients of these variables are expected to be positive. Profitable businesses should be able to attract equity, a high interest rate should discourage debt financing and high profit variability calls for lower leverage to reduce the overall risk level.

In order to adapt the model to the Italian context, the fixed assets/total asset ratio and a dummy variable identifying the food-processing cooperatives were added. Hence, the investment structure and the activity of the cooperative become endogenous variables in the model. The regression coefficient of the fixed assets/total asset ratio is expected to be positive because balancing fixed investment with equity is considered a good management practice. The expected sign for the food-processing cooperative dummy variable is negative, given the specific characteristics of these firms (namely the different financial needs and asset structure).

Finally, a dummy variable identifying PMC was added, in order to test the study hypothesis. According to the standard dummy variable technique, all of the cross products of the powerful manager dummy variable and the continuous variables were included in the model. These variables were instrumental in capturing the influence of the presence of powerful managers on each individual coefficient. Thus, the specific impact on each factor was evaluated. The expected sign of these instrumental variables

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s is the solvency ratio, ρ is the Pratt-Arrow decreasing relative risk aversion coefficient, σ^2_A is the variability of the return on assets, R_A is the return on assets and K is the interest rate. Similar models were developed by Collins (1985) for farmer leverage and Foster (1996) for Agribusiness firms. The formula explains the expected signs of the coefficients of prof, int and vp9496 reported in table 6. The expected sign for the asstr variable was stated by Titman and Wessel (1988).

represents the expected change in the coefficient of the respective continuous variables due to the presence of powerful managers. Thus, a decrease either in profitability or in interest rate was expected to have less impact in PMCs because managers, concerned about risk, would use their power to limit the use of debt. Conversely, an increase in the performance or operational risk was expected to have a greater impact on PMCs, given the risk minimizing preferences of the managers.

Table 4.3 : Explanatory Variables of the GLS Model

Variable	Description	Definition	Expected sign
$prof_i$	A proxy for cooperative profitability.	$\frac{pr_i + rm_i + NIAT_i + dep_i + \sum app_{n,i}}{revenues_i}$ pr_i= patronage refunds paid to members rm_i= price paid for members' products, $NIAT_i$= net income after tax dep_i = depreciation, app = year's fund appropriations	positive
int_i	A proxy for the cost of debt financing.	$\frac{intex_i}{TA_i - equity_i}$ $intex_i$ = interest expenses TA_i = total assets	positive
$asstr_i$	The ratio between fixed asset and total assets;	$\frac{fixed\ assets}{total\ assets}$	positive
$vp9496_i$	A proxy for the variability of cooperative profitability.	standard deviation($prof_{i,t}$) t = 1994, 1995, 1996	positive
$valadd_i$	A dummy variable identifying food-processing cooperative	$valadd_i \begin{cases} = 1 & food-process.\ coop \\ = 0 & otherwise \end{cases}$	negative
pm_i	A dummy variable for powerful manager cooperatives	$pm_i \begin{cases} = 1 & \forall PW_i > 0 \\ = 0 & otherwise \end{cases}$	positive
$pm_i \cdot prof_i$	instrumental variables evaluating the effect of powerful managers on the continuous variable coefficient	$\begin{cases} = prof, int, asstr\ or\ vp9496 \\ \forall pm = 1 \\ = 0 \quad \forall pm = 0 \end{cases}$	negative
$pm_i \cdot int_i$			negative
$pm_i \cdot asstr_i$			positive
$pm_i \cdot vp9496_i$			positive

5. Results.

The model was estimated using the GLS approach to correct for heteroskedasticity which was indicated by the Breusch Pagan test (significant at 1% level). The results of the equity/asset ratio regression model are shown in table 4.4.

Table 4.4: Equity/Asset Ratio GLS Regression Results

Variable	Coefficient	t-Stat
intecept	-0.0251	0.7764
prof	0.0925	*3.3134
int	1.9108	*12.1836
asst	0.3214	*6.8304
vp9496	-0.1007	1.2789
valadd	-0.0575	*3.3121
pm	-0.0046	0.0927
pm*prof	0.0580	1.0580
pm*int	-1.0148	*2.0719
pm*asst	0.1517	**1.7469
pm*vp9496	0.3928	*2.6641
GLS weighted regression R^2		0.5074
F-statistic		*52.5393
F-stat. for test on joint significance of all coefficient related to pm		*7.9294

* Significant at 1% level
**Significant at 10% level

The signs of the continuous variable coefficients coincided with the expectations. The only exception was the variability in profits (vp9496), which was negative but not significant at the 10% level. Later in the paper, this result is explained when a comparison is made between NPMCs and PMCs. The sign on the dummy variable for manager power (pm_i) was negative which was contrary to expectations. However, the associated t-statistic showed that the coefficient was not significant at the 10% level.

The equity/asset ratio was positively correlated with the cost of financing, fixed asset/total asset ratio and cooperative profitability. These results are intuitive and they reflect the expectations. An increase in the interest rate makes equity sources more attractive, because it raises the cost of debt financing; a correlation between fixed assets and equity is considered good management to reduce risk induced by operating leverage; and high profitability may make members more willing to invest in the cooperative.

PMCs presented a significantly different equity structure than NPMCs. The F-test on the joint significance of all the parameters associated with the dummy variable for manager power (pm_i) and its cross-products was significant at the 1% level. This result provides statistical evidence of the influence of manager power in the determination of the equity/asset ratio. The individual t-tests on the variables confirmed that PMCs are significantly different in all slope coefficients except profitability, meaning that these cooperatives react to changes in their environment by adopting different capital structure strategies. In particular, the results stress the differences in the reaction to a change in the cost of financing and profit variability (both statistically significant at 1% level). The signs of the instrumental variable are consistent with expectations, except for the cross product between the dummy variable for manager power (pm_i) and the profitability variable ($prof_i$) which is positive but not significant.

To provide more detailed insight into the capital structure of the PMCs and NPMCs, two additional regression equations were estimated. The same model was run independently

for both PMCs and NPMCs. The first equation only has PMCs (135 cooperatives) and the second equation has only NPMCs (386 cooperatives).

Powerful Manager Cooperatives (135 observations, R^2: 0.35, F-stat: 11.38):

$(E/A)_i$= - 0.05 + 0.16 $prof_i$ + 0.90 $intex_i$ + 0.30 $vp9496_i$ + 0.48$asst_i$ – 0.04 $valadd_i$
t-stat: (0.43) (2.65)* (1.59) (1.95)** (5.33)* (1.15)

Non Powerful Manager cooperatives (386 observations, R^2: 0.48, F-stat: 68.86):

$(E/A)_i$= -0.01 + 0.09 $prof_i$ + 1.88 $intex_i$ - 0.11 $vp9496_i$ + 0.32 $asst_i$ – 0.07 $valadd_i$
t-stat: (0.21) (3.39)* (12.82)* (1.49) (7.40)* (3.45)*

* Significant at 1% level
** Significant at 5% level

Compared to powerful manager cooperatives, NPMCs' had higher t-statistics for profitability (prof), asset structure index (asst), and interest rate (intex). The two types of cooperatives presented an opposite sign for the variability of profitability (vp9496): on average, given an increase in profitability PMCs will reduce the financial leverage, while NPMCs will increase it. Both NPMCs and PMCs reacted to an increase in the asset structure ratio by increasing equity. However, the PMC did show a higher sensitivity to the asset structure ratio. Changing the interest rate (ceteris paribus) was expected to have a significant influence on the capital structure of NPMCs; however there was no definitive evidence of its influence on PMCs' leverage (the coefficient has a p-value of 0.11).

NPMCs' sensitivity to cost of financing may be explained by the members' concern about the profit margin reduction due to interest expenses. Powerful managers may be

less willing to reduce equity even if the interest rate on debt decreases due to their risk-minimizing behavior (as we stated in section 2). In fact, higher leverage implies higher risk even in the presence of low interest rates. The difference in coefficient signs for profit variability can be explained by the risk minimizing approach of powerful managers (that led to lower leverage) and by the unwillingness of members to invest capital in a risky business.

The empirical results support the theoretical framework. The study hypotheses are both supported: we found that, when managers have an effective bargaining power, cooperatives are actually less leveraged and their capitalization strategy is influenced by the managers' objectives (bankruptcy risk minimization).

6. Conclusions.

Excessive leverage is one of the most important problems facing Italian agricultural cooperatives as the international competition in the EU intensifies. The analysis showed that there is a structural difference between powerful manager cooperatives and non-powerful manager cooperatives. Powerful manager cooperatives: were less leveraged, had a more conservative financial strategy and focused on minimizing financial risk by increasing their equity/asset ratio. The overall strategy of these cooperatives increased the probability of long term competitiveness of the cooperative. The important byproduct from powerful managers maximizing their objectives was that the higher equity/asset ratio reduces the financial distress, making more resources available for international competitiveness.

The maximizing strategy of powerful managers, however, is a different strategy than that of the members. The data and the analysis illustrate that the members prefer to provide minimum capital to the cooperative. Thus, we have a dilemma where managers' behavior reduces the utility of the members but increases the total value and competitiveness of the cooperative. Given the fact that 48% of Italian cooperatives have an equity/asset ratio of less than .1 and that cooperative equity/asset ratios are significantly lower than the investor owned firms in Italy, the industry and the government need to find tools to encourage members to invest.

The objective of future research should focus on ways to align member's and managers' objectives to a value maximizing strategy. New generation cooperatives and trust-based relationships are of particular interest. The members' investment minimizing behavior must be understood so that incentive for strong membership and good capital structure may be developed. Ways to improve the internal bargaining process within the cooperatives also need to be studied. Lastly, policies that positively reinforce the current investment-minimizing behavior of members needs to be identified.

Appendix A.

Compared to food-processing cooperatives, Italian non food-processing cooperatives had a significantly different variance and mean for the variables related to the number of members, average participation in annual meetings, members' profit margin and equity/asset ratio. The powerful manager indicators were calculated separately due to the differences in the variable distributions. The following table reports the percent frequencies of Powerful Manager Cooperatives (PMCs) and Non Powerful Manager Cooperatives (NPMCs) segregated by food processing versus non-food processing cooperatives.

Table 4.5 Percentage of Cooperatives with Powerful Managers

Groups	PMC (%of coop.)	NPMC (%of coop.)	Total
Food Processing	32.39	67.61	100.0
Non Food Processing	34.55	65.45	100.0
Weighted Average	32.83	67.17	100.0

The proportion of powerful manager cooperatives was approximately the same in the two groups. The data suggest independence of the power distribution from the economic activity (a χ^2 test reported a p-value of 0.6676, which fails to reject the null hypothesis of independent variables at any reasonable significance level).

CHAPTER V: CONCLUSIONS

The results presented in the three papers generate the question: Will Italian agricultural cooperatives be competitive in the rapidly evolving food sector?

In the second chapter, the analysis of the emergent strategies showed that Italian cooperatives are reacting to the changes in the economic environment through a broad set of strategies, ranging from the exploitation of local niche markets to competition in the open market. However, the data show that the cooperatives able to compete successfully outside narrow niche markets are a minority. In Italy, the cooperative organizational model seems to be conditioned by specific factors limiting the possibility of its broader success. The results of this thesis offer an interpretation of these conditions.

According to the economic literature, one of the cooperatives' primary functions consists of reducing the farmers' transaction costs and the overall risk associated with farming operation (Staatz 1989). However, this goal is achieved through an organizational model that is not fully able to manage the divergences in members' objectives. In fact, cooperatives' decisions are influenced by the personal preferences of members (who are not indifferent to the cooperative activity) and they are not necessarily consistent with the general NPV rule utilized by IOFs. This condition derives from the presence of internal transaction costs preventing the groups of the coalition from achieving an efficient settlement of the divergent interests based on free negotiation and the compensation principle. These "internal transaction costs" increase the cost of internal coordination of

cooperatives: managers and directors may be forced to allocate significant resources to manage members' heterogeneity.

This framework suggests that the success of the cooperative model depends on the importance of two kinds of transaction costs: the external transaction costs (ETC), affecting the exchanges between farmers and the other food market operators, and the internal transaction costs (ITC) concerning the interaction between the groups of the coalitions. If the ITC result relatively low compared to the ETC, then the condition for cooperative existence is respected.

The success of a cooperative is conditioned both by internal and external conditions. In order to have an efficient cooperative, the benefit coming from the improved coordination (both vertical and horizontal) must be higher than the cost of the negotiation process necessary to organize the activity of the cooperative (Peterson, 1992). The efficiency of cooperatives depends on the presence of market imperfections (which make the farmers' organization profitable) and on the possibility of minimizing the internal transaction costs or, more explicitly, to facilitate a free and costless bargaining process among groups.

These conclusions help to explain the differences between US and Italian cooperatives. American organizations seem to be characterized by lower ITCs. They are able to aggregate a larger number of farmers maintaining an adequate level of efficiency. Then, the possibility of competing successfully for Italian cooperatives is conditioned by their

ability to reduce the cost of coordinating the groups of the coalition. In fact, the characteristics of the Italian farm system (particularly, the large number of farmers and the diversity of farms even in local areas) favor the heterogeneity of members and increase the complexity of the negotiation process.

Italian cooperatives could be more efficient if they could lower the cost of the negotiation process. However, the negotiation process among groups is a distinctive characteristic of cooperatives, and its complete elimination may not be the best alternative for members. The third paper of this thesis showed that substituting the negotiation with a power-based relationship may prevent the cooperative from achieving at the same time the firm value maximization and the members' utility maximization. The analysis of the capitalization issue showed that, when managers have a significant decision power, members pay higher equity and receive lower benefits.

Given the importance of negotiating, information flow and communication are critical factors for the success of Italian cooperatives. Recurrent issues raised by cooperative management literature, such as patrons' participation and the relevance of communication between management and members, stress the importance of this point (Bloomquist 1983). Also, this conclusion has relevant implications for managers and directors, who assume a broader role than in IOFs. In fact, since cooperative officers usually have access to detailed information about the cooperative, they can facilitate the negotiation process significantly if they use their office to improve communication and information across the cooperative. This implies that, in a cooperative, managers and

directors must possess a broader set of skills than in an IOF: in fact, besides the management of the business, they must be able to mediate between the groups of the coalition and facilitate the negotiation process.

Finally, it is possible to summarize the results of the analysis presented in this thesis in the following points:

- Italian agricultural cooperatives are reacting to the change in the food system by implementing diverse strategies. This trend can be summarized in the dichotomy between the focus on the interaction with the local community and market oriented approach. The market-oriented cooperatives are subjected to intense competition that stresses the necessity of efficient investment decisions.
- The financial analysis showed that the decision process of cooperatives is more complex than IOFs because of the diverse objectives of members who are not indifferent to the production decision of the cooperatives. The uniqueness of the cooperative decision process implies the possibility of implementation of inefficient strategies. Specifically, if the internal transaction costs are relatively high, the strategy of the cooperative depends on the distribution of the contractual power among groups and it is not determined by the principle of firm value maximization.
- The proposed framework was used to analyze the cooperative capitalization problem and an econometric model was built to test the hypothesis. Empirical data supported the model and, at the same time, suggested the relevance of the internal transaction costs in the Italian agricultural cooperatives.

- The analysis showed that the cooperative organization is efficient only if the higher costs of the internal decision processes are more than compensated by the improved coordination and the reduction of the external transaction costs. Therefore, cooperatives are not characterized by an intrinsic competitive disadvantage but they are an organization able to meet specific market conditions efficiently.

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