

Farm Size Adjustment and Contract Regulation (I. #203/82): Evidence from an Italian Case Study

Adele Coppola, Francesco de Stefano and Teresa Del Giudice

Department of Agricultural Economics and Policy, University of Naples Federico II -
Italy



**Paper prepared for presentation at the 94th EAAE Seminar
'From households to firms with independent legal status: the spectrum of
institutional units in the development of European agriculture',
Ashford (UK), 9-10 April 2005**

*Copyright 2004 by [A. Coppola, F. de Stefano and T. Del Giudice]. All rights reserved.
Readers may make verbatim copies of this document for non-commercial purposes by any
means, provided that this copyright notice appears on all such copies.*

Farm size adjustment and contract regulation (l. #203/82): evidence from an Italian case study

Coppola A., de Stefano F. and Del Giudice T.¹

Abstract

In Italy, the structure of farm has always shown remarkable elements of weakness. Among these, the small dimension, in terms of arable land, has represented one of the most difficult to resolve. The absence of a legislation that could favour jointness of the property have remarkably reduced the market of the land.

In this scenario, a new law n. 203/1982 was lunched. Now farmers are considering rent land a possible strategy to increase hectares. The object of this paper is to analyse the situation of land contract in Campania Region. A better understanding of these topics should improve public policies for a better adjustment process.

Keywords

Adjustment process, contract regulation, farm structure, rented land.

1 INTRODUCTION

In Italy, the structure of farm has always shown remarkable elements of weakness. Among these, the small dimension, in terms of arable land, has represented one of the most difficult to resolve. Small dimension has been determined by some elements. One of the peculiarity of Italian farmer dimension is the small average arable land; this aspect is gotten worse from the successive fragmentation of arable land among generation. Moreover, the absence of a legislation that could favour merger of the property have remarkably reduced the market of the land.

However, Italian legislation related to land rents and to the right of use of land generated an absolute stasis of rent contracts market.

In fact, landlords didn't have confidence in expiration of the contract and in its economic content, so they were no stimulates to apply any type of land contract.

In this context, a new law n. 203/1982 was implemented. It extinguishes progressively old contracts and describes meticulously the rules for expiration of the contracts and for the right for tenant and landlord.

After about 20 years, this law seems to work better. In fact, now farmers keep into consideration favourably rent land as a possible strategy to increase hectares.

Data shown that from 1980 to 2000 rented land is increased and the average size of farms with rented hectares are bigger than before.

Although a considerable amount of interest has been focussed on this topic, until recently, very little work has focused in the Italian literature on the territorial distribution of rented land and on its implications on the adjustment of the farm size.

¹ Adele Coppola is Associate Professor at Department of Agricultural Economics and Policy, University of Naples Federico II – Italy, Francesco de Stefano is Professor at Department of Agricultural Economics and Policy, University of Naples Federico II – Italy and Teresa Del Giudice is researcher at the same Department. The Authors are researchers at Centro per la Formazione in Economia e Politica dello Sviluppo Rurale - Portici - Italy. Paper/poster presented at the EAAE Seminar on Institutional Units in Agriculture, held in Wye, UK, April 9-10, 2005.

The object of this paper is to analyse the situation of land contracts in Campania Region. The paper is organized in four sections. To begin with, we outline briefly the evolution of the strategy of size adjustment on the basis of collected data in the 3rd, 4th and 5th General Agricultural Census available at farm level. In section Three, we analyse the 5th General Agricultural Census' data; in this context, we highlight the major relations between the presence of rented land and farm characteristics and the role played by this strategy in size adjustment on technical and land-using choices. Finally, section Four concludes.

2 TENANCY EVOLUTION

New contract regulation #203/82 was introduced about 20 years ago. Only in the last decades, the development of rented land contracts seems to be more evident (Povellato 1997). It is not possible to analyse the evolution of the process because researchers and policy makers, after a great interest shown at the beginning, haven't added new studies to this body of literature. However, data for Italy and for Campania Region show the evolution of rented and no rented arable land hectares and related number of farms.

In Italy, during last 20 years land and number of farms are decreased (land from 23.6 millions to 19.6 millions of hectares and farms from 3.2 millions to 2.5 millions) (table 1). In this situation, farms characterized by tenancy and property have shown a different evolution with a less reduction (property/tenancy farms -6.4% from 1990 to 2000 respect to -14% for all farms; land of property/tenancy farms -1.6% from 1990 to 2000 respect to -13.6% for all farms) (table.2).

Evolution in Campania Region seems different. In fact, property/tenancy farms have decreased more than others. But, in this case, number of farms have a negative variation bigger than land variation (property/tenancy farms -26.5% from 1990 to 2000; land of property/tenancy farms -16% from 1990 to 2000). It could be a evidence of an adjustment process that is moving to farms characterized by larger size.

TABLE 1 - Farms and Land in Agricultural Census

	2000		1990		1982	
	farms <i>000 n.</i>	land <i>000 hectares</i>	farms <i>000 n.</i>	land <i>000 hectares</i>	farms <i>000 n.</i>	land <i>000 hectares</i>
Italy						
Complete property farm	2249	13404	2660	16666	2802	17684
Complete rented farm	97	1452	95	1208	131	1410
Both, property and tenancy	246	4750	263	4828	327	4538
<i>property</i>		2312		2505		2356
<i>tenancy</i>		2438		2323		2182
Total	2592	19606	3018	22702	3259	23631
Campania Region						
Complete property farm	210	674	223	762	223	822
Complete rented farm	16	47	21	44	31	54
Both, property and tenancy	23	157	32	187	38	185
<i>property</i>		82		105		101
<i>tenancy</i>		75		82		84
Total	249	879	275	992	292	1061

Source: 3rd-4th-5th General agricultural census

TABLE 2 – Farms and land variation

	Variation % 2000/1990		Variation % 1990/1982	
	farm	land	farm	land
Italy				
Complete property farm	-15.4	-19.6	-5.1	-5.8
Complete rented farm	2.4	20.1	-27.4	-14.3
Both, property and tenancy	-6.4	-1.6	-19.6	6.4
<i>property</i>		-7.7		6.3
<i>tenancy</i>		5.0		6.5
Total	-14.1	-13.6	-7.4	-3.9
Campania Region				
Complete property farm	-5.7	-11.5	0.0	-7.3
Complete rented farm	-22.9	8.2	-34.3	-19.1
Both, property and tenancy	-26.5	-15.9	-17.7	0.6
<i>property</i>		-22.1		3.2
<i>tenancy</i>		-7.9		-2.4
Total	-9.4	-11.4	-6.0	-6.5

Source: 3rd-4th-5th General agricultural census

3 LAND RENTING AND AGRICULTURE IN THE CAMPANIA REGION

3.1 Land renting and farms typologies

The Italian agricultural census data include many different farm typologies, from situation where agricultural activity is a way to integrate incomes that mainly come from other sectors or to produce self consumption goods, to situation where, on the contrary, the farm is the main source of income and employment and where production choices follow the economic rules of firm theory. Related to different farm typologies, different is the role land can play in the objective function: land is mainly assumed as a component of the farm or family asset in the first case, while in the second one it is, above all, a production factor. In this scenario, land rent refers to the more dynamic component of the agricultural sector and it is part of an adjustment strategy that follows strictly production objectives. As a matter of fact, land rent allows to increase farm dimension and to take advantage of scale economies; it permits to increase marginal productivity of other factors used in the firm, first of all the labour; it can allow the introduction of technical innovations or changes in organization, that, in some way, are linked to the production scale. In this sense it can be assumed that farms with rented land have characteristics and organizational elements that are specific and that distinguish them from both less market oriented farms and farms where property is the only way to possess land and where farm dimension is taken as a data.

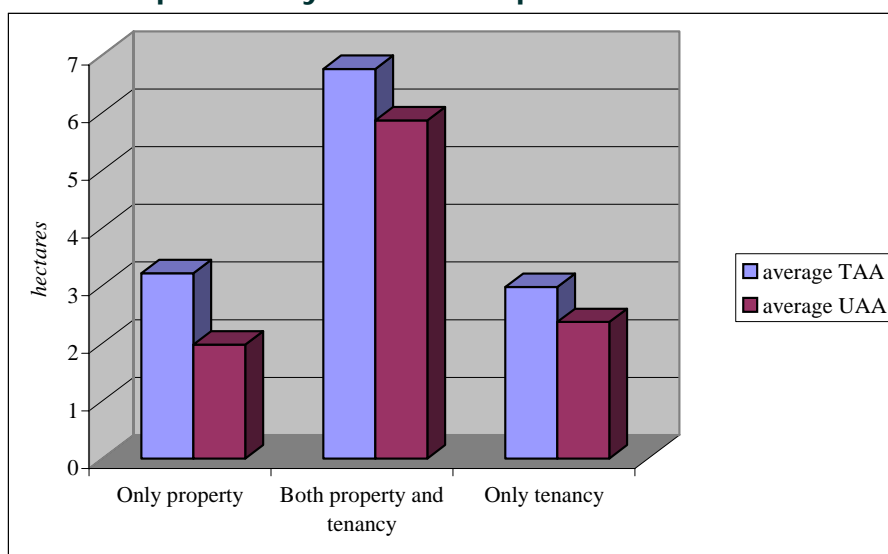
To test this hypothesis and to analyse whether and how land rent could characterize different farm typologies, data of the last agricultural census, referred to the Campania Region, have been processed. Data do refer to each of the farm units that are in of census survey (more than 248 thousands) and they relate to structural and production characteristics (dimension, crops, land-labour and management-property relationship), to farmers socio-economic characteristics (age, education, agricultural employment level), to market relationship. Based on census data Gross Standard Income and Farm Economic Dimension have been assessed for each farm

unit, that are useful in order to better characterize regional farms from an economic point of view and to identify how farm activity plays a more or less production role.

3.2 Farm characteristics in Campania region: an explorative analysis

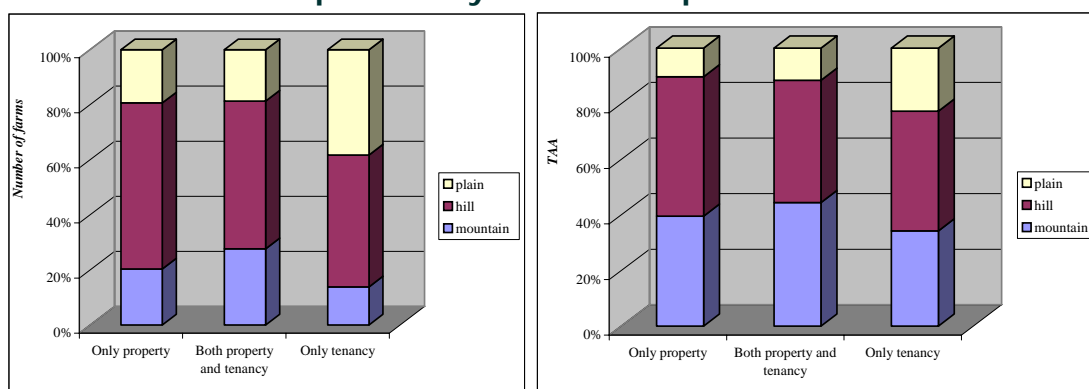
In Campania region farms that have rented land are more than 39 thousands and they account for 16% of the total amount of farms included in the last census survey. More important is the weight they have as area is concerned: they account for the 23%, in terms of total agricultural area (TAA), and for more than 29%, in terms of utilised agricultural area (UAA). The higher weight, as area is concerned, shows the first special point of this farm category, that is its dimension is higher than the regional average is: 5.2 hectares of TAA, related to 3.5 hectares as regional average. More different elements come out when management-property relationship are better analysed. Figure 1 allows to compare structural characteristics of farms when property or land rent are considered. When land rent is occurring, there is a very clear difference between farms that have both property and tenancy (5.8 hectares for farm on average) and those where the land is completely rented (2.4 hectares/farm). In the former ones renting the land is the answer to a strategy of production scale change, as the original farm size is 3.2 hectares of TAA on average and the tenancy allows to make production area twice as much. In figure 1 a second element can be highlighted, that is the higher level of land use when tenancy occurs, proved by the higher ratio UAA/TAA.

FIGURE 1 Campania Region – Average TAA and UAA by Different Ownership-tenancy Relationship



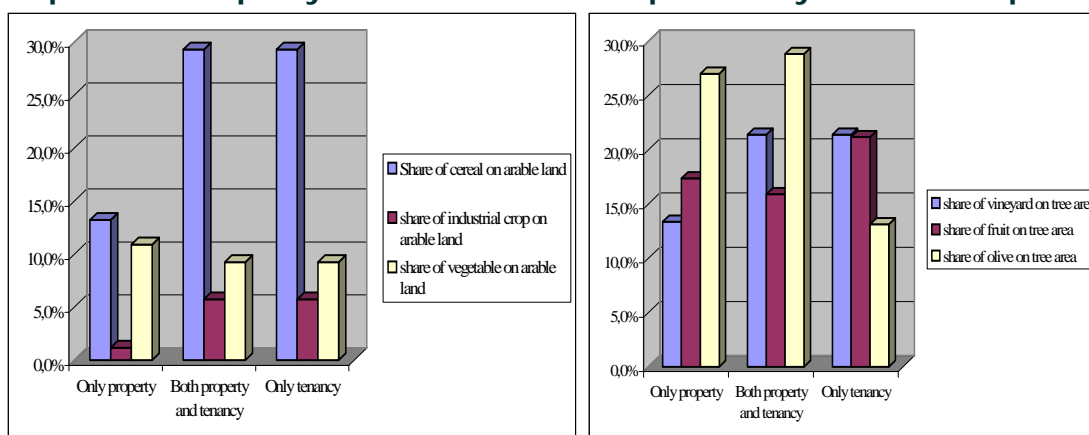
This element could be related to the different site where the farm is located, in addition to different production objectives. By figure 2 it can be pointed out how being located in a plain area has a higher weight as tenancy forms get widely spread. In other words, in plain areas land renting is more important and, generally speaking, resources quality is better in farms with land renting, as 36% and 20% of UAA is in average irrigated respectively in farms with tenancy or partially tenancy lands, while it accounts for 17% when farmer completely owns his cultivated area. That depends on the higher economic profitability agriculture has in plain areas; this is an incentive to do business even if there is nor the property of the land.

FIGURE 2 Share of Farm Number and of TAA by Altitude and by Different Ownership-Tenancy Relationship



Land renting can be related to crop choices, too: there is a specific crop pattern in farms which possess rented land. As time horizon is shorter than in those situation where land-management relationship are more stable ones, arable land represents the higher share of UAA: 50% of UAA in tenancy farms, while 29% in farms with only owned land. Within arable land, two crop patterns can be identified: on one side there are the more extensive farms where cereals prevail, from the other side there are more intensive ones where an important quota of UAA is invested to industrial crops. On the contrary, in farms with rented land trees have a lower weight and account for 30% UAA (43% in farms that own the entire area). Within trees, vineyard and fruits are mainly grown (figure 3).

FIGURE 3 Share of Agricultural Area Cultivated to the Most Important Crops by Different Ownership-tenancy Relationship



As labour- management relationship is concerned, two aspects should be pointed out. First of all, the employment of farmer and of his family is larger when land is rented, secondly in those farms there is a larger extra-family labour, too. Generally speaking, when land is rented farm unit plays a very important employment role; this role is particularly evident when the agricultural area is totally rented (in this case the employment account for 636 days/year). The more professional character of the tenancy can be inferred by the presence of extra-business activity of the farmer and by the relationships on the products market. When land is totally owned the percentage of part time farmers is 26%, while in partially or totally tenancy farm 17% of farmers are part time workers. As market relationship are concerned, 18% of the farms with totally owned land does not sell on the market (4% and 8% in the partially or totally tenancy farms, respectively) and, secondly, the percentage of farms who totally sell the production increases from 13.7% in this first category to 17.5% and 27% in other ones.

Some other information can derive crossing data on renting land and indicators that refer to farms and farmers characteristics. Firstly, the larger is the farm size, the higher is the share of farms with tenancy and that can be explained in two ways: the higher is the initial size, the more professional is the agricultural activity that reflects in a will of development and then in an enlargement of the production scale; the higher is the initial size, the higher is the probability to get an efficient scale of production, thanks to the integration of rented land. To give evidence of the professional level of tenant farms is the strong relationship between land-management relationship and the number of working days: in 45% of farms with totally owned land, working days are less than 50 a year, while the share increases to 16% and 27% in the other two categories. On the contrary, 50% and more of farms with partially rented area work more than 200 days/year. An intermediate situation occurs in totally tenancy farms: 27% of them does not work more than 50 days, while 36% works more than 200 days/year (table 3).

TABLE 3 Number of Farms in Campania Region by Different Ownership-tenancy Relationship and by Number of Working Days

	<i>Range of working days</i>				Total
	up to 50 days	from 51 to 100 days	from 101 to 200 days	200 days or more	
complete property farm	94.254	41.372	31.934	42.298	209.858
both property and tenancy	3.713	3.298	4.266	11.948	23.225
complete rented farm	4.324	2.713	3.040	5.772	15.849
Total	102.291	47.383	39.240	60.018	248.932

Lastly, very important is the relationship between the way the land is possessed and the farmers age: the percentage of farmers under 45 years old is 28% in rented farms, while in completely property farm this share decrease to 18% .

The preliminary explorative analysis shows, then, that renting land is linked to farms that are more professional, have a more intensive crop pattern, have higher probability of development, either because resources quality is higher, and because farm size is larger and the farmer is younger.

3.2.1 Differentiation factors in Campania region agriculture

To better assess how renting land is linked to some variables that showed to be significantly different in farms with different tenancy-ownership level, an econometric model has been implemented where the presence of rented land is function of structural, production and management characteristics. Before that a principal component analysis (PCA) has been carried out taking account a set of variable that could be relevant to influence renting land. This kind of analysis allows to simplify a n -dimensional space, where n is the number of variables initially considered, in a m -dimensional space, with $m < n$, that is the space of the extracted components. Co-ordinates of p observations (in this case the entire set of farms surveyed in Campania region) are then computed in the components space.

PAC allows to get two different objectives. First of all, it synthetizes initial variables in a lower number of indicators that allow to easily analyse the set of aspects taken into account. Secondly, as components are orthogonal it is possible to use them in econometric analyses and to avoid multi-collinearity problems. Variables used in the PCA are listed as follows:

Share of irrigated land
 Number of working days in a year
 Number of working days for hectare of land
 Share of extra-family labour
 Share of arable land
 Share of cereal on arable land
 Share of intensive crop on arable land
 Share of protected area
 Share of trees area
 Share of vineyard on tree area
 Share of DOC vineyard
 Share of fruit on tree area
 Number of cattle units
 Economic dimension of the farm
 Gross Standard Income for hectare

Six components have been extracted that explain 65% of variance of the observed set. That means that using this kind of analysis we lose almost a third of the initial information. Nevertheless, PCA allows an easier reading of differences that characterize regional agriculture, looking to only 6 explaining factors.

The 6 components meaning can be get by the factor scores matrix that shows the correlation coefficients between variables and components.

The first factor refers to the *crop intensity level*, as it is positively correlated to share of irrigated land, to protected area and to vegetable and flower area. The second factor underlines the *difference in crop patterns* and distinguish farms where trees, and particularly fruit, are an important share of the UAA from farms where a major area is cultivated to cereals and to extensive crops. Characters referring to *land productivity* and to cattle presence are included in the third component that is correlated to variables such as Gross Standard Income for hectare, protected area e number of cattle units. *Employment and income dimension* is synthesized in the fourth factor, while a more specific information on *labour-management relationship and on labour intensity* is given by the fifth component, that, when positive, characterizes those farms where the extra-family labour is larger and higher is the number of working days for hectare. Some more information on crop pattern are given by the sixth factor that distinguish farms according to higher/lower presence of vineyard area and of *quality wine production area*.

Then, these 6 components represent synthetic factors that differentiate within the regional agriculture. The following econometric model allows to test whether and how much each of these factors does influence in determining land renting and could help to understand production and management strategies according to different kind of land tenure.

3.3 Key factors of the different strategies of possession of land

Logit model has been implemented to analyse a binary choice situation: farmer's choice between to rent or no to rent land. We suppose probability to choice "to rent land" depends on the technical and land-using characteristics, farmer socio-economic variables, other economic activities close to agriculture, types of production process and interactions with product markets. To reduce these variables a factor analysis was carried out. So we implement logit model using factor scores as covariates.

The logit model notation is:

$$(1) \Pr(y_i=1) = F(\beta' X_i) \quad i=1,2,\dots,n$$

where y_i is the dependent variable that is equal to 1 if there is rented land in the farm and it is equal to 0 otherwise; X_i is covariates vector; β' is a parameters' vector; F is a cumulative distribution. In our case, functional form of F is the logistic.

Logit model is implemented to analyse the effects of the six factors (*crop intensity level*, *difference in crop patterns*, *land productivity*, *employment and income dimension*, *labour-*

management relationship and on labour intensity, quality wine production area) and some categorical variables on the probability to choice tenancy.

Logit model can be written as

$$(2) \Pr(RL_i=1) = F(\beta' CIL_i + \beta' DCP_i + \dots + \beta' QWP_i + \beta' CA_i + \beta' Mark_i) \\ i=1,2,\dots,248,855$$

where

RL - presence/absence of rented land

CIL_i - factor score of *crop intensity level*

DCP_i - factor score of *difference in crop patterns*

LP_i - factor score of *land productivity*

EID_i - factor score of *employment and income dimension*

LBR_i - factor score of *labour-management relationship*

QWP_i - factor score of *quality wine production area*

CA_i - Age of farmers (5 classes)

Mark_i - product marker relationship

Table 4 shows the results.

TABLE 4 – Logit Model for Rented Land Choice

Dependent variable: Rented land			
Number of observations: 248,855			
Correct R-squared: 79%			
<i>Explanatory variables</i>	<i>Coefficient</i>	<i>p-value</i>	<i>Description</i>
Crop intensity level	0.124	0.006	Factor scores
Difference in crop patterns	-0.232	0.006	Factor scores
Land productivity	0.021	0.007	Factor scores
Employment and income dimension	0.457	0.011	Factor scores
Labour-management relationship	-0.203	0.008	Factor scores
Quality wine production area	0.112	0.005	Factor scores
Age	-0.324	0.008	Age is arranged in 5 classes
Market	0.334	0.015	Way to sell product- it is equal to 1 if production isn't totally sold and is equal to 2 if production is totally sold
C	-0.666	0.025	Constant

The important thing to note is that the factors *crop intensity level*, *land productivity*, *employment and income dimension* and *quality wine production area* seem to have a positive effect on probability to choice tenancy to increase farm size. A good product market where it is possible to sell complete production (Mark) have same behaviour. Factors *difference in crop patterns*, *labour-management relationship* and farmers age show negative effects on probability to choice tenancy.

So, rented land seems a valid strategy for farm adjustment especially for younger farmers, for farms characterised by a large share of family work, by quality production and by a strong market oriented production strategy.

4 CONCLUSION

The results show that more dynamic regulation on tenancy could be a right strategy for farm adjustment process.

In Campania Region, farms with rented land are 16%. Farms characterized by tenancy and property are well defined category thanks to the weight they have as area is concerned (they account for 29%, in terms of utilised agricultural area), to their higher average size (5.2

hectares of TAA, related to 3.5 hectares as regional average), to better quality of natural resources and to higher intensity and productivity of labour.

Farmers age and a dynamic production market have a positive effect on probability to choice tenancy.

On the bases of these results, rented land could be a strategy to increase farm size more efficient than others characterized by property of land. A evidence of this potential success is the interest shown by countries in transition economics and developed countries like UK or US for this kind of possession of land (Johnson 2003, Agriculture and Rural Development Committee 1997) .

In Italy, tenancy of agricultural land is starting to develop 20 years after law 203/82 introduction. More information about this regulation to farmers and owners and tenancy introduction in the future political interventions to simplify the change from one generation to another could develop adoption of rent land contracts.

Moreover, results show that the rent could be a useful instrument in order to improve not only farms physical dimension but also that economic through a greater production in physical terms and a qualitative improvement of the supply.

Finally, to avoid a further long period of adoption and spread of an adjustment strategy that seems to be adapted to the requirements of the Italian agriculture, it would be important to analyse now if the tenancy is useful only for intensive agriculture or could be a valid way in order to confer greater economic efficiency to the multifunctional agricultural sector. This part of agricultural sector concurs an economic development which is not simply agricultural but also rural.

REFERENCES

Agriculture and Rural development committee. 1997. *Agriculture in Rural Wales*. National Assembly for Wales. UK

Istat. 2002. *5th Censimento Generale dell'Agricoltura*. Rome

Johnson B. 2003. *Agricultural Land Ownership and Tenure Patterns in Nebraska*. University of Nebraska Cooperative Extension

Maddala G.S. 1983. *Limited Dependent and Qualitative Variables in Econometrics*. Cambridge university Press

Povellato A. (edited by) 1997. *Il Mercato Fondiario*. INEA. Rome