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Volume III

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AGRICULTURAL POLICY AND THE ENVIRONMENT

Proceedings of a Conference Sponsored by

University of Minnesota
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Agricultural Development Regional Agency (ESAV)

University of Padova

Motta di Livenza, Italy
June 19-23, 1989

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Department of Agricultural and Applied Economics

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FORWARD

The papers in this volume are the result of the First Annual
Conference on Agricultural Policy and the Environment, held at Motta Di
Livenza, Italy, June 19-23, 1989. This conference resulted from the
collaboration of the University of Padova, University of Minnesota and the
Ente di Sviluppo Agricolo (the Veneto Regional Development Authority) which
provided the lovely setting for the conference. The University of
Minnesota Center for International Food and Agricultural Policy has entered
into a long-term agreement with these Italian counterpart institutions to
study problems of land use, land values, agricultural production and their
impact on environmental quality. In both countries, the agriculture/
environment linkage is of growing importance.

The conference proceedings are divided into four volumes, according to
the sessions presented.

In the fall of 1990, the Second Annual Conference on Agricultural
Policy and the Environment will be held in Minnesota. We look forward to
repaying the warmth and hospitality of our Italian counterparts. We would
especially like to thank Danilo Agostini, Guisseppe Stellin, Cesare Dosi
and the entire staff of the ESAV research station in Molta di Livenza,
Veneto, and Judy Berdahl for her typing and editorial assistance.

<div align="right">

C. Ford Runge, Director
Center for International Food and
Agricultural Policy

</div>

DEVELOPMENT OF LAND PRICES IN ITALY

by

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I.E.R.Co (Istituto di Estimo Rurale e Contabilità)

1. Objectives and source of data

The aim of this introductory paper is to outline an overall trend of land prices in Italy, related to agricultural uses. Official statistics are compiled by INEA (Istituto Nazionale di Economia Agraria), which also provides information about the value of marketable production and estimates on gross farm incomes (including capital income and independent labour revenue). Trends observed since 1970 are shown in figure 1.

With regard to land prices, time series were revised in 1968, starting from 1956. The new methodology, set up mainly for statistical purposes [1], offers an estimate of "farmland values" over time at a national level, with a breakdown by agrarian zones, covering about 2/3 of the Italian territory (i.e. excluding "forested areas", but including "rough grazing land") (table 2) [2].

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[1] "Since only a small fraction of all the land is sold in any given year" (Dovring, 1982), in accordance with Barnards and Wunderlich's (1984) remarks, a similar procedure was developed in Italy for the setting up of aggregated figures of farmland values (Panattoni, 1976). The purpose of these statistics is really more designed to give general information on land value trends over time, than to give an accurate estimate of the effective price paid for a parcel or a farm sold on the market. Furthermore, because of the land market segmentation, we may observe different "types of values" in Italy (Bazzani, 1987), not only related to actual transactions on the free market: for example (for mortgage loans, administrative, fiscal and legal purposes condamnation procedures, etc.), (Grillenzoni and Occhialini, 1987).

[2] In view to obtain agrarian zones relatively homogenous, the INEA adjusted the cartografy by ISTAT

2. Development at national level

Cyclical movements occurred along the observed period 1956-88. Considering the values in table 1 at constant prices, we may identify:

- three downward trends in the first half of the '60s (from 1959 to 1963), of the '70s (from 1969 to 1971) and of the '80s (from 1981 to 1985);

- two upward trends in the second half of the '60s (from 1964 to 1968) and, with more evidence, of the '70s (from 1972 to 1980).

Several factors have influenced these movements:

i) adverse economic and political conditions (the well-known period of "negative conjuncture"), increasing restraints on land tenure and "stagflation" were likely those which have, mainly and respectively, influenced the three downward trends;

ii) expectations of economic growth, of future profitability of agriculture and possibilities for non-agricultural uses (due to population pressure on land and to related increase of wealth) may explain the upward trends in the inflationary climate of the late '60s and, mostly, of the '70s since 1973.

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(Istituto Centrale di Statistica), dividing farmland by lying position: mountain (internal, coastal); hill (internal, coastal); plain (flat land, valley). Specifically the valley land, which covers only 3% of the surveyed area, is located at the bottom of the Alps and the Appennini ranges (INEA, 1968-1970).

Some of these trends are similar to other EEC countries (the USA too), because of the CAP (Common Agriculture Policy) impact (Grillenzoni and Maunder, 1987). The relative measures may have had the effect of either raising or lowering prices in the farmland market, as well as national variables (fiscal and financial conditions, exploding public debt, etc.) which may have determined different intensities of the observed phenomena (Grillenzoni, 1986).

The slight upward trend for the more recent years (since 1985) might, in particular, be accelerated by the presently changing economic conditions. The expected increase of inflation might produce a new demand of investment in "real" assets (Grillenzoni, 1989).

3. Internal variations

Within the cyclical movements of farmland values at the national level, there are however consistent disparities and dichotomic trends for these values at the regional level. In this context, the Italian regions are significantly better represented by "agrarian zones", according to land altimetry, which offers a certain degree of homogeneity, than by the geographic regions.

To comprenend this assumption correctly, I would suggest examining the following (and diversified) percentages of distribution of the Italian territory, by altimetrical zones (figure 2) and agrarian zones (table 2):

4

Zones	Altimetrical [3]	Agrarian
	(over a surface of 29.5 million Ha)	(over a surface of 20.8 million Ha)
- Mountain	35	26
- Hill	42	36
- Plain	23	33
	---	---
	100	100
	---	---

The residual national surface of approximately 8.7 million hectares was covered in 1983 by "woods" (21.7%), "urbanized areas" (6.9%), rocks, mines, etc. (Merlo, 1988).

A close investigation of the figures in table 2 reveals that, from 1968 to 1987, current farmland values increased more in the plains and valleys (6.9 times and 10 times respectively) in comparison with the average (weighted) national trend (6.1 times). On the other hand, the increase was only about 3.5 times in the mountain zones and 4.5-5.8 times in internal/coastal hills. In real terms, the regional disparities are even more significant.

These regional imbalances can be mostly explained by the land use adjustments and structural changes which occurred in farming and in rural areas, due to economic development, not exclusively contined to the agricultural sector.

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[3] Both surfaces exlude internal waters.

Many authors have analized these phenomena, from the general economic development side (Di Sandro, 1972 and 1977, Di Cocco, 1976 and Medici, 1976) and/or from the land use dynamics side (Grillenzoni, 1980, Agostini, 1984, and Merlo, 1981 and 1984).

The decreasing farmland values in the less favoured areas are certainly derived from more extensive processes related to the reduction of active agriculture, which is due to the cost inflation and the exodus of population, both of which considerably reduced the area of arable land, mainly along the Appennini range (Di Cocco, 1978 and CNR, 1982).

The increasing farmland values in the plains are due, on the other hand, attributable to intensification processes since good soils, irrigation facilities and accessibility permit constant technological advancement and, in some areas, a structural evolution of farming (Barbero and Mantino, 1988). In this context, we may point out that almost 3/4 of the added value of the agricultural sector is actually achieved from less than 1/4 of the "best" farmland in Italy. In addition, in these plain areas, there has been a relevant and continuous demand for land, supported by financial corporations, insurance companies and public authorities, for industrial, residential and social investment (Grillenzoni, 1982 and Prestamburgo, 1982).

In consequence, an increasing awareness for a new land planning policy has thus emnerged (Merlo, 1979 and

Galizzi, 1981), suggesting methodological proposals whose aim is to protect the use of the "best" farmland in the plain areas. (Franceschetti and Tempesta, 1983, Boatto et al. 1987). On the other hand, judging from statistical information concerning the '80s, we may finally observe a slight rise in values in the mountain and hill areas located primarily on the coast (tourist effect), secondly in internal zones both of which are probably due to a "new" demand for land for residential and recreational uses.

What about the effect of the EEC set-aside program for internal rural areas? Might it support a minimum level of stable population at a reasonable standard of living (Amadei, 1989) ?

4. Concluding remarks

The response to these questions is not feasible in the context of this short but fairly referenced paper, which has mainly focused on land price development [4].

Certainly, the consideration:

i)   of competition for land between agricultural and

        urban systems in the more congested areas of plain

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[4] The EEC set-aside program, just started this year, might produce adjustments - in the near future - in terms of farmland values too, but the response cannot actually be quantified by an "ex-ante" valuation. For other economic aspects of set-aside see the interesting reports:
- by O.Ferro, C.F.Runge and H.von Witzke, prepared for the Congress held in Padova, may 1989;
- by G.Amadei, G.Barbero and E.Di Cocco, printed by "Genio Rurale", n.5, 1989.

(CNR, 1988), and

ii)   of multipurpose agriculture and forestry in the

     less favoured areas (Merlo et al. editors, 1987),

would be analized in an enlarged perspective, not only

market-oriented, but also taking into account

environmental features, for which market prices do not

seem to be the "best" indicators. In other words, we need

new data and statistical information "valuing land

outside the market sector" (Raup, 1982).

     This would be "one area in which - quoting Raup's

suggestion (ibidem, page 95) - fruitful exchanges could

take place" within the University of Minnesota and Padova

agreement.

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Table 1. AVERAGE LAND PRICES IN ITALY FOR AGRICULTURAL USES (a)

YEARS	ACTUAL PRICES			CONSTANT PRICES 1985 (b)		
	000 Lit/Ha	Index	Var. %	000 Lit/Ha	Index	Var. %
1956	568	100	-	4571	100	-
57	554	98	-2,5	4963	109	8,6
58	549	97	-0,9	5006	110	0,9
59	548	96	-0,2	5150	113	2,9
60	519	91	-5,3	4833	106	-6,2
1961	501	88	-3,5	4656	102	-3,7
62	507	89	1,2	4573	100	-1,8
63	521	92	2,8	4467	98	-2,3
64	549	97	5,4	4555	100	2,0
65	592	104	7,8	4833	106	6,1
1966	647	114	9,3	5203	114	7,7
67	655	115	1,2	5278	115	1,4
68	741	130	13,1	5948	130	12,7
69	750	132	1,2	5794	127	-2,6
70	723	127	-3,6	5206	114	-10,1
1971	720	127	-0,4	5014	110	-3,7
72	797	140	10,7	5333	117	6,4
73	971	171	21,8	5514	121	3,4
74	1243	219	28,0	5014	110	-9,1
75	1448	255	16,5	5380	118	7,3
1976	1721	303	18,9	5204	114	-3,3
77	2042	360	18,7	5296	116	1,8
78	2484	437	21,6	5943	130	12,2
79	3176	559	27,9	6578	144	10,7
80	3998	704	25,9	6901	151	4,9
1981	4327	762	8,2	6405	140	-7,2
82	4169	734	-3,7	5418	119	-15,4
83	4160	732	-0,2	4928	108	-9,0
84	4159	732	0,0	4464	98	-9,4
85	4220	743	1,5	4220	92	-5,5
1986	4270	752	1,2	4308	94	2,1
87	4525	797	5,9	4448	97	3,2
(c) 88	4840	852	7,0	4542	99	2,1

(a) Excluding "wooded areas", but including "rough grazing land".

(b) For conversion, ISTAT coefficients have been utilized related to gross market prices index.

(c) Provisional

Source: Estimates by INEA, Rome.   12

Table 2 . VARIATIONS IN FARMLAND PRICES BY AGRARIAN ZONES

AGRARIAN ZONES	Actual prices (000 Lit per ha)					
	1968	1972	1976	1980	1984	1987
MOUNTAIN						
- internal	192	187	257	562	624	670
- coastal	580	599	897	1648	1846	1943
HILL						
- internal	487	509	896	1899	2050	2188
- coastal	639	695	1243	2839	3398	3705
PLAIN						
- flat land	1436	1564	3799	9121	9120	9902
- valley	1239	1399	3230	9369	10844	12409
ITALY	741	797	1721	3998	4159	4525

AGRARIAN ZONES	% (a)	Index of values by zones					
		1968	1972	1976	1980	1984	1987
MOUNTAIN							
- internal	25	26	23	15	14	15	15
- coastal	1	78	75	52	41	44	43
HILL							
- internal	25	66	64	52	47	49	49
- coastal	11	86	87	72	71	82	82
PLAIN							
- flat land	30	194	196	221	228	219	219
- valley	3	167	175	188	234	261	274
ITALY	100	100	100	100	100	100	100

(a) Relative importance of zones over a surface of 20.8 million
    hectares (2/3 of the Italian territory).

Source : Estimates by INEA, Rome.

Figure 1 – TREND OF LAND VALUES AND GROSS FARM INCOMES IN ITALY
(Indexes of actual data, 1970 = 100)

FARM LAND VALUES

GROSS FARM INCOMES

(a)
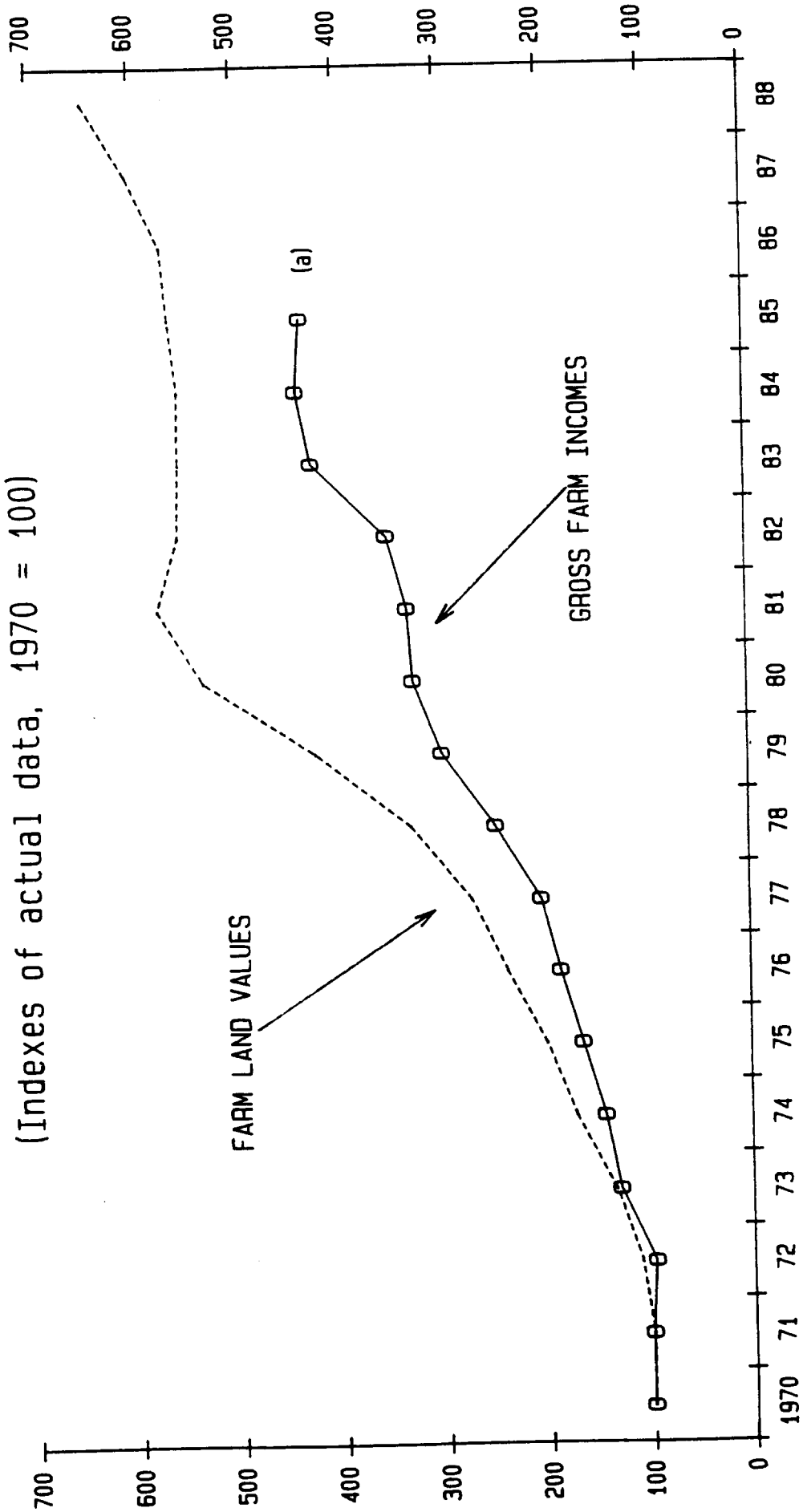
(a) Data not available after 1985

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FIGURE 1 - SKETCH OF THE ITALIAN TERRITORY , BY ALTIMETRICAL ZONES

ZONES

MOUNTAIN (35 %)

HILL   (42 %)

PLAIN   (23 %)
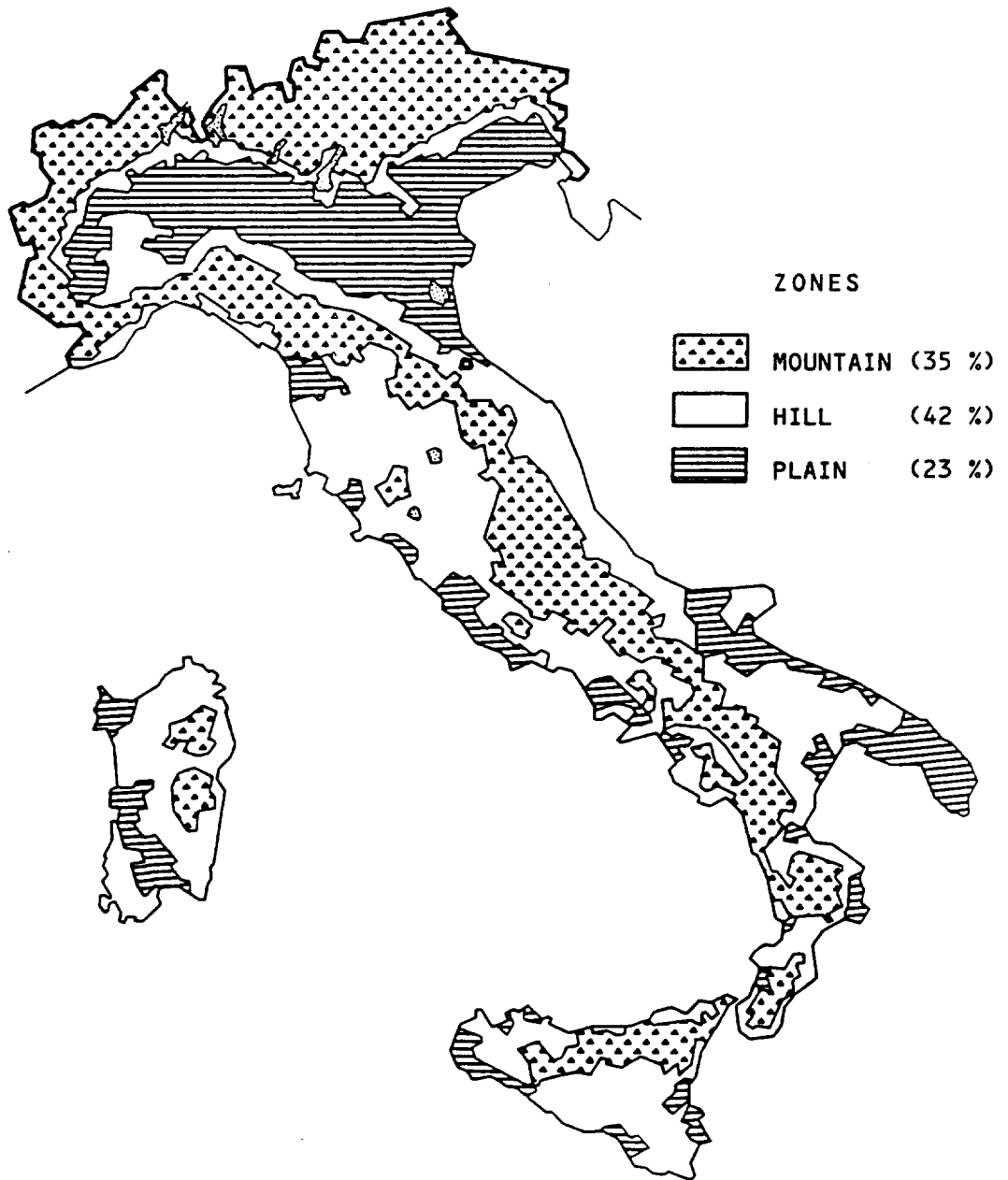
LAND PRICES AND FARM INCOMES IN EMILIA-ROMAGNA

by

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1. Objectives and sources of data

The experimental results presented in this paper have emmerged from a research project, just completed by the authors, within the institutional activities carried out by Ce.R.C.A.-I.E.R.Co. (Bregoli et al., 1976 and 1984).

According to the defined methodology of the research project, the objectives of this paper may be listed as follows:

a) to verify the correlation between fixed assets and farm incomes, identifying cyclical movements along the observed period 1974-85 (Grillenzoni e Occhialini, 1986);

b) to quantify the profitability of different types of farm, giving an overall measure of returns on fixed assets and a tentative evaluation of specific returns on working capital and on farmland value, including improvements reintegration.

Data on farm incomes and working capitals come from a sample of almost fifty farms surveyed by the "Accounting Office" of I.E.R.Co. and located in the middle-east plain of the Emilia-Romagna region. This is a peculiar area, one of the most developed in Italy, with a very intensive agriculture [1]. All the farms are fairly

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[1] The value of the agricultural production varied from 3.5 to 4.2 million lire/ha for FCF; from 4.9 to 5.6 million lire/ha for MLF; from 6.6 to 8.8 million lire/ha for HF during the '80s at constant prices 1985.

large sized (60-180 hectares) and directly managed by the owner with hired labour.

The farms can be divided in three relatively homogeneous groups, in accordance with the main land utilization:

. FCF - Field Crops Farms: crops (cereals, sugar beets, soybeans, etc.) represent about 80% of the farm acreage, and participate in the same percentage to the gross income formation;

. HF - Horticultural Farms: orchards and vineyards cover about 80% of the farm acreage, and participate in the same percentage to the gross income formation;

. MLF - Mixed Livestock Farms: fields crops and forage culti-vation (4/10) cover more than 80% of the farm acreage. Livestock is mostly given by dairy and pig breeding.

Data on farmland values come from "Land Prices Bank" information system (Grillenzoni and Bazzani 1988), operating at I.E.R.Co., which selected market prices for similar farms, related to "bona fide transactions".

Basic data on fixed assets and on farm incomes are reproduced in tables 1 and 2.

2. Overall analysis

The first step of the present farm analysis deals with the ratio:

$$r = \frac{GFI}{FA} = \frac{\text{Gross Farm Income}}{\text{Fixed Assets}}$$

where:

r = Average rate of return for the whole sample

GFI= Land and capital income before depreciation

FA = Farmland value plus working capital (machinery, livestock and financial capital).

Time series analysis indicates three cycles in accordance with those showed at the national level (Grillenzoni, 1989). In detail:

1° cycle 1974-77, r = 3.0 percent;

2° cycle 1978-81, r = 1.7 percent;

3° cycle 1982-85 (and, likely, over 1985), r = 4.6 percent.

The graphic analysis, which also uses a regression test (figure 1), shows a definite correlation between fixed assets and gross farm incomes for the first and the third cycle. In the intermediate period (1979-82), the exploding increase of farmland values seems to be more correlated to the general economic conditions (inflationary climate) than to the profitability of agriculture (figure 2) [2], with specific respect to the types of farm under consideration [3].

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[2] The Merlo and Rosato paper, presented in this Conference, offers greater insight into the relationship between farmland values and correlated variables, specifically for those exogenous to the agricultural sector.

[3] Comparative research has been carried ou, focusing

3. Rates of return

Quantitative research on rates of return has been well developped in the recent US publications (Barry and Robinson, 1986 and Irvin et al. 1988), but has been rather neglected in the Italian literature, because of the lack of basic information.

Therefore, in this context, this contribution assumes particular significance in our opinion, also for agricultural policy implications.

Following the methodology set up by Bazzani and Grillenzoni (1989), an evaluation of tentative disaggregation concerning farm incomes (after machinery depreciation at the average rate of 10 percent) has been carried out, appraising specific returns on working capital and on farmland value.

The approach, concerning two groups of farms (FCF and HF, MLF having shown critical situations in the second period and poor economic results as a whole) might be questionable, but it seems to be useful from an operative point of view for political purposes (fiscal, financial, etc.).

The basic hypothesis is to repay working capital on an average rate of 8 percent over time, according to

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financial aspects and offering interesting findings on the changing farm structure by Lowenberg De Boer and Boelhje (1986) and by Harrison and Tronter (1989). A richer theoretical framework, presented by Olson and Boehlje in this Conference, merits future investigation.

relevant elements which took place during the observed period (EEC directive no.159/1972; assessed incomes revision 1978-79). Given this hypothesis, the residual return on farmland value (including improvements reintegration) has been estimated as follows (table 3 and figure 3):

Periods	FCF	HF
1974-78	2.10%	4.92%
1979-82	1.41%	1.46%
1983-85	3.65%	4.60%
Weighted average	2.15%	3.52%

Finally, for the third cycle characterized by a recovery of agricultural profitability associated to diffused processes of farm adjustment, due to technological innovation and CAP adaptation (prices support system, environmental restraints, etc.), we may try to estimate the improvements reintegration.

Assuming a return on farmland value at the minimum rate of 2 percent (Italian Law no.153/1975), the payback periods for fixed improvements (buildings, drainage and irrigation equipment, plantations, etc.) vary from 7 years (for FCF) to about 14 years (for HF).

These research outcomes have experimental significance within the observed farms and cannot be generalized to cover the entire agricultural sector of Emilia-Romagna [4].

[4] With regard to the structural evoltion of agriculture within this region and Italy as a whole, useful analyses have been developped, respectively, by Zuppiroli (1989) and by INEA (1987).

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TABLE 1. Components of fixed assets (at constant prices 1985)

Years	Farmland values (1)		Working capitals (2) (a)		Total fixed assets (3)=(1)+(2)		Ratio land/assets (1:3)
	000 Lit/ha	var. %	000 Lit/ha	var. %	000 Lit/ha	var. %	%
1974	16 064	-	3 273	-	19 338	-	83.07
75	20 055	25	3 816	17	23 871	23	84.01
76	22 861	14	3 341	-12	26 203	10	87.25
77	26 866	18	4 447	33	31 313	20	86.80
78	30 893	15	5 017	13	35 910	15	86.03
1979	32 532	5	4 529	-10	37 061	3	88.78
80	36 698	13	4 438	-2	41 136	11	89.21
81	28 632	-22	3 794	-15	32 426	-21	88.30
82	24 964	-13	3 736	-2	28 700	-11	87.98
1983	20 799	-17	3 699	-1	24 498	-15	85.90
84	17 994	-13	3 374	-9	21 369	-13	84.21
85	19 083	6	3 074	-9	22 157	4	86.13

(a) Include: machinery, livestock and financial capital.

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TABLE 2.   Farm indicators   (at constant prices 1985)

Years	Farm receipts		Farm expenses		Gross farm incomes (a)		Rate of return on fixed asset
	000 Lit/ha	var. %	000 Lit/ha	var. %	000 Lit/ha	var. %	(%)
1974	3 186	-	2 689	-	497	-	3.57
75	4 109	29	3 258	21	851	71	4.57
76	3 929	-4	3 235	-1	693	-19	3.65
77	5 272	34	4 368	35	904	30	3.89
78	5 634	7	4 535	4	1 099	22	3.06
1979	4 886	-13	4 301	-5	585	-47	2.58
80	5 090	4	4 729	10	362	-38	1.88
81	4 711	-7	3 915	-17	796	120	2.45
82	4 951	5	4 290	10	660	-17	2.30
1983	5 184	5	4 035	-6	1 149	74	5.69
84	4 852	-6	3 803	-6	1 049	-9	5.91
85	4 402	-9	3 431	-10	970	-8	4.38

(a) Land and working capital income before depreciation.

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TABLE 3. Disaggregation of farm incomes (at constant prices 1985)

Years	Farm income (a)				Estimates by type of farm					
	Total	FCF	HF	MLF	FCF			HF		
					Return on working capital (b)	Residual return on farmland value		Return on working capital (b)	Residual return on farmland value	
	000 Lit/ha	000 Lit/ha	000 Lit/ha	000 Lit/ha	000 Lit/ha	000 Lit/ha	% (c)	000 Lit/ha	000 Lit/ha	% (c)
1974	311	648	784	94	154	494	3.09	304	480	2.28
75	650	818	1 414	393	198	620	3.10	395	1 019	4.44
76	535	742	375	384	183	559	2.46	410	-35	..
77	695	294	3 386	77	245	49	0.18	424	2 962	9.34
78	843	980	2 823	-169	273	707	2.33	470	2 353	6.49
1979	357	665	951	-296	236	429	1.35	392	560	1.48
80	157	435	967	-457	232	203	1.56	388	579	1.42
81	620	945	736	95	181	764	3.72	351	385	1.21
82	506	521	967	34	205	316	1.28	480	488	2.79
1983	988	1 000	1 667	218	213	787	4.85	454	1 213	5.29
84	909	959	1 028	372	210	749	4.26	417	611	3.04
85	835	704	1 583	394	189	515	3.84	366	1 217	5.28

(a) After machinery depreciation at a rate of 10% ;
(b) Based on 8% of working capital;
(c) Ratio to farmland value including improvements reintegration.

FCF = Field Crops Farms;   HF = Horticultural Farms;   MLF = Mixed Livestock Farms.

Figure 1 – CORRELATION BETWEEN FIXED ASSETS (a) AND FARM INCOMES (b)
(Sample of 46 farms, Emilia-Romagna; actual prices 1974-85)

$C = 2075.76 + 19.64 \, R_c \, (r^2 = 0.972)$
(1.359)
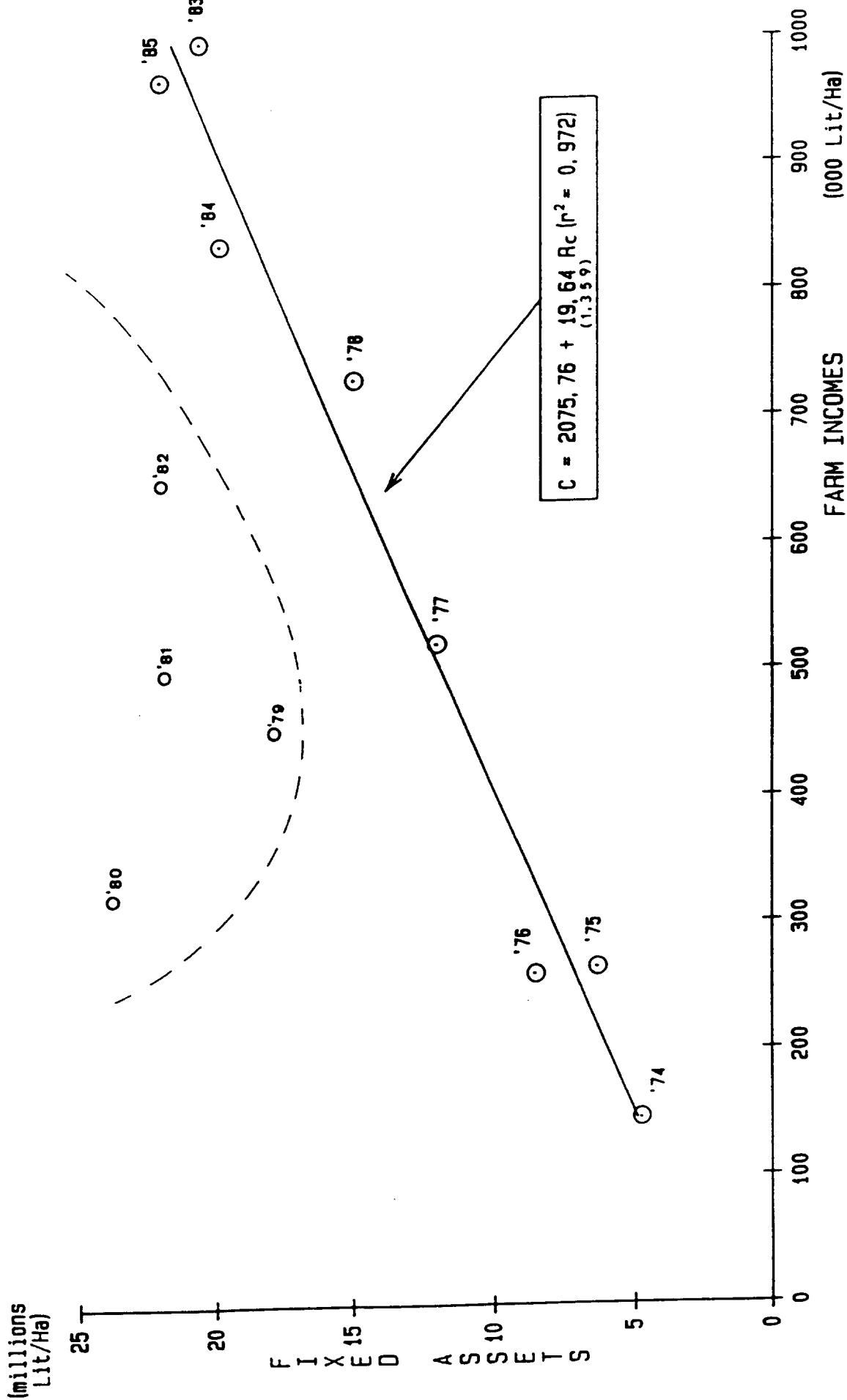
(a) Including working capital   (b) Before depreciation

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Figure 2 – TREND OF FARM VALUES AND FARM INCOMES

(Sample of 46 farms in Emilia-Romagna)

(000 Lit./Ha at constant prices 1985; 3 year moving average)

Total fixed assets

Farm incomes

Farmland values

Figure 3 - RETURNS ON FARMLAND VALUE AND ON WORKING CAPITAL, BY PERIOD AND TYPE OF FARM

FARMLAND MOBILITY AND VALUES BY TYPES OF LAND USE:

A CASE STUDY IN A PROVINCE OF EMILIA-ROMAGNA

by

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1. Objectives, limitations and source of data.

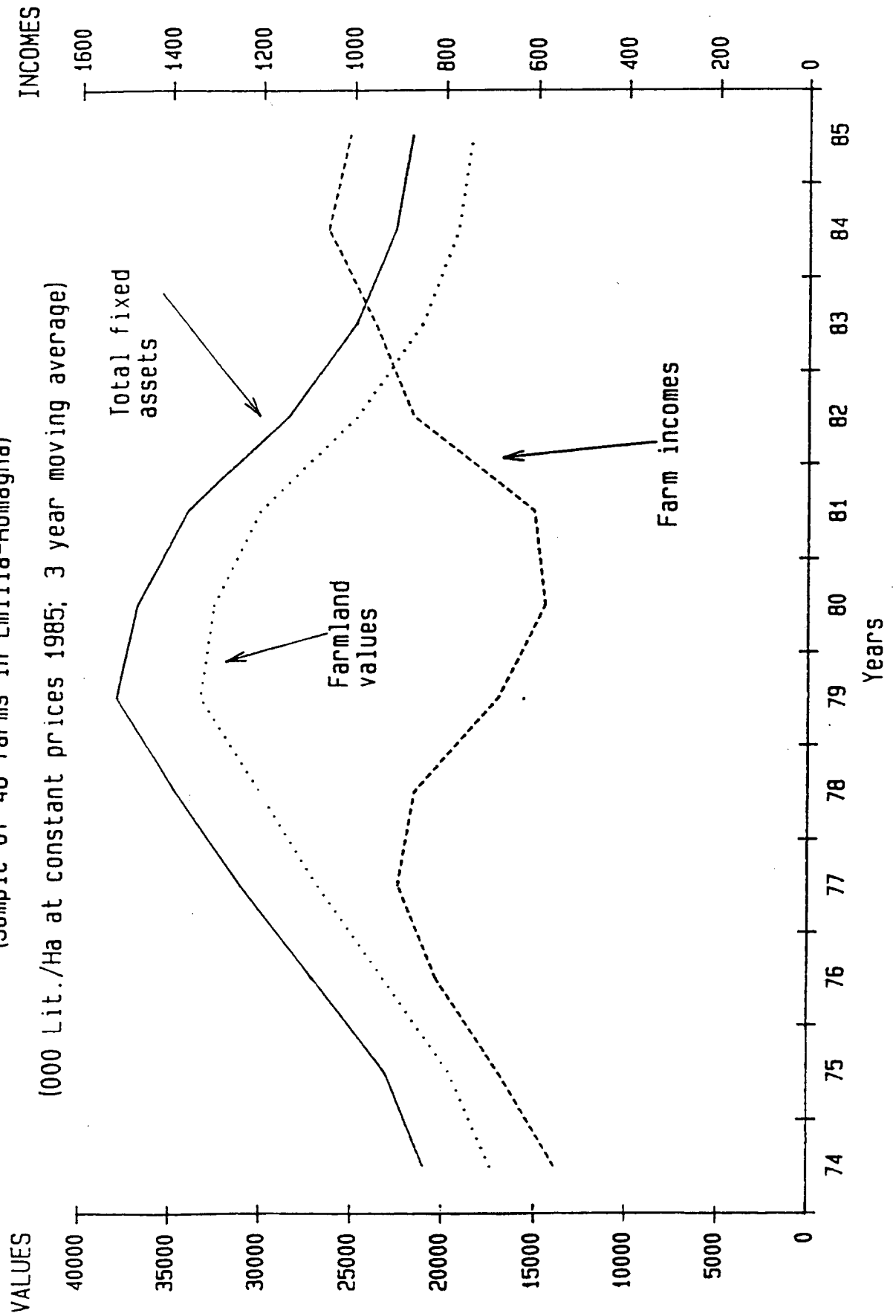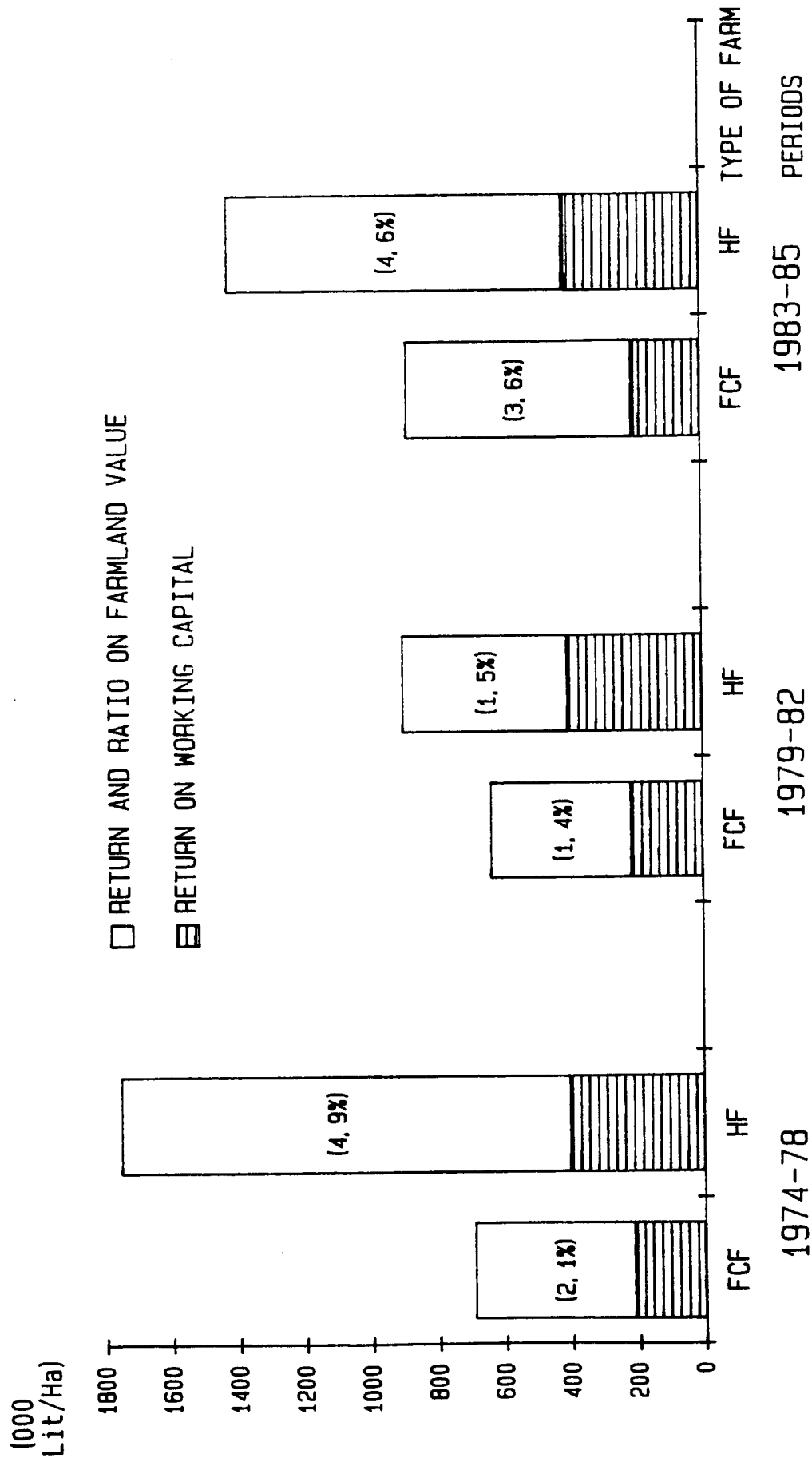Formation and/or consolidation of owner-occupier farms have a long tradition and an increasing role within Italian agriculture. But we know little about these processes outside of the official statistics of each Agricultural Census (Barbero and Mantino, 1988).

Many socio-economic aspects concerning the above mentioned processes have been taken into account in a research project being carried out by I.E.R.Co. in co-operation with the local agricultural offices (SPAA=Servizi Provinciali Agricoltura e Alimentazione) of several provinces of the Emilia-Romagna region.

The case study, which we wish to present here, is necessarly limited to the more significant results for the Ravenna province during a six-year period of observations: 1983-88.

Basic data, surveyed at the SPAA of Ravenna using the "Land Prices Bank" techniques (Grillenzoni and Bazzani, 1988), include:

i) detailed information on land transfers involving owner- occupiers, either as individual purchasers or as associated purchasers (i.e. farming co-operatives = "co-operative di conduzione terreni");

ii) estimated "use" values, as an average between market prices and capitalized income values.

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2. Transfers analysis

During the survey period, land transactions were 2,245 and concerned more than 12.5 thousands hectares (see table 1). Intra-family transfers covered about 23% of the total.

Changes in farmland ownership amounted to an annual quota of 1.3% on the total surface devoted to agricultural and forestal uses. The degree of land mobility varied over time: it was higher in 1983, 1985 and 1988; lower in the remaining years (see figure 1). At the same time period, the average degree was quite different among communes: it ranged from .9% to 2.2%.

An average size of 5.6 hectares was recorded for the whole province, ranging from about 5 hectares in the plain areas to about 12 hectares in the hill areas.

The size differentiation has been fairly significant from the type of purchaser:

i) the new owner-occupied farms (what we call "formation") were about 37% of the total transactions, with an average size of 6.3 hectares in the plain and 16.3 hectares on the hill;

ii) the consolidation of already existing farms (strictly speaking, enlargement of farm size), covering the 63% of the total, recorded an average size of 4.3 hectares in the plain and 7.5 hectares on the hill. On the basis of these purchases, the average farm size has been raised up to 18.4 hectares in ithe plain and to 20.5 hectares on

the hill. Let us point out that these farm sizes are larger than the EEC average.

Many other aspects might be indicated, as far as professional qualification and family components are concerned. We would just like to stress the fact that purcharers under 40 years old increased from 41% (1983-85) to 60% (1986-88). Specifically, from 38% to 59% in the plain, from 58% to 67% in the hill (table 2 and figure 2).

Two other issues should be emphasized. The first one is related to the enforcement of pre-emption rights [1]. Between the two considered periods a sharp decrease was recorded in this kind of purchase (table 3 and figure 3). They represented about the 75% of the total in 1983-85, the 65% (56% on surface basis) in 1986-88. The second issue concerns the support of credit in purchases (Grillenzoni and Gallerani, 1988). As shown by table 4 and figure 4, the share of purchasers who benefit from credit support in plain areas is practically the same as in 1983-85 and 1986-88, while it is very different with regard to hill areas.

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[1] The right was first introduced to the farmer working the purchased land (law 590/65), then broadened to farmers owning land contiguous to that for which purchase had been arranged (law 817/71). This right was eventually conceded to farmers who had been renting land for the previous two years (law 265/76)

3. Land uses and values

If transactions are analysed by the main combinations of land uses, we can observe a fairly definite behaviour of the purchasers in the plain and on the hill.

In flat areas preferences have been devoted, moving from 1983-85 to 1986-88:

- to arable land units (from 30.5% to 35.8%), probably due to the flexibility that this type of land offers with respect to many options, associated to lower prices;

- to specialized units of orchards and/or vineyards, due to the expectations of higher profitability, associating capital investiment with family labour.

In the hill areas, within the same two periods, preferences have been devoted to the more extensive types of uses: arable land variously combined with pasture and/or woods moved from 22.4% to 43.5% of the total. Many factors may have influenced this trend (limited financial resources, cattle breeding aptitute of the younger owner-occupiers, etc.). In any case, this phenomenon seems to be correlated to the EEC directive no.1790/87, which offers incentives toward extensivation processes.

The enclosed figures (table 5) give a clear picture of farmland values movements and diversification by main type of land use.

Average values by altimetric zones increased - from

1983-85 to 1986-88- by 28% in the plain, but decreased by 7% on the hill.

If we focus on the last three years, a diffused increase of farmland values occurred in both the altimetric zones (figure 5). On the average, farmland values moved from 27.5 millions Lit/Ha to 32.3 millions Lit/Ha (+17.6%) in the plain, and from 7.9 millions Lit/Ha to 10.4 millins Lit/Ha (+31.3%) on the hill.

Analysing these values we discovered that they had a direct relationship to land uses. It is possible to single out the link between them in figure 6, where the average land value and the percentage pertaining to orchards and vineyards on purchased land in different communes have been reported.

A through examination was then carried out by means of a more appropiated statistical analysis of data. This study was respectively divided into plain and hill area purchases.

As a first step, widespread analysis of the degree of association between the main farm and purchaser features and values was undertaken. To this effect we used different methodologies in accordance to the kind of data concerned (continuos, dummy or categorical variables). Here we found out a high level of association/correlation for some of the examined variables. An explanatory model was then developed in order to single out the relationship between land price and some continuous and dummy variables related to farm

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features. Results were deceptive for the price model of plain areas, which failed to reach a suitable level of statistical parameters (R-square around 50% even if the probability related to the F-test was always less then 1%). A more positive outcome was seen in the model for purchases in hill areas. Here we found very simple functions in which land prices were strictly related to land uses and farm features. Those are:

a) P = 93.41 AL + 296.49 OR + 159.42 VY - 1935.61 LS + 4547.46 RC

      **   **   **   *   **   R2=0.87

b) P = 80.32 AL + 299.91 OR + 153.87 VY + 4164.83 RC

      **   **   **   **   R2=0.86

c) LP = 0.073 AL + 0.102 OR + 0.067 VY + 2.444 LS + 1.928 RC

      **   **   **   **   **   R2=0.95

d) LP = 0.097 AL + 0.096 OR + 0.077 VY + 2.609 RC

      **   **   **   **   R2=0.90

* => t>0.05; ** => t>0.01

where:

P = land price;

LP = logarithm of land price;

AL = percentage of land classified as arable land;

OR = percentage of land classified as orchard;

VY = percentage of land classified as vineyard;

RC = a dummy variable (0/1) which express bad/good connections with road network;

LS = a dummy variable (0/1) which express steep/slight land sloping.

Even if limited to the context of the presented

case study, these results seem to be consistent with those observed at the national level.

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TABLE 3. Land transfers for consolidation of owner-occupied farms in the province of Ravenna

	1983-85			1986			1987			1988			1986-88		
	No	Ha	Ave.size	No	Ha	Ave.size	No	Ha	Ave.size	No	Ha	Ave.size	No	Ha	Ave.size
- PLAIN AREAS -															
1 LAND TRANSFERS	1.136	5.548	4,88	293	1.372	4,68	306	1.478	4,83	310	1.785	5,76	909	4.635	5,10
A NEW OWNER-OCCUPIERS	434	2.547	5,87	103	677	6,57	97	629	6,48	89	658	7,39	289	1.963	6,79
B FORMERLY OWNER-OCCUPIERS	702	3.001	4,28	190	695	3,66	209	849	4,06	221	1.128 (a)	5,10	620	2.672	4,31
2 LAND OWNED BY FORM. OWN.-OCCUPIERS	702	10.265	14,62	190	1.830	9,63	209	1.377	6,59	221	5.175 (b)	23,41	620	8.382	13,52
* TOTAL 1B+2	702	13.266	18,90	190	2.525	13,29	209	2.226	10,65	221	6.302	28,52	620	11.054	17,83
** 1+2	1.136	15.813	13,92	293	3.202	10,93	306	2.855	9,33	310	6.960	22,45	909	13.017	14,32
- HILL AREAS -															
1 LAND TRANSFERS	94	880	9,36	26	380	14,63	43	506	11,76	37	587	15,87	106	1.473	13,90
A NEW OWNER-OCCUPIERS	49	646	13,17	10	207	20,73	17	276	16,21	21	449	21,39	48	932	19,42
B FORMERLY OWNER-OCCUPIERS	45	235	5,21	16	173	10,81	26	230	8,85	16	138	8,61	58	541	9,33
2 LAND OWNED BY FORM. OWN.-OCCUPIERS	45	473	10,51	16	261	16,33	26	382	14,70	16	217	13,54	58	860	14,83
* TOTAL 1B+2	45	708	15,72	16	434	27,15	26	612	23,56	16	354	22,15	58	1.401	24,16
** 1+2	94	1.353	14,39	26	642	24,68	43	888	20,65	37	804	21,72	106	2.333	22,01
- ALL -															
1 LAND TRANSFERS	1.230	6.428	5,23	319	1.752	5,49	349	1.984	5,68	347	2.373	6,84	1.015	6.108	6,02
A NEW OWNER-OCCUPIERS	483	3.192	6,61	113	884	7,82	114	905	7,93	110	1.107	10,06	337	2.895	8,59
B FORMERLY OWNER-OCCUPIERS	747	3.236	4,33	206	868	4,21	235	1.079	4,59	237	1.266 (a)	5,34	678	3.213	4,74
2 LAND OWNED BY FORM. OWN.-OCCUPIERS	747	10.738	14,38	206	2.092	10,15	235	1.759	7,49	237	5.391 (b)	22,75	678	9.242	13,63
* TOTAL 1B+2	747	13.974	18,71	206	2.960	14,37	235	2.839	12,08	237	6.657	28,09	678	12.455	18,37
** IN ALL 1+2	1.230	17.166	13,96	319	3.844	12,05	349	3.743	10,73	347	7.764	22,37	1.015	15.351	15,12

(a) 247 hectares were purchased by cooperatives (10 obs). Land purchases by farmers not associated interested over 880 hectares, with an average size of 4.17 hectares per transfer.

(b) This datum includes a surface of over 3,000 hectares owned by cooperatives. Excluding this surface, the residual is equal to 2086 hectares, with an average size of 9.89 hectares per owner-occupier.

TABLE 2. Purchasers by age classes

	1983-1985				1986-88			
	No	% (1)	Ha	% (2)	No	% (1)	Ha	% (2)
- PLAIN AREAS -								
- 30 years	141	12,5	798	15,6	211	23,5	1.335	30,8
30 / 35 years	110	9,8	566	11,1	125	13,9	651	15,0
35 / 40 years	141	12,5	601	11,8	109	12,2	562	13,0
40 / 45 years	164	14,6	916	18,0	136	15,2	562	13,0
45 / 50 years	195	17,3	940	18,4	102	11,4	456	10,5
50 / 60 years	262	23,3	959	18,8	156	17,4	573	13,2
+ 60 years	112	10,0	319	6,2	58	6,5	191	4,4
* All	1.125	100,0	5.099	100,0	897	100,0	4.329	100,0
- HILL AREAS -								
- 30 years	14	14,9	173	19,6	27	25,7	428	29,5
30 / 35 years	13	13,8	161	18,3	16	15,2	198	13,7
35 / 40 years	17	18,1	182	20,6	15	14,3	358	24,7
40 / 45 years	7	7,4	95	10,8	13	12,4	121	8,3
45 / 50 years	14	14,9	113	12,8	11	10,5	89	6,1
50 / 60 years	20	21,3	127	14,4	16	15,2	218	15,0
+ 60 years	9	9,6	30	3,4	7	6,7	41	2,8
* All	94	100,0	880	100,0	105	100,0	1.453	100,0
- ALL -								
- 30 years	155	12,7	970	16,2	238	23,8	1.762	30,5
30 / 35 years	123	10,1	727	12,2	141	14,1	849	14,7
35 / 40 years	158	13,0	783	13,1	124	12,4	920	15,9
40 / 45 years	171	14,0	1.012	16,9	149	14,9	683	11,8
45 / 50 years	209	17,1	1.053	17,6	113	11,3	545	9,4
50 / 60 years	282	23,1	1.086	18,2	172	17,2	790	13,7
+ 60 years	121	9,9	349	5,8	65	6,5	231	4,0
* All	1.219	100,0	5.979	100,0	1.002	100,0	5.782	100,0

(1) Percentage on the land transactions in every area
(2) Percentage on the transferred land in every area

TABLE 3. Land transfers, distinguishing different kinds of purchasers and the pre-emption right enforcement

	1983 - 85						1986 - 88					
	Observations			Surfaces			Observations			Surfaces		
	No	Pre-empt.	% (1)	Ha	Pre-empt.	% (2)	No	Pre-empt.	% (1)	Ha	Pre-empt.	% (2)
- PLAIN AREAS -												
- Farmers	952	705	74,1	4.062	2.867	70,6	835	541	64,8	3.957	2.345	59,3
on the purchased unit	485	440	90,7	2.260	2.031	89,9	339	319	94,1	1.769	1.659	93,8
on other units	467	265	56,7	1.802	837	46,4	496	222	44,8	2.188	686	31,4
- Sharecroppers	157	151	96,2	931	896	96,2	48	45	93,8	309	294	95,2
- Cooperatives	11	7	63,6	449	364	81,0	12	6	50,0	306	180	58,8
- Others	16	7	43,8	106	25	23,7	14	4	28,6	63	16	24,9
* ALL	1.136	870	76,6	5.548	4.152	74,8	909	596	65,6	4.635	2.835	61,2
- HILL AREAS -												
- Farmers	67	47	70,1	549	309	56,3	93	57	61,3	1.319	531	40,3
on the purchased unit	35	30	85,7	262	220	83,8	39	33	84,6	497	375	75,3
on other units	32	17	53,1	287	89	31,1	54	24	44,4	821	157	19,1
- Sharecroppers	27	26	96,3	331	324	98,0	7	6	85,7	81	66	82,2
- Cooperatives							1	0		21	0	
- Others							5	1	20,0	53	5	9,4
* ALL	94	73	77,7	880	633	71,9	106	64	60,4	1.473	603	40,9
- ALL -												
- Farmers	1.019	752	73,8	4.611	3.177	68,9	928	598	64,4	5.276	2.877	54,5
on the purchased unit	520	470	90,4	2.522	2.251	89,2	378	352	93,1	2.267	2.034	89,7
on other units	499	282	56,5	2.089	926	44,3	550	246	44,7	3.010	843	28,0
- Sharecroppers	184	177	96,2	1.262	1.220	96,7	55	51	92,7	389	360	92,5
- Cooperatives	11	7	63,6	449	364	81,0	13	6	46,2	327	180	55,1
- Others	16	7	43,8	106	25	23,7	19	5	26,3	116	21	17,9
* ALL	1.230	943	76,7	6.428	4.786	74,4	1.015	660	65,0	6.108	3.438	56,3

(1) Pre-emption transfers on the number of observations
(2) Pre-emption transfers on the total surface

TABLE 4. Purchases with credit support

	1983-85				1986-88			
	No	% (1)	Ha	% (2)	No	% (1)	Ha	% (2)
- PLAIN AREAS -								
- New owner occupiers	79	18,2	723	28,4	58	20,1	600	30,5
- Formerly owner occupiers	60	8,5	789	26,3	48	7,7	546	20,4
* All	139	12,2	1.512	27,3	106	11,7	1.146	24,7
- HILL AREAS -								
- New owner occupiers	25	51,0	428	66,3	18	37,5	442	47,5
- Formerly owner occupiers	7	15,6	85	36,3	6	10,3	83	15,4
* All	32	34,0	513	58,3	24	22,6	526	35,7
ALL								
- New owner occupiers	104	21,5	1.152	36,1	76	22,6	1.042	36,0
- Formerly owner occupiers	67	9,0	874	27,0	54	8,0	630	19,6
* All	171	13,9	2.025	31,5	130	12,8	1.671	27,4

(1) Percentage on the number of transfers for the different kind of purchasers
(2) Percentage on the transferred land for the different kind of purchasers

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TABLE 5.   Land values by types of land use

LAND USES				1983-85				1986-88			
AL	OV	PW	No	Ha	%	000 Lit/Ha	No	Ha	%	000 Lit/Ha
- P L A I N A R E A S -											
>75 %	<20 %	<10 %	372	1.692	30,5	20.205	364	1.660	35,8	24.033
>60 %	>20 %	<10 %	132	866	15,6	21.322	61	434	9,4	25.874
35%<>60%	35%<>60%	<10 %	284	1.520	27,4	24.389	134	807	17,4	29.866
>20 %	>60 %	<10 %	170	840	15,1	26.993	157	971	20,9	34.566
<20 %	>75 %	<10 %	178	630	11,4	28.154	193	763	16,5	39.198
All			1.136	5.548	100,0	23.456	909	4.635	100,0	29.925
- H I L L A R E A S -											
>20 %	>60 %	<10 %	14	124	14,1	16.286	22	166	11,3	24.965
35%<>60%	35%<>60%	<10 %	16	163	18,6	13.164	13	183	12,4	14.882
>60 %	>20 %	>20 %	51	396	44,9	9.596	33	336	22,8	8.194
35%<>60%	<10 %	35%<>60%	9	114	12,9	5.933	19	360	24,4	6.896
>20 %	<10 %	>60 %	4	84	9,5	2.091	19	428	29,1	3.620
All			94	880	100,0	10.012	106	1.473	100,0	9.275

AL = Arable land
OV = Orchards & vineyards
PW = Pastures & woods

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Figure 1 – LAND MOBILITY, 1983 – 88
Average data by altimetric zones

Plain areas

Hill areas
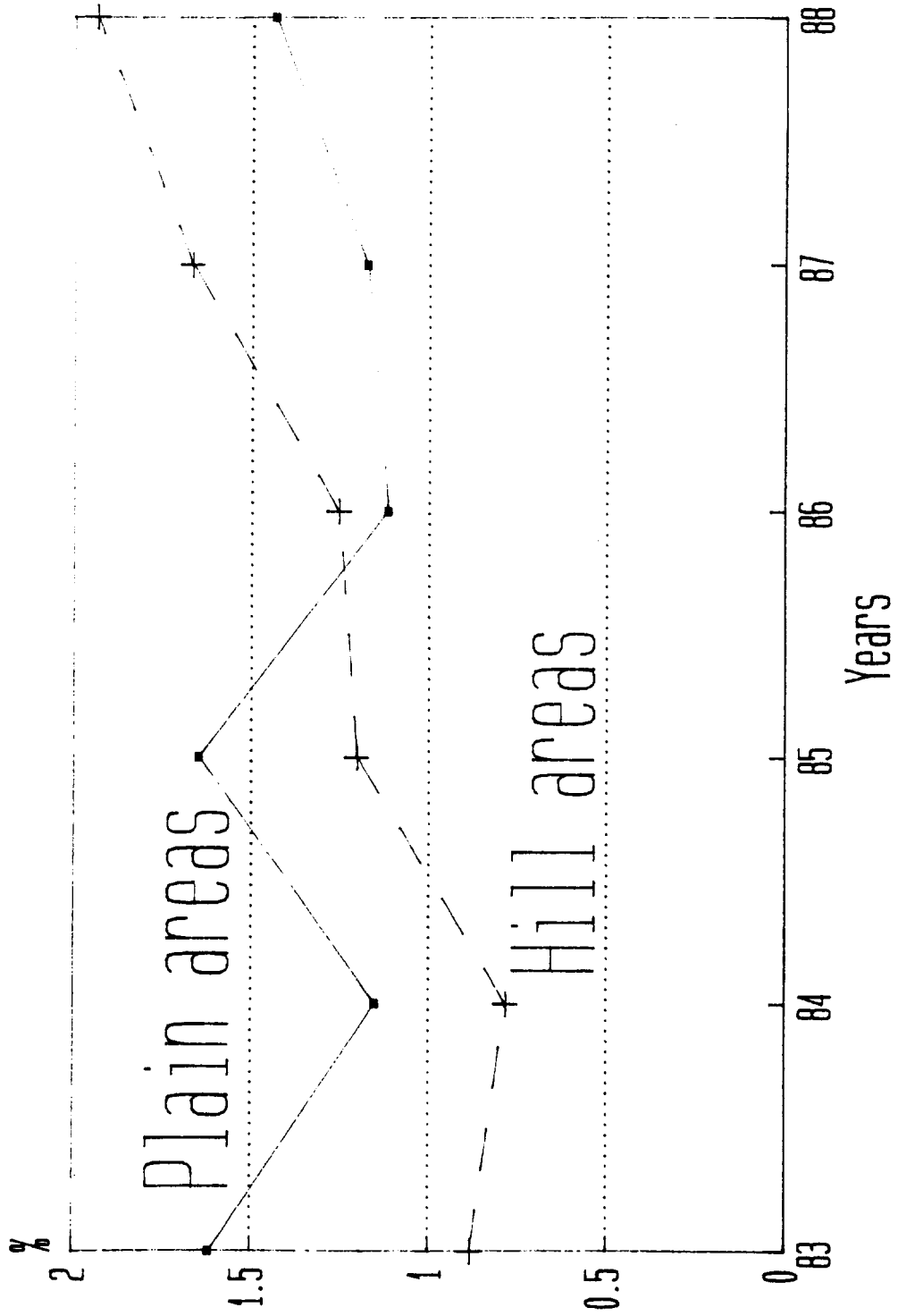
Years

Figure 2 - PURCHASERS UNDER 40 YEARS OLD

14
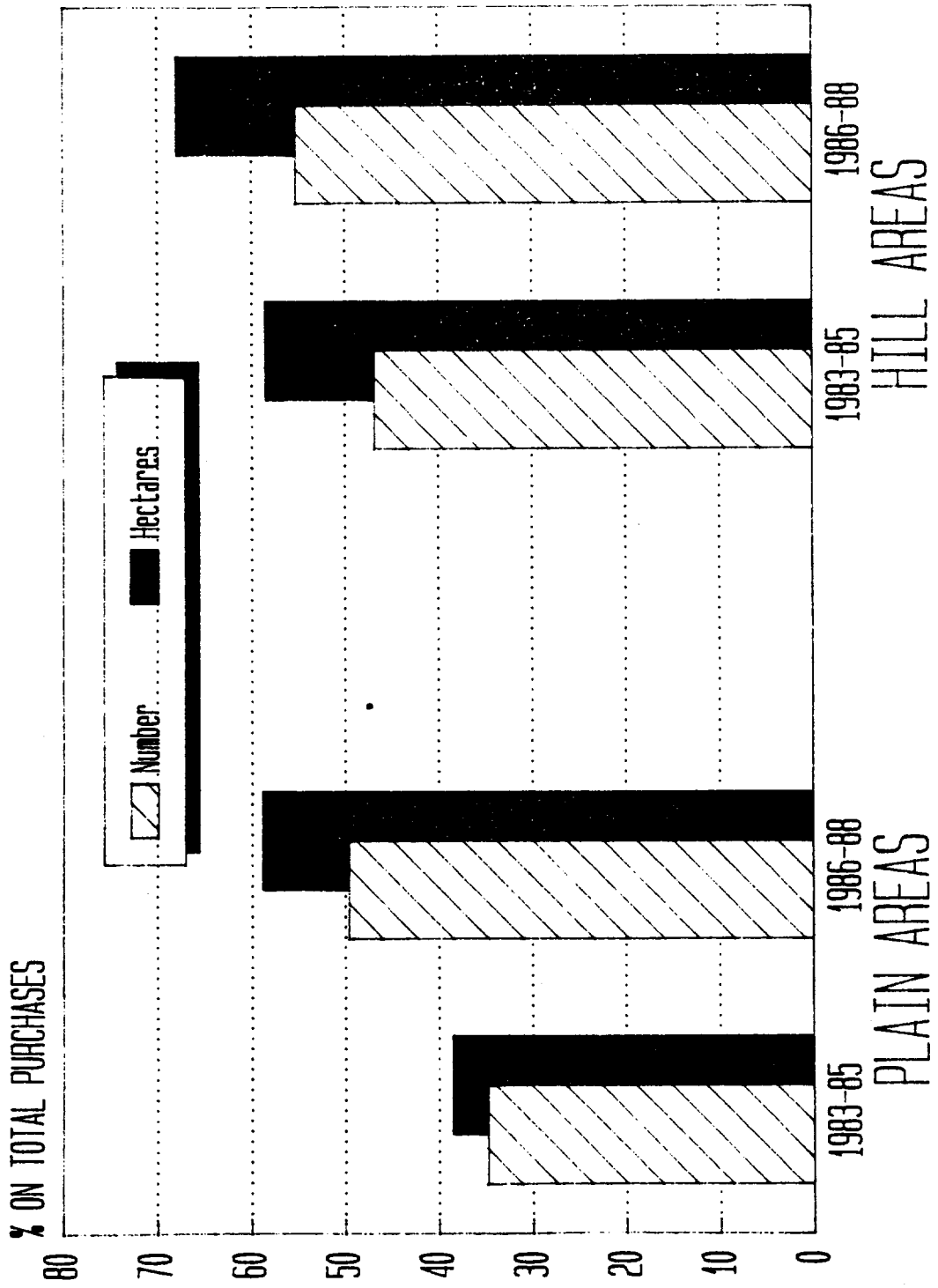
Figure 3 - PRE-EMPTION RIGHT ENFORCEMENT

% ON TOTAL PURCHASES

Legend: Number, Hectares

100
80
60
40
20
0

PLAIN AREAS
1983-85   1986-88

HILL AREAS
1983-85   1986-88

Figure 4 - PURCHASES WITH CREDIT SUPPORT

% ON TOTAL PURCHASES

Legend:
- Number
- Hectares

PLAIN AREAS: 1983-85, 1986-88
HILL AREAS: 1983-85, 1986-88

Y-axis: 0, 10, 20, 30, 40, 50, 60, 70

16
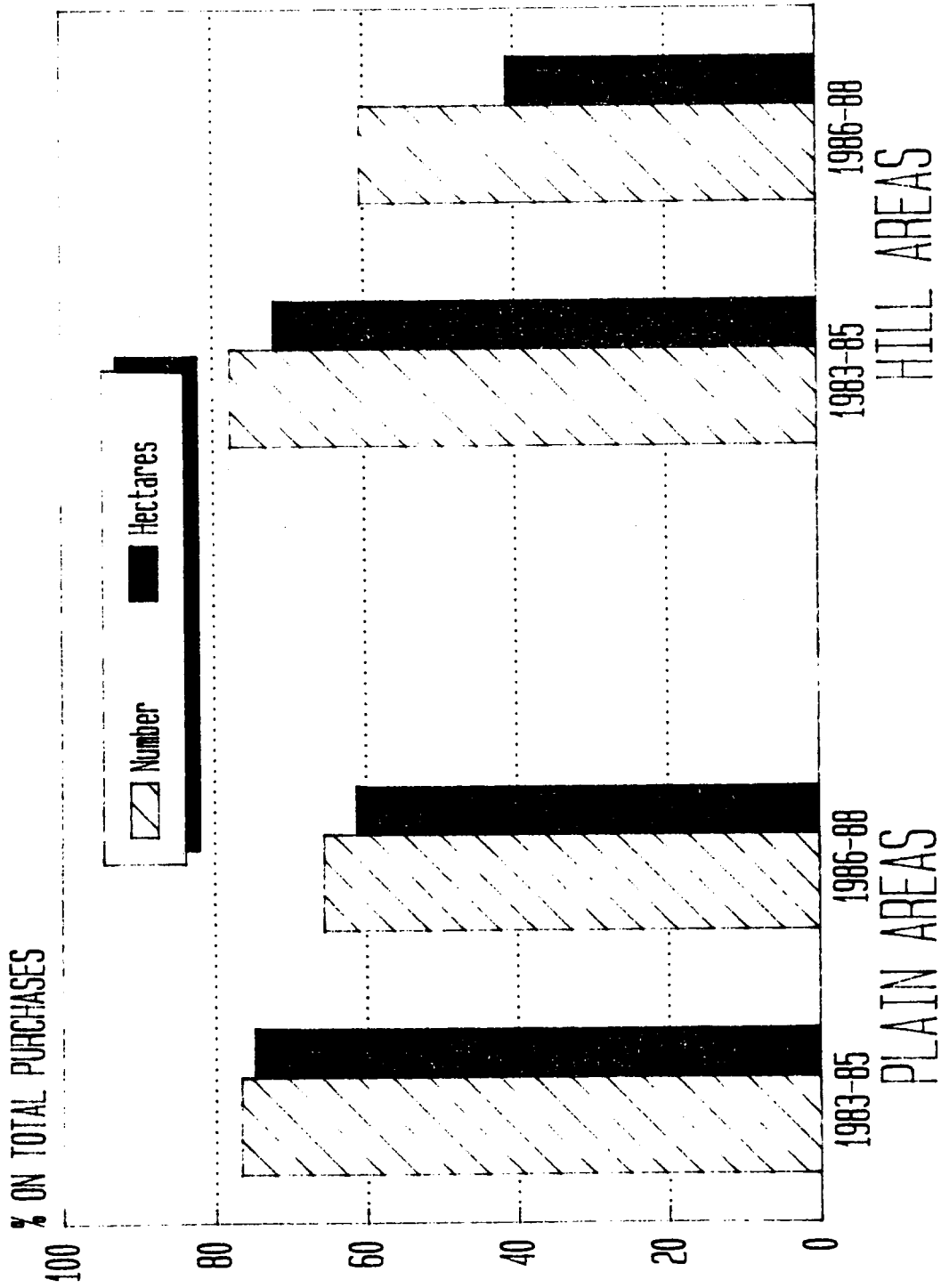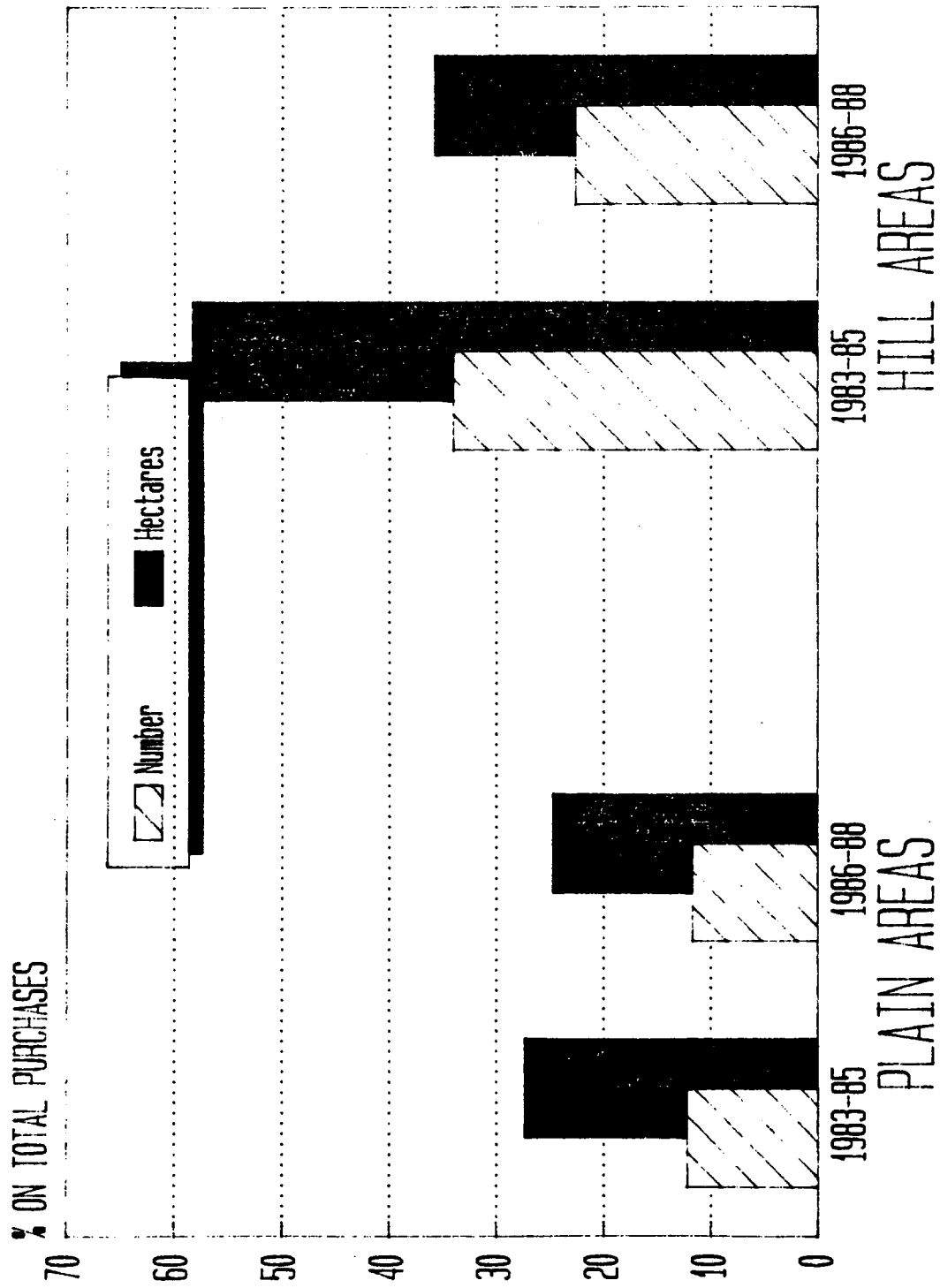
Figure 5 - LAND PRICES, 1983 - 88
Average data by altimetric zones
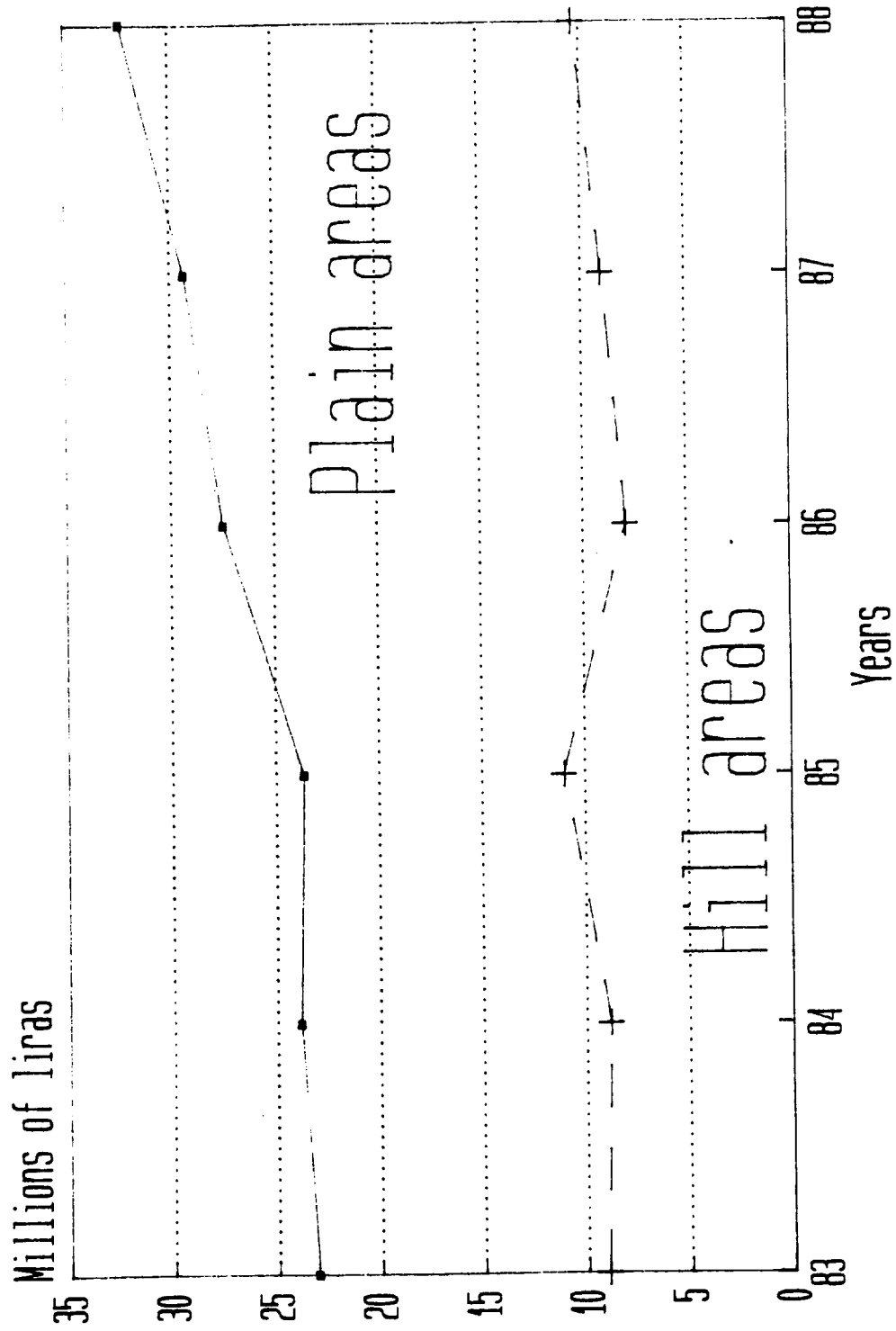
FIGURE 6 - VALUES vs. LAND USES
Communal average data, 1983-85 / 1986-88

Millions of liras

1986-88

1983-85

% orchards & vineyards
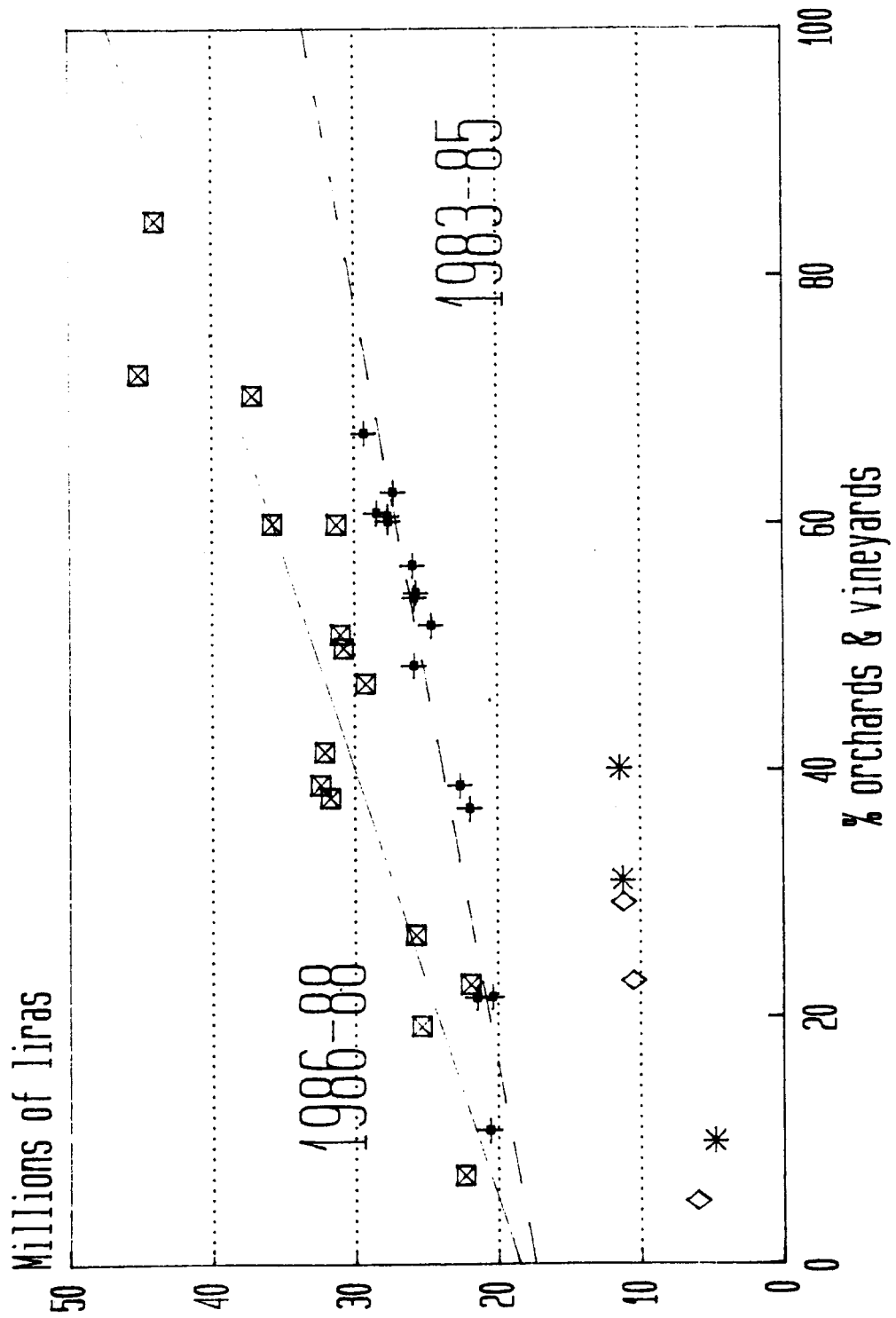
F. Mari *   L. Venzi **

FARM LAND MOBILITY AND VALUES

IN LAZIO

A) INTRODUCTION

A regional analysis of farm land mobility and values for
Lazio, to our knowledge, has never been performed so far at
regional, provincial and zone area levels.

Several reasons may explain the lack of information relating
to these issues, if we compare the Lazio situation with that of
other regions, and they relate to different   opportunities
existing in accademic and administrative structures.

Generally speaking and above existing opportunities, it is
not easy to analyse land market as such, because as it is well
known its basic features lack trasparency, are scattered and come
from discontinuous   activity,   are biased   in   reporting
transactions, relate to high heterogeneity in the nature of land,

----

suffer interactions with other destinations for land and finally bear macro-economic pressures as refuge goods.

This paper presents preliminary results acquired from a wide search of data at different locations in Lazio and will attempt to confront these results in order to evaluate the reliability of sources as suitable indicators for land values.

The sets of data used here for land mobility came from the central office of Cadastral Administration and are neither official, nor issued for that purpose, although they were useful as good insight of the phenomenon.

As for land market values, three sets of data have been used and, on a very small scale, also confronted. They refer to the Lazio section of the national survey of land values carried out by INEA since 1952, the VAM values (Average Agricultural Values) issued by Regional authorities for condemnation purposes since 1972 and data from local (Provincial) Registrary Office derived from direct transactions. The paper will follow the pattern previously mentioned and tentative concluding remarks will close it.

B) AN ATTEMPT TO MEASURE LAND MOBILITY

Until recently the Administration of the Cadastral Services published an Annual Report of its operations. Although the data contained in the report should not be used as such for this purpose, they could be processed to make quantitative estimates of land mobility, a subject not easy to deal with so far.

On the other hand, the work of the Cadastral Land Registry,

remains a useful point of reference. Data for Lazio obtainable from this source pertaining to final, real, transfers in terms of number of plots, or surfaces, in the documentation of Cadastre are limited, incomplete, and full of gaps.

As regards the time series of data referring to the requests for transfer of title, however, the situation is fairly satisfactory. In fact, they are certainly reliable, and, contrary to the number of plots transferred, are independent from the actual work of transfer and thus reflect the effective demand for administrative action, relating to personal exchanges which have taken place over the years.

One element of uncertainty, however, is encountered in trying to convert the requests for transfer into the number of plots concerned and total surfaces. This is because of lack of regional statistics. Thus, the only solution appeared to be to assume that the national average of 2.5 plots per request was valid also for Lazio.

Bearing in mind all the limitations described above, we can now proceed to discuss and process the data contained in table 1.

The most interesting series appear to be those relating to requests for transfer of title. In fact, these differ when considered at Provincial and at Regional Level.

At Regional Level, there is a high degre of stability in figures untill 1984; there follows a sharp drop between 1984 and 1985 and a slight increase in 1986, ending with an even greater fall in 1987.

Provincial data, instead, show a clear difference between Roma

Tab.1: Land mobility indicated by data from the Cadastral Registrary of Lazio

	1981	1982*	1983	1984	1985	1986	1987
Frosinone							
No. of plots (P)	1149050		1023591	1040900	1021060	1021060	1021060
Requests for transfer (V)	10125		10140	10374	8407	7285	8625
Mobility index (I)	2,202906		2,476575	2,491593	2,058400	1,783685	2,111775
Latina							
No. of plots (P)	409092		421388	439278	440029	440029	440029
Requests for transfer (V)	8379		7866	7839	5879	4658	5210
Mobility index (I)	5,120486		4,666720	4,461297	3,340120	2,646416	2,960032
Rieti							
No. of plots (P)	544279		610174	614524	615569	620759	623533
Requests for transfer (V)	4096		4932	5352	3920	3681	3936
Mobility index (I)	1,881388		2,020735	2,177294	1,592022	1,482459	1,578104
Roma							
No. of plots (P)	1460849		1461916	1462031	1464120	1464120	1464120
Requests for transfer (V)	17263		18183	17450	17610	21527	9975
Mobility index (I)	2,954275		3,109446	2,983856	3,006925	3,675757	1,703241
Viterbo							
No. of plots (P)	473366		479619	482608	482608	486640	486640
Requests for transfer (V)	7096		6594	6737	6737	5704	6407
Mobility index (I)	3,747628		3,437103	3,489892	3,489892	2,930297	3,291447
Totale LAZIO							
No. of plots (P)	4036636		3996688	4039341	4023386	4032608	4035382
Requests for transfer (V)	46939		47715	47752	42553	42855	34153
Mobility index (I)	2,907061		2,984658	2,955432	2,644103	2,656779	2,115846

* 1982 not yet available

and the other Provinces. Without entering into the details about trends, which can be clearly seen from figure 1 it is important to notice that what happened in the Province of Roma was clearly attributable to "land movements" towards non-agricultural uses (building and industry) and that the quantity and quality of these movements are such as to stand in marked contrast to those in the rest of the Region, and as such to condition the overall trend. Moreover, for the more industrialised areas of Frosinone and Latina the drop in requests in 1984 coincides with the depression under way at that time and with the relevant fall in incomes.

As regards an "index of mobility", this has been constructed simply by multiplying by 2.5 the number of requests for transfer and expressing the result as a percentage of the total number of plots registered at the Cadastral Registry i.e..

$$I = \frac{C \quad V}{P} \; 100$$

where I = mobility index;

C = coefficient for conversion of request to no. of plots;

V = no. requests for transfer;

P = existing stock of plots registered.

The index thus expresses the percentage of cadastral plots which were involved in subjective transfers (sales) during the year - (assuming, of course, that the conversion coefficient is valid).

Its numerical value has no particular significance for land
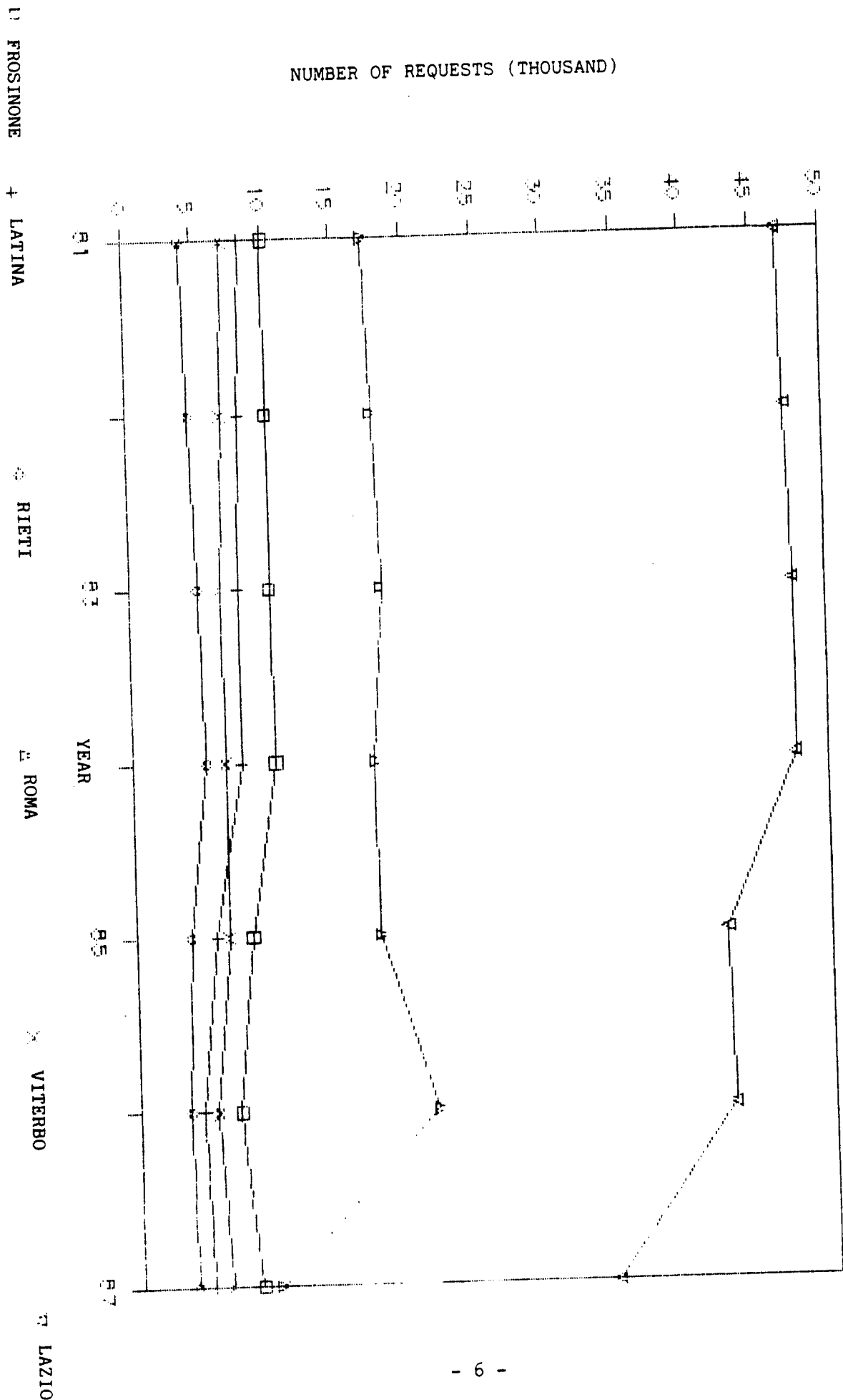
- 5 -

NUMBER OF REQUESTS (THOUSAND)

Fig. 1: REQUESTS FOR TRANSFER OF TITLE:
COMPARISON BETWEEN REGION AND PROVINCES

□ FROSINONE   + LATINA   ◇ RIETI   △ ROMA   ✕ VITERBO   ▽ LAZIO

YEAR

mobility in the strict sense, since requests for transfer of
title are made for various changes of ownership (sales,
inheritance, gift, transfer by right of use etc.) and change of
specified land use (agricultural, or non agricultural). Moreover,
no reference can be made to the average size of plot and in fact
plots with different sizes may be considered to indicate
different levels of land mobility. In this respect, for example,
the significance of transfers by sale of many small plots for
building sites must be taken in due account.

Certain indications can be deduced from the analysis of trend,
or, rather, from the relevant positions in the overal picture of
graphs relating to these trends. They involve the average size of
plots, and are therefore directly correlated with the structure
of farms, or with the degree of fragmentation of land. It can be
seen that the relatively few requests for transfer, originating
from the Province of Viterbo and Lazio in total, resulted in a
rather high percentage index of change, whereas the high number
of requests in the Province of Rome did not represent a large
percentage change whith respect to the number of existing plots.
fig. 2)

Since there are not great differences in size between the
different Provinces which would create numerous and large plots
(or, instead, few and small plots) and since it seems unlikely
that there are strong differences at provincial level in the
coefficient, it seems reasonable to assume that the phenomenon
described above should be interpreted with respect to a
differentiated degree of fragmentation in the different

Fig. 2: INDICES OF MOBILITY:
COMPARISON BETWEEN REGION AND PROVINCES

□ FROSINONE   + LATINA   ◇ RIETI   △ ROMA   × VITERBO   ▽ LAZIO

- 8 -
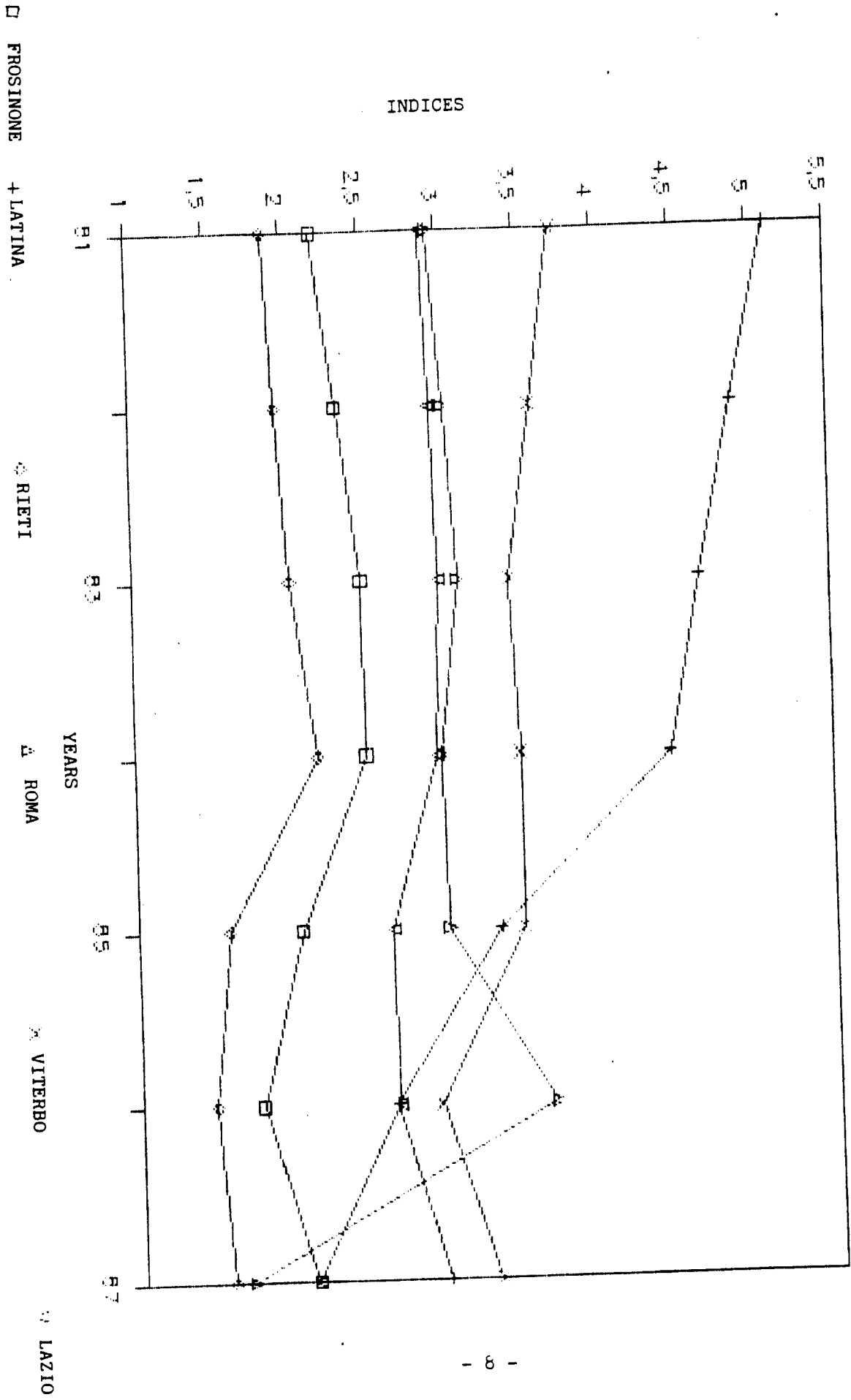
Provinces.

C) THE EVOLUTION OF LAND VALUES IN LAZIO RESULTING FROM OFFICIAL

   DATA

As for land mobility, the major problem in studying the land values is that of obtaining information, at least so far for us.

In this case, however, the problem is not so much of quantity but of quality of data. In fact, there are numerous sources of information, but the data are not very reliable since there is a widespread tendency to declare less than actual values in land transactions.

It is not possible here to enter into details to explain why this is so, nor to examine the effects of measures adopted to overcome the problem. We will limit ourselves to comparing time series of land values available from different official sources in order to demonstrate the differences and to analyse the degree of reliability.

The sources considered are INEA (1) (National Institute for Agricultural Economics), the Registrary Office (2) and the Lazio Tax Office (3) (the last two are cited in connection with the pubblication of VAM). The land values examined here refer only to different types and qualities of land in the Province of Viterbo, as an example.

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(1) Land values worked out by Regional Observatories of INEA derived from a sample of sales articulated by zone, by type of production and by farm type.   (note follows at page 10)

The time series are shown in fig. 3. The first of these compares VAM (average agricultural value) with land values estimated through an INEA Survey. They refer to both dry and irrigated arable land. The first impression from the figure is that of the "strange" behaviour of average agricultural values. Apart from being extremely low, they are also "flat" and indicate an excessively stable land market, unresponsive to demand and supply. Moreover, from the constant increase ratios existing for bothh dry and irrigated land value series, it seems that they have been constructed with reference to something like an annual rate of inflation, rather than with reference to the market (fig. 4). In any case if compared with INEA values, the VAM appear not to be suitable indicators of market values even as an indication of trend.

As regards INEA values, instead, from examination of the figures it can only be said that these are considerably higher than VAM. But the difficulties incurred in constructing these series, particularly that for dry arable land, must be mentioned.

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(continuation of note at page 9)

(2) Registrary Office values of sale declared spontaneously to notaries and subject to test by the Registrary Office on standard values.

(3) VAM - Average Agricultural Values - determined by a special Commission, or by the UTE (Technical Fiscal Office) to establish values for expropriation according to the quality of crops and to homogeneous zones.
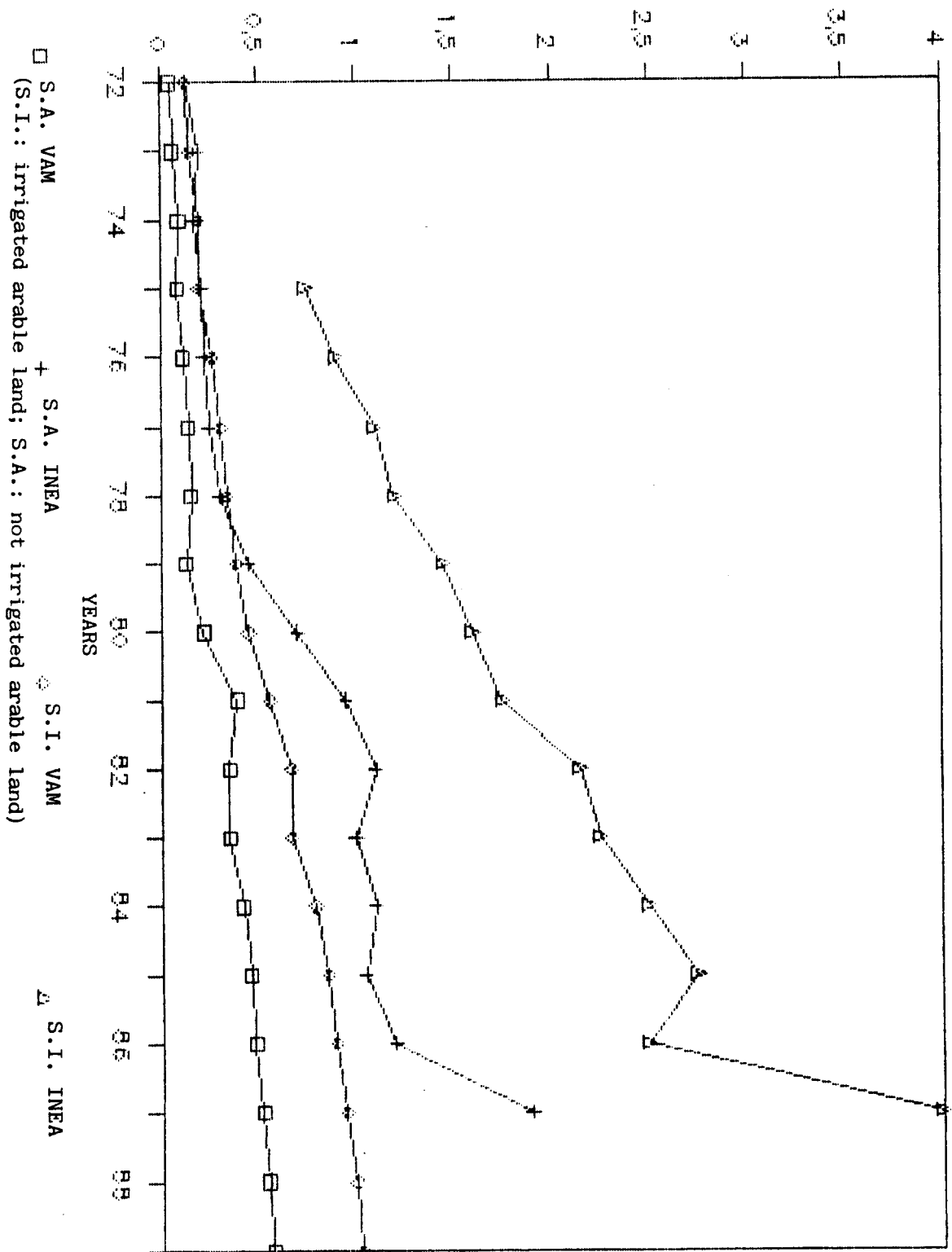
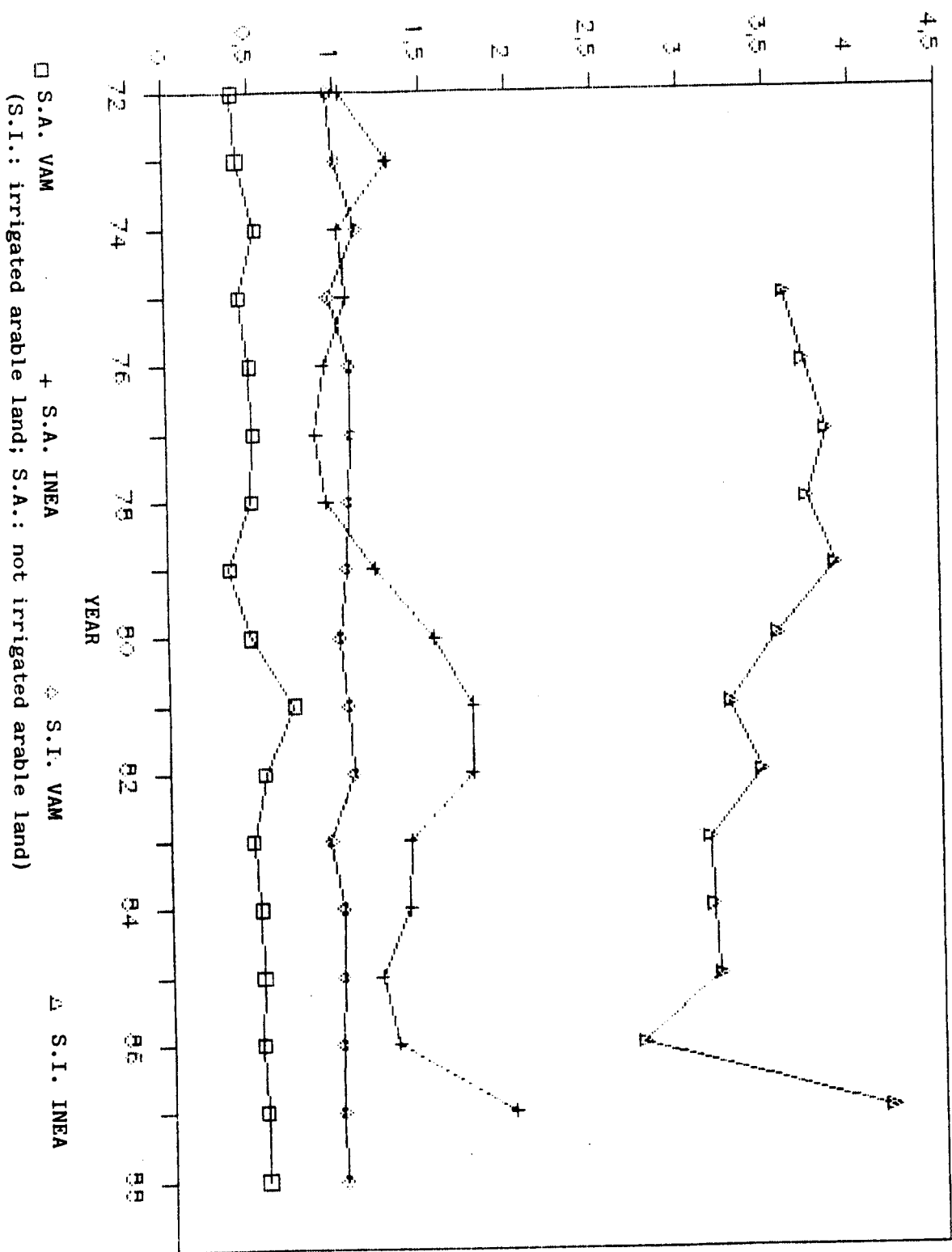THOUSAND LIRE PER SQUARE METRE

Fig. 3: CURRENT FARM VALUES IN LAZIO

YEARS

□ S.A. VAM   + S.A. INEA   ◇ S.I. VAM   △ S.I. INEA

(S.I.: irrigated arable land; S.A.: not irrigated arable land)

THOUSAND LIRE PER SQUARE METRE

Fig. 4: CONSTANT FARM VALUES IN LAZIO

□ S.A. VAM   + S.A. INEA   ◇ S.I. VAM   △ S.I. INEA
(S.I.: irrigated arable land; S.A.: not irrigated arable land)

YEAR

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In the surveys undertaken by INEA, within the same Province, there are frequent changes in "zone" and in "farm types" reference. Even if that is an advantage as regards contact with real situation in agriculture, it means that the time series is not homogenous and comparisons can be made with certain difficulty.

The second figure shows land values relative to a specific and particular agricultural activity i.e. to values of filibert nut groves in the village of Capranica (Province of Viterbo) with VAM data, those from the Registrary Office and from INEA (fig. 5).

The VAM time serie confirms the observations made previously with reference to dry and irrigate arable land. Thus, no more will be said on this subject.

Much more information, however, can be obtained from the Registrary Office and for INEA. Altough these series differ one from another, they show al least similar trends (fig. 6). This implies that they reflect, even if approximately, market moves. In fact, it seems reasonable to assume that values available from the Registrary Office, whilst not corresponding because of tax underestimation with real sales values, are effectively correlated with them.

It also seems feasible that INEA values are a good approximation of the truth, if only because collected on the basis of direct knowledge of the actual situation. The fact remains that they cannot be used, except as indicators, because they take no account of the consideral variation between farm values within the same "homogeneous" area.
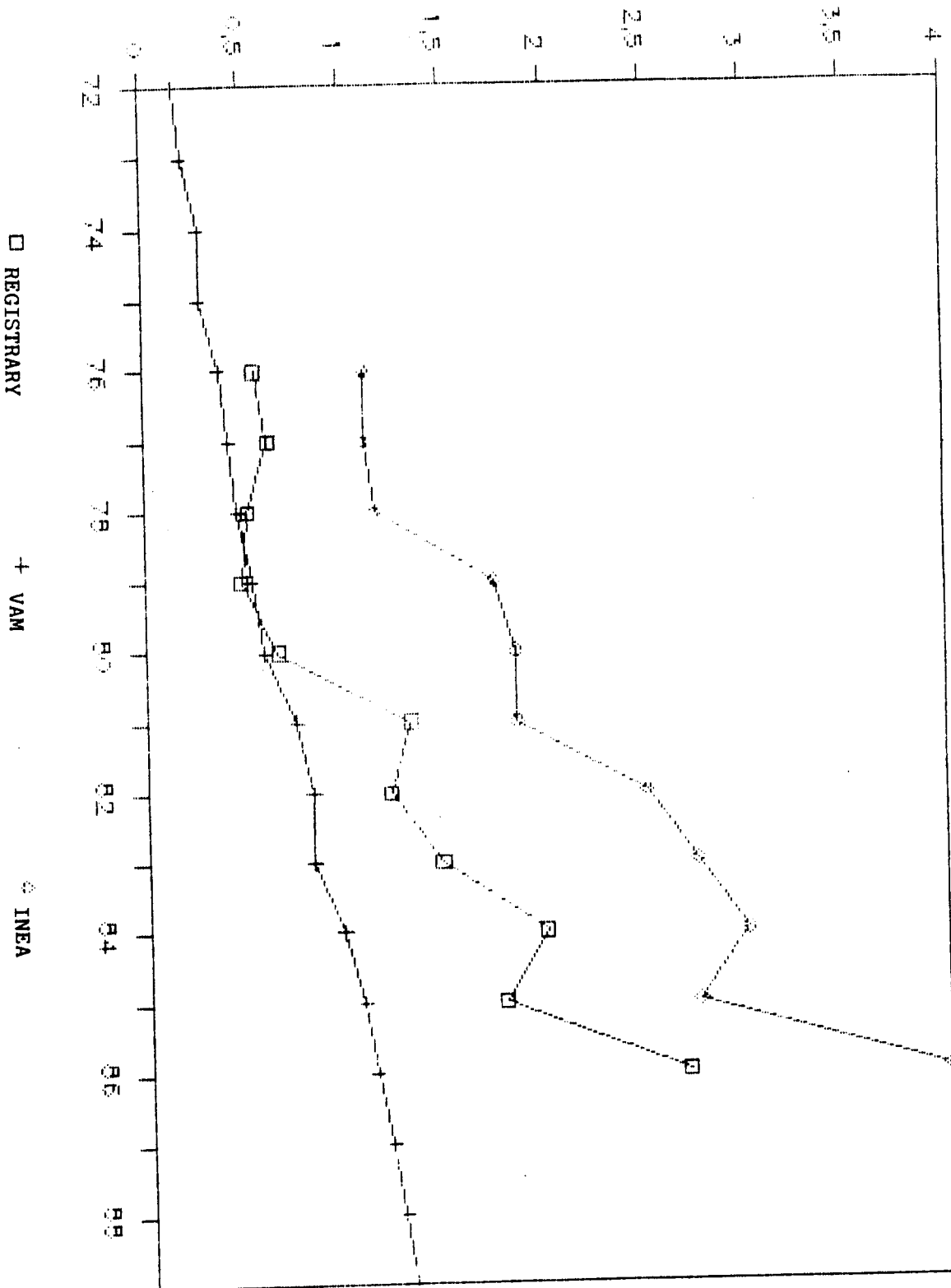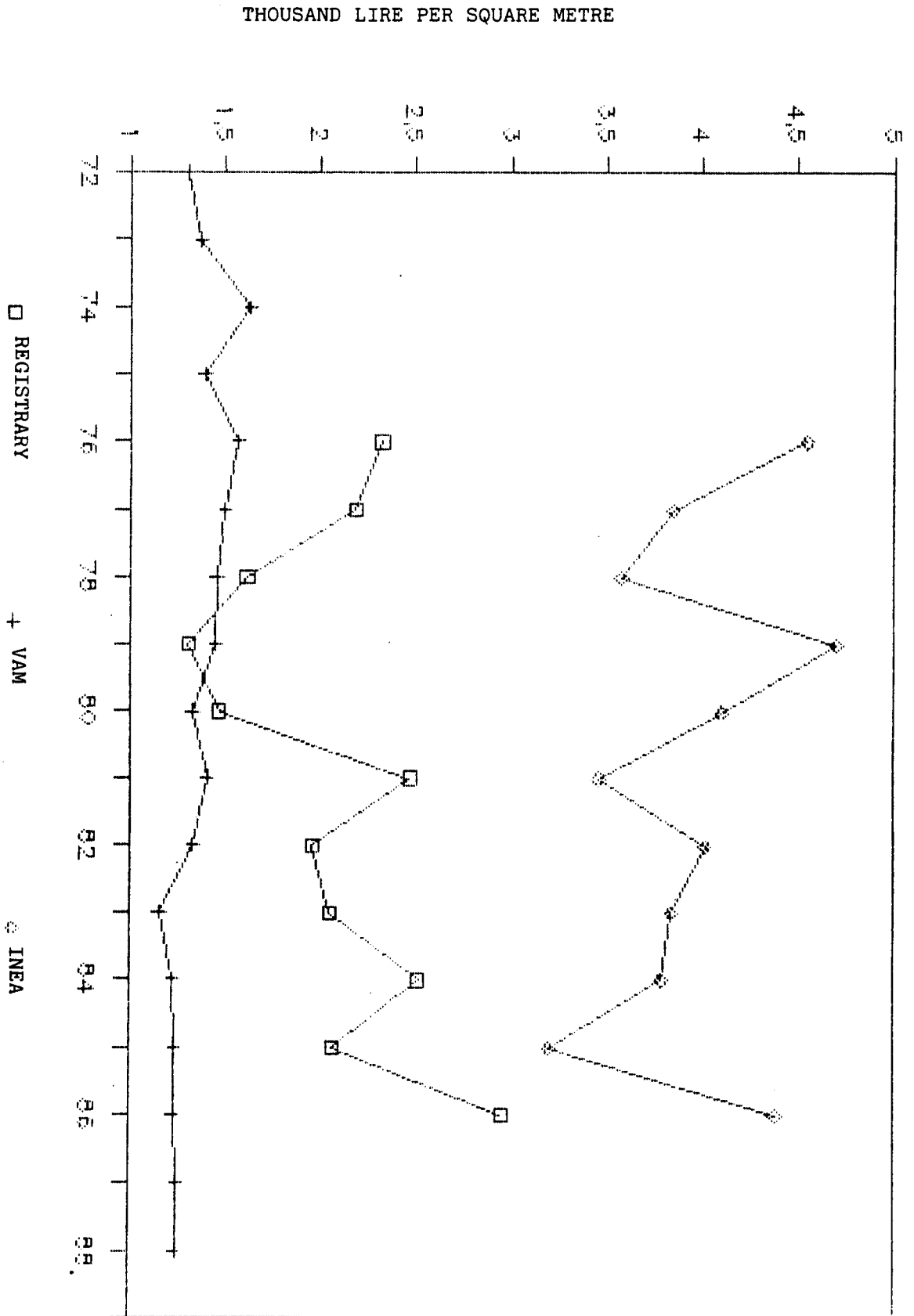
THOUSAND LIRE PER SQUARE METRE

Fig. 5: LAND VALUES FOR FILIBERT NUTS GROVES (CURRENT VALUES)

□ REGISTRARY   + VAM   ◦ INEA

- 14 -

THOUSAND LIRE PER SQUARE METRE

Fig. 6: LAND VALUES FOR FILIBERT NUTS GROVES (CONSTANT VALUES, base 1988)

□ REGISTRARY   + VAM   ◇ INEA

D) AN ATTEMPT TO EXPLAIN MARKET SALES VALUES

Knowledge of farm values is an essential element in the process of appraisal. Limited market transparency and strong differences in values are the condition in which appraisers are called to operate in the land market.

Cross sectional differences in prices are the result of marked differences in the natural and man-made characteristics of farm holdings. The difficulty in obtaining information about land prices derives both from the limited market and from the traditional reticence of the operators. All these circumstances mean that the farm real estate appraiser must often rely on his ingenuity and capacity to summarise, in order to solve the questions confronting him. One good thing is that despite differences, there are some basic trends and some common patterns of behaviour. By applying statistical methods, particularly regression analysis, a model explaining the relationship between the dependent variable (i.e. value) and independent variables can be constructed.

The usual form

$$V = f(X_1, X_2, \ldots, X_k)$$

seeks to explain land values correlating them with different intrinsic characteristics of the farm so far. This type of analysis has been applied to Capranica area. The relevant information comes from the Registrary Office. The model used was as follows:

$$V = f(SUP, DIS, RD, RA, ETA)$$

where: V = land value;

SUP = area;

DIS = distance from residential area;

RD = land rent (tax assessment);

RA = farm income (tax assessment);

ETA = age of filibert grove.

The results obtained from regression analysis showed that not all variables considered concurred to determine value, according to the following estimates based on 64 observations:

$$V = - 4780433 + 670.64 \text{ SUP} + 793.52 \text{ DIS} + 2263.58 \text{ RD} +$$

$$(2.17) \qquad (1.95) \qquad (0.27)$$

$$+ 103074.70 \text{ RA} + 27436.04 \text{ ETA}$$

$$(1.16) \qquad (197.38)$$

R Sq = 0.53   Degrees of freedom = 58

Closer scrutiny of observations and putting together another set of them, relating to transactions of small land tracts not mentioning filibert groves, but where it was ascertained that those were on site, allowed to improve the statistical results, by also siplifying the model as:

$$V = f(\text{SUP}, \text{DIS}, \text{ETA})$$

The estimates yielded the following results:

$$V = 6,390,486.00 + 1,953.00 \text{ SUP} - 113.00 \text{ DIS} + 7,632.00 \text{ ETA}$$

$$(38.0) \qquad (.41) \qquad (2.2)$$

R Sq = 0.95   Degrees of freedom = 84

As value determinants these results were quite predictable, though distance disappointed expectations in terms of reliability, but for the sign of the relationship.

E) CONCLUDING REMARKS

The data collected and tentatively analysed so far have given a picture of land mobility and values for Lazio which has still many aspects to be further investigated.

As a general feature it is possible to perceive that Lazio land market presents a dichotomous behaviour, determined by the presence of a single large entity as Rome, which works along different policy orientations (urban, industrial etc.) and the rest of the other provinces which, instead, show a more agricultural oriented connotation.This explains the more dynamic trend for Rome land mobility, which also affected, by its size, the total Lazio mobility figure and indexes.

Unfortunately, the only available element in oder to measure mobily was the Cadastral survey relating to single surface plots, a some-how remote element to give a sound picture of farm dynamics. Even so, the rural provinces showed an homoneons, steady behaviour, in terms of request of transfer, very likely even a reduction in the share of transfers due to market deals, since the figure shown relate also to hereaitary and condemnation

cases.

The second issue considered in the paper dealt with land values in a short period, over 15 years, a period not sufficient to catch significant endogenous features of land use structure, particularly those of land use structure as forest and tree crops. Exogenous elements and those of more economic, than technical-institutional, nature have, however, influenced farm value series when they referred to market transactions. Other authors in this seminar have discussed the overall development features of the Italian land market; certainly they worked as well in Lazio too, and we fully agree with that interpretation.

Data of land values coming from INEA gave a clear indication of the appreciation of the market for best land (arable irrigated, or not) in current prices, but the extent of it did not show too relevant when considered in terms of constant prices. Other qualities of land did not fare so well and they little increased in current prices, but actually their appreciation rate was below current inflation rate.

The comparison between VAM and INEA values showed clearly the "difficult" origin of the former and their inadequacy to monitor any market peculiarity in behaviour. Moreover, being VAM data a base for condemnation values, to be increased according to the agricultural qualification of affected parties, they were perhaps left by design at the lowest levels, somehow to implement a wealth redistribution.

In the example drown at lowest geographical level, i.e. the village of Capranica, a full scale comparison exercise has been

carried out, including this time also data collected from the Registry Office for transactions, checked at local level by us for technical and structural features. Again, market data from sales and INEA time series for that particular environment showed high degree of correlation, still allowing for obvious differences due to independent source, but VAM values clearly appeared out of context.

Finally a comment on the results from the explicative model for price determinants relating to filibert nuts groves. It was a preliminary investigation, somehow promising, but not yet satisfactory, as more structures have to be tested and the model has also to be experienced on other crops and different environments.

Summing up, sources of land values and land mobility in Lazio are still scarce and often biased by institutional features. Further investigation is pending on land values, but at regional level it has to be taken in great consideration the effect of a large city like Rome, not only in terms of urban land use, but also as source of flow of investments (purchases) into land for status, leisure and also for agricultural purposes.

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AN ANALYSIS OF THE LAND MARKET IN THE VENETO REGION:
FACTORS AFFECTING AGRICULTURAL LAND PRICES (1)

by

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1. Purpose and Contents

The purpose of this paper is to analyse and identify
the different factors which have influenced the value of
agricultural land in the Veneto Region over the past thirty
years. In particular, a distinction is made between factors
related to long-term as opposed to short-term trends. A
survey is then carried out to identify the influence of
different land features on prices, on the basis of a sample
of land transactions undertaken over the years 1986-88.
    The conclusions of the paper concern the nature of the
land market and hypotheses are put forward about its future
development.

2. Data Sources and Methodologies

The analysis of land prices (and the factors that
influence them) was undertaken on the basis of historic
series from the '60s to the '80s. Given the extremely
complex nature of the land market -which is at times
controversial if not contradictory- a multiplicity of
variables were considered, some of which were later
discarded during the analysis.
    The sources of land prices (taken as dependent
variable) were worked out from the INEA annual reports
(Annuario dell'Agricoltura-Agricultural Year Book). The
following farm typologies were considered in particular:
central plain (Treviso, Padova, Vicenza and Verona
provinces), peripheral plain (provinces of Rovigo and
eastern Venice), hills with quality vineyards and mountain
areas (Belluno, Vicenza and Verona) (see map).

Veneto Region

Legend:
- ☐ Mountain areas
- ■ Quality vineyard hill
- ▨ Central plains
- ▧ Peripheral plains

AUSTRIA

Friuli Venezia Giulia

Trentino Alto Adige

BELLUNO

TREVISO

VICENZA

PADOVA

VENEZIA

VERONA

Lombardia

ROVIGO

Emilia Romagna
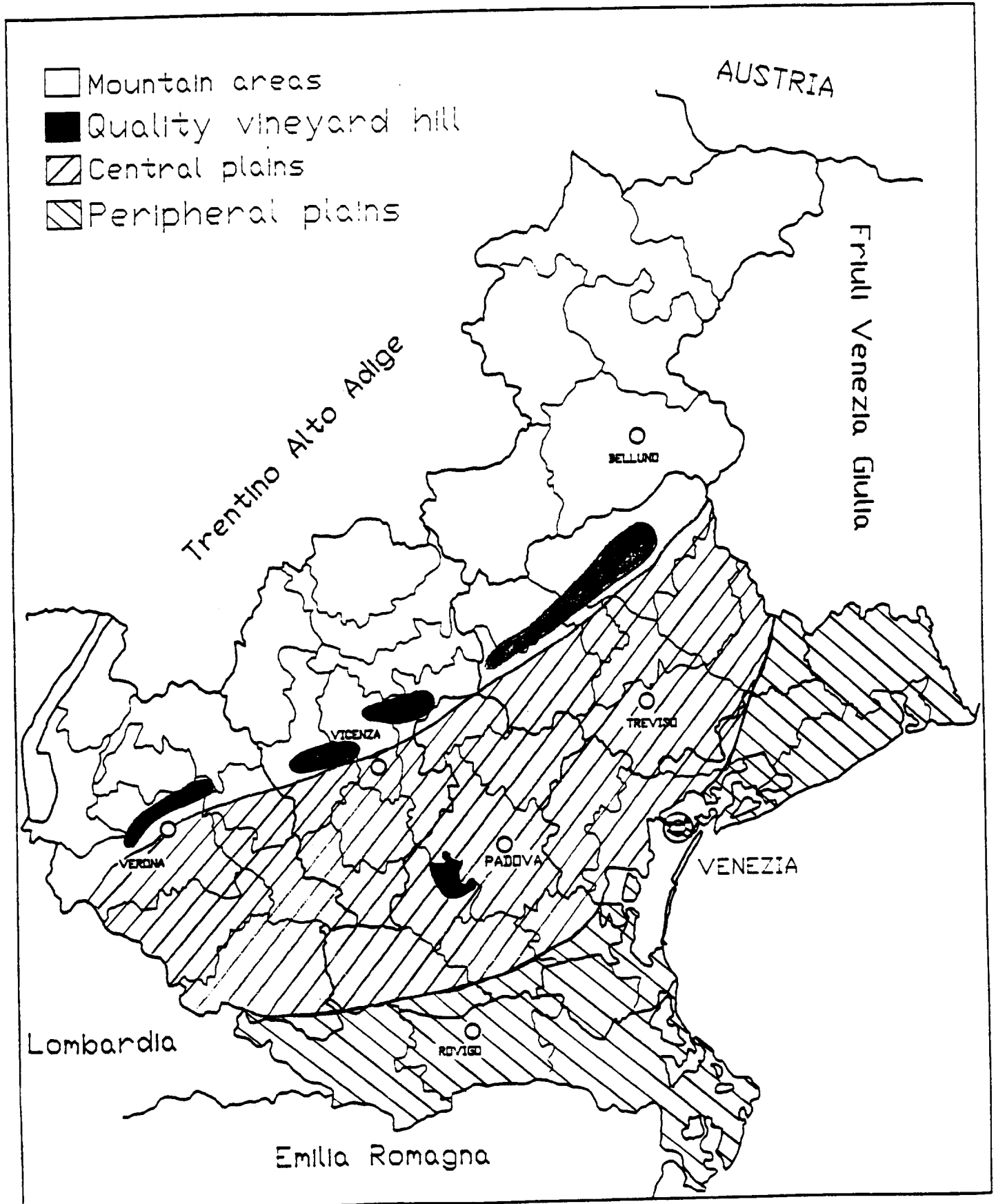
A weight was attributed to each of these typologies in order to obtain an average regional price (2).

The other variables considered were:

- **Gross Internal Product per capita** (GIPpc), from ISTAT sources, a variable related to the flow of regional wealth and hence of purchasing power;

- **Agricultural Added Value per hectare** (AAVha), based on ISTAT sources, a variable related to land productivity and revenues;

- **Agricultural Land per farm worker** (ALfw) and **Added Value per farm worker** (AVfw), worked out from ISTAT sources, variables related to labour productivity and revenues, as well as technical progress.

The following variables were also considered in order to provide a more complete picture of long-term trends:

- the **Prices of Agricultural Products** that are particularly important in the Veneto region (maize, quality wine and milk), again based on ISTAT sources;

- **Financing for the Creation of Small Family Farms**, based on ISTAT sources;

- **Prices of Urban Housing** per square metre, worked out from "Consulente Immobiliare";

- **Average Values of Stocks and Shares**, from data provided by "Bollettino della Banca d'Italia";

- **Agricultural and Urban Land per capita**, from ISTAT sources.

The Analysis of the factors which may influence land values on the short term was completed by considering the historic series of the following variables:

- **Annual Percentage Variations in Land Prices** (current values);

- the **Inflation Rate** (average wholesale and retail prices) and related annual variations;

- **Bank of Italy Discount Rate**;

- **Average Revenues of Government Bonds**;

- **Average Revenues of Shares**.

The distinction between long-term and short-term trends is obviously open to criticism. Practically all the variables mentioned above reflect both long-term and short-term aspects which are difficult to separate. It should be pointed out that an attempt was made to distinguish in particular between the basic trend variables (agricultural and non-agricultural income, technical progress, alternative investments, availability of resources, agricultural and land-use policies) and contingent trends depending on short-term variables (largely of a financial character, such as the inflation rate and income from alternative financial investments).

The analysis of the factors that influence land prices was thus shifted from a temporal to a spatial level,

(2) The weights, related to the estimated extension of the various typologies, are as follows: central plain (39%), peripheral plain (24%), vineyard hills (2%), mountain areas (35%).

particularly by attempting to provide an explanation of the different land values for the sub-regional areas on the basis of settlement patterns, economic development, and hence the specific features of the transacted land.

This latter aspect was analysed by means of a sample survey of land transactions carried out over the past three years (1986-88). 75 cases were considered, relating the land price to the following variables:

- land revenue (soil rent);
- farm acreage;
- altitude;
- location (on sloping or flat ground);
- parcelling of fields;
- quality of farm buildings;
- accessibility;
- use of land;
- seller (socio-economic status);
- buyer (socio-economic status and related legal consequences);
- quality of the environment.

Since notable differences were noted between the characteristics of the land market in the large sub-regional areas -central plain and pre-mountain plain, peripheral plain and mountain areas- this last analysis was also carried out according to subregional areas.

The work is concluded providing an overview of the land market in the Veneto region, considering the amount of land sold, the economic and legal context and the subjects involved. On the basis of historic experience over the last thirty years, the sample survey and political and institutional aspects, hypotheses are put forward regarding future trends in the land market.
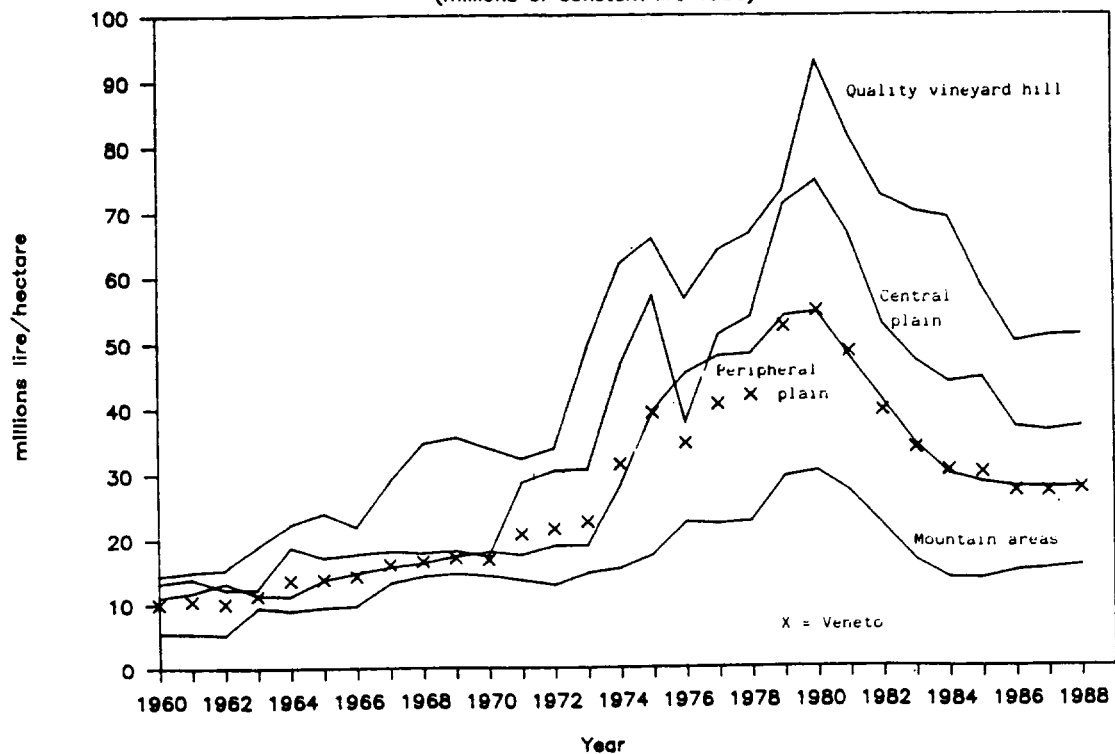
3. Long-term trends in Land Values

Land values in the Veneto Region over the period 1960-1988 show clearly growing trends in current terms (from 1-2 million lire/ha to 40 million lire/ha, as shown by fig.1). In real terms (fig.2), this growth, though evident, came to a halt in 1980, giving way to a subsequent fall in value. Only over the last 2-3 years has there been a positive trend in land prices. In any case, the fact is that land prices have tripled in real terms since the '60s. However, this increase in real terms is less notable in the mountain areas (100%) and in the plains of Rovigo and Venice provinces (150%), with respect to the central Veneto plain and pre-mountain areas where prices have tripled.

Two types of explanation may be given for the variations in land prices as shown by the graphs: the first is economic, related to basic trend variables, while the second is financial, connected with short-term variable. It is far from easy, however, to provide distinct explanations for the two types of factors, given the economic and financial "turbulence" due to inflation in the '70s and

Fig. 1 — Current Land Value

(millions of current lire)

millions lire/hectare

Quality vineyard hill

Central plain

Peripheral plain

Mountain areas

X = Veneto

Year
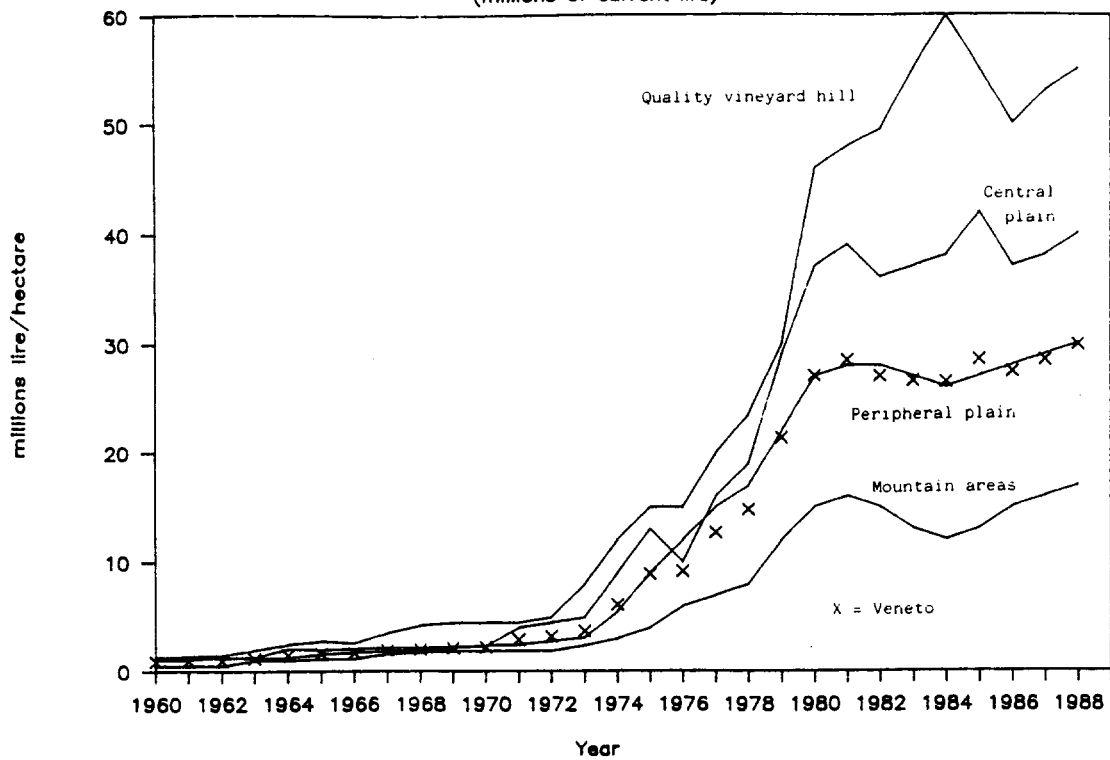
Fig. 2 — Real Land Value

(millions of constant lire 1986)

millions lire/hectare

Quality vineyard hill

Central plain

Peripheral plain

Mountain areas

X = Veneto

Year

5

'80s, as well as the significant growth in industry and services which took place in the entire Veneto, to the extent that the Region appears to be half-way between a state of Integrated Rural Development (as agricultural and rural economists would say) and that of a City-Region (as urbanists and regional planners would say).

3.1 Regional Wealth: Gross Internal Product Per Capita

The relationship between Land Values and Gross Internal Product per capita appears evident when comparing figs. 1-2 and 3, to the extent that one can presume that there is an underlying long-term relationship between the two variables. Real land values and internal gross product per capita were both tripled over the period considered. This clear correlation might be explained by the demand for land on the part of a population spread out over the rural areas, with a rural mentality and strong connections with the land (note the widespread practice of part-time farming) and which has seen significant increases in its income and purchasing power. The land thus takes on the characteristics of a consumer good with a flexible demand in relation to income and a notably limited and hence rigid supply. The statistic correlation between land values and GIPpc is rather high and significant ($r = 0.88$, sign. t > 0.01).

The feeling is however that, as often occurs in analysis of time series, the explanation proposed is only one of the possible explanations for the trends in land values. There are in fact other basic trend variables which have influenced land values (above all, agricultural revenues). Short-term variables have also had an important role to play. For example, one cannot disregard the fact that the most significant increases in land values (in the years 1973-75 and 1978-80) occurred when the levels of Gross Internal Product were stagnant. These were the years of evident economic crisis: stagnation and high inflation rates evidently encouraged land investment (in the absence of alternatives). On the other hand, the falls in land values generally correspond to growth trends in Gross Internal Product (the years 1968-73 and 1982-88). However, it is somewhat difficult to find years in which stagnation in land values corresponds to stagnation in GIP (1980-82): on closer examination, it appears that land values fell in this period because previously they had reached levels that were too high for the market. It appears clear then, even on brief analysis, that short-term factors interact with long-term ones, thus complicating the analysis.
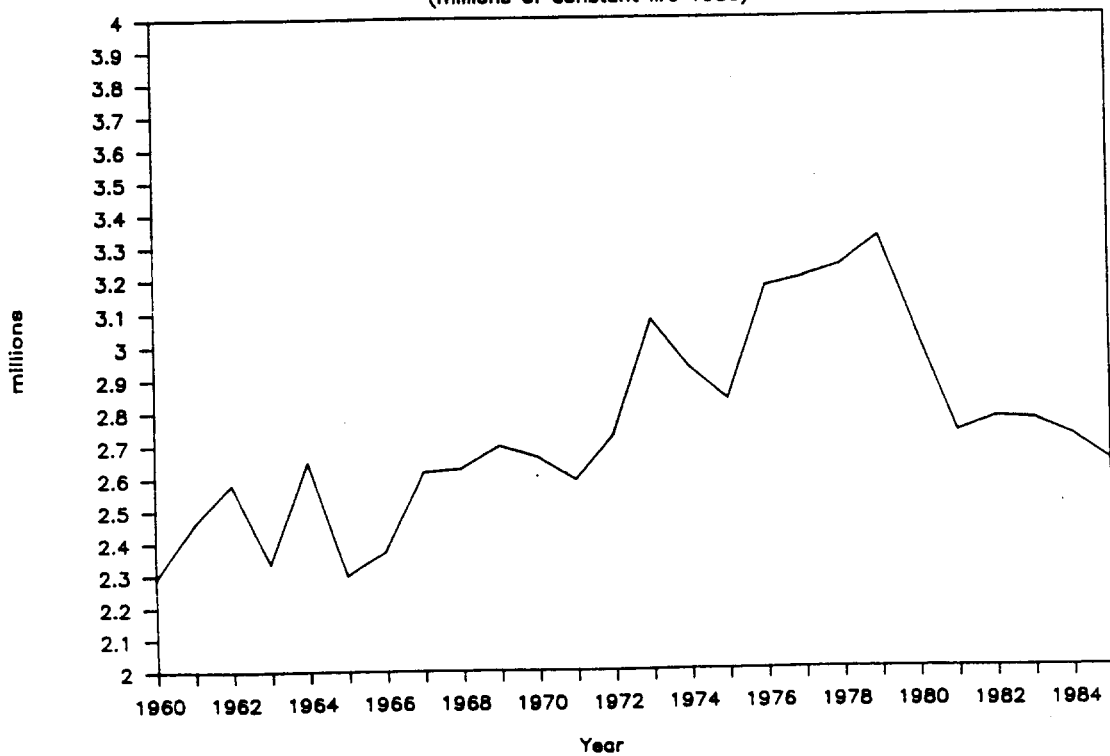
3.2 Agricultural Revenues and Technical Progress: Added Value per Hectare, Agricultural Prices and Added Value per Farm Worker

Added value per hectare (fig.4) -which can in a sense be considered a proxy for soil rent- underwent significant

Fig. 3 — G. I. P. per capita
(millions of constant lire 1986)
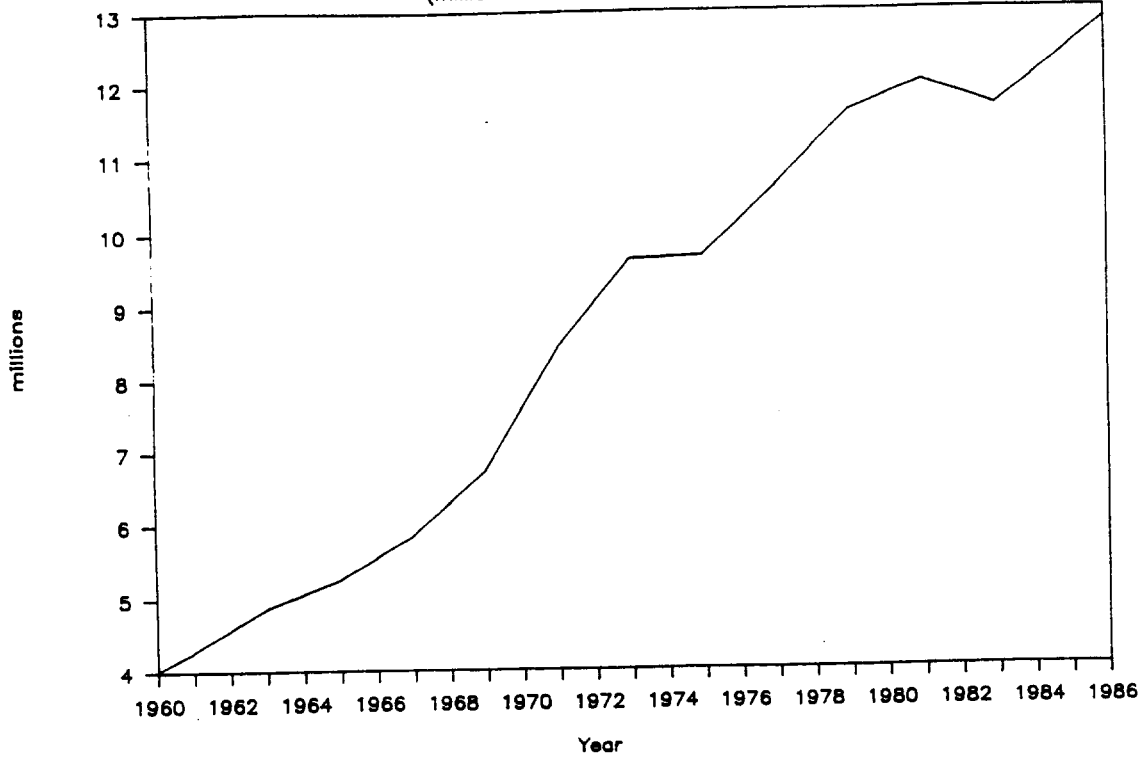
Fig. 4 — Agricultural Added Value/ha
(millions of constant lire 1986)

7

variations over the three decades. However, at regional
level it increased by 10-20% in real terms (from 2 to 2.5
million lire/ha), an increase which all in all was not
particularly significant. The increase is greater, however,
if the mountain and hill areas are not counted, but does
not in any case justify the increases in land values. It
should be noted, however, that the increases in added value
per hectare show some degree of correlation with trends in
land values, as seen in the notable increases in the years
1973-75 and 1978-80. The two variables show a limited
correlation (r) equal to 0.66, but which is nevertheless
significant (sign. t > 0.01).

On the other hand, one should discard any hypothesis
regarding correlation with the prices of the main
agricultural products in Veneto (maize, milk and wine)
which fall in value in real terms (fig.5), so that the
increase in added value per hectare can only be due to
increases in productivity.

It would seem that technological progress -roughly
measured by the amount of land per farm worker (ha/worker)
and by the added farming value per farm worker (AV/work)
(figs. 6 and 7)- is more closely correlated with land
values than added value per hectare. Over the three decades
considered the acreage of land per worker was tripled (from
3 to 10 hectares) (fig. 6), in the same way that the added
farming value per worker (fig. 7) increased in real terms
from 6 to 24 million lire/ha.

Analysis of these different trends in land and labour
productivity (fig.4, 6 and 7) shows a clear statistical
relationship between land values and revenue per worker (r
= 0.89, sign. t > 0.01), rather than between land values
and land earnings alone (r = 0.66, sign. t > 0.01).

It may be claimed that there is a cause - effect
relationship between agricultural revenue per worker and
land values, to the extent that the buyer does not simply
intend to acquire the income from the land but rather the
aggregate of incomes related to farming. This hypothesis
may be accepted in cases where the purchasers are
themselves farmers, belonging to the category which, as
many surveys have shown, is the most active in the land
market in the Veneto Region.

Of course the analysis undertaken so far, along with
the relative statistical data, leave some doubts about
which is the most important variable in determining land
values: agricultural income, which should express the value
of the land as a productive factor, or the whole Veneto
population income per capita (GIPpc) which should express
the value of the land as a "consumer good". Although this
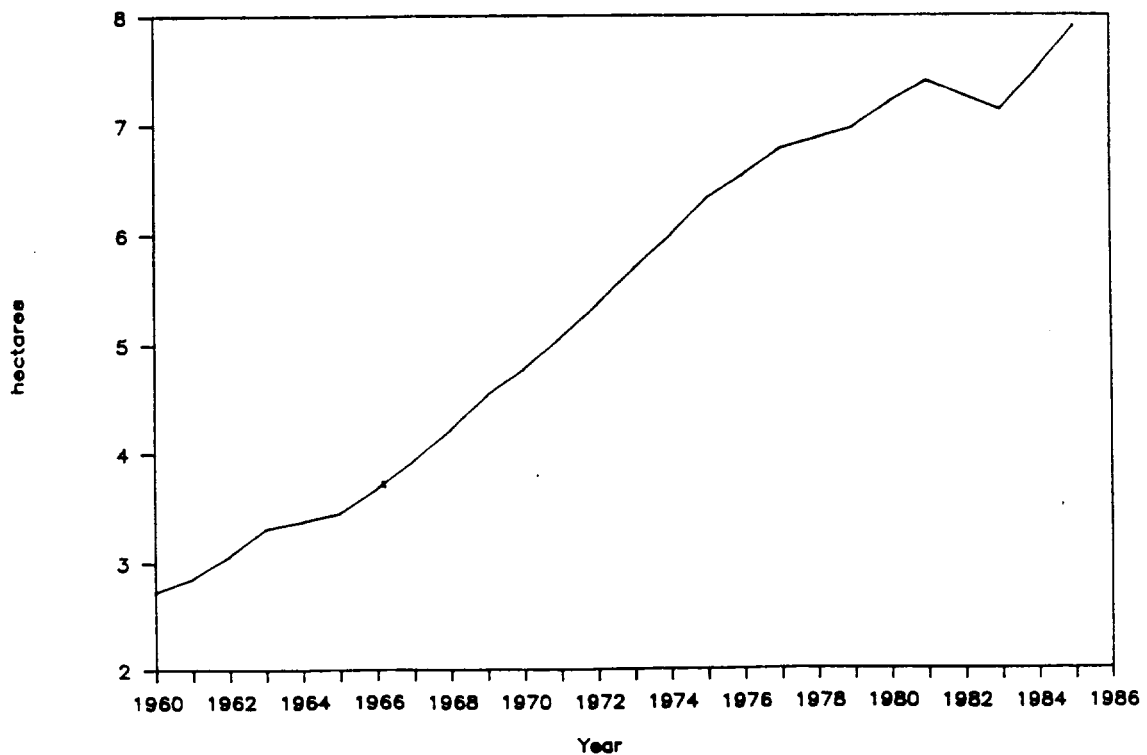is difficult to demonstrate statistically (3), both these

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(3) The relationship between Land Values, GIPpc and AVfw shows the following parameters:

LV = -10005.671 + 4.2896 GIPpc R^2 = 0.76
(sign t>0.05)(sign t>0.01)   DW = 0.45

Fig. 5 — Agricultural Product Price

(thousands of constant lire 1986)

Milk

Maize

Quality wine
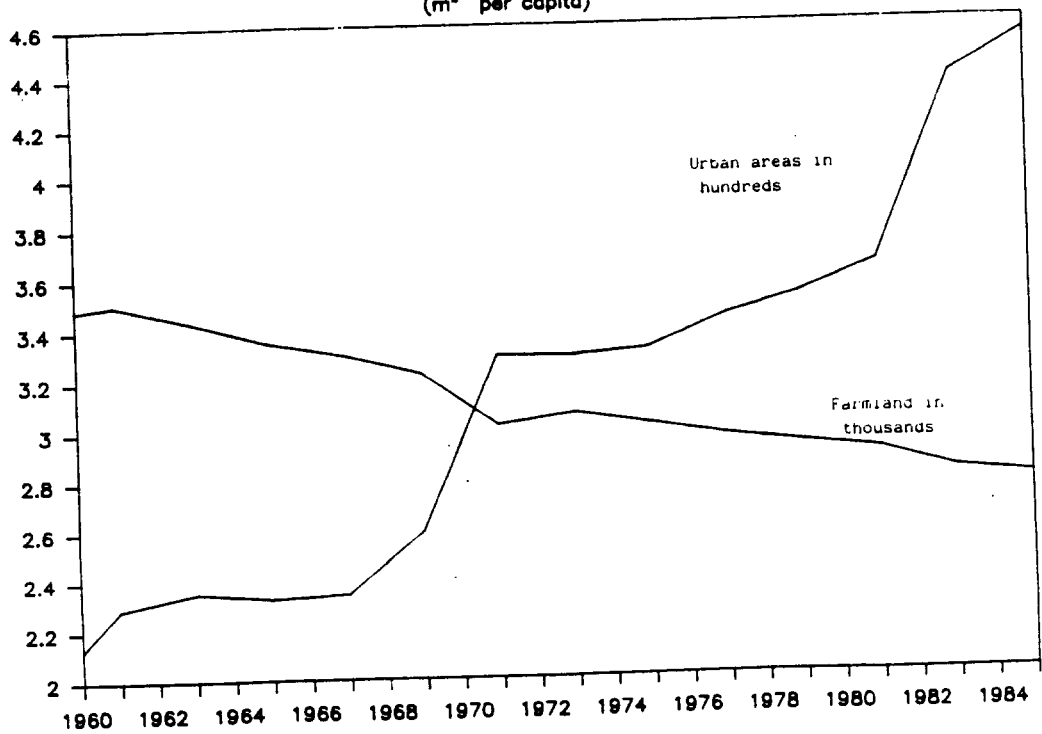
Year
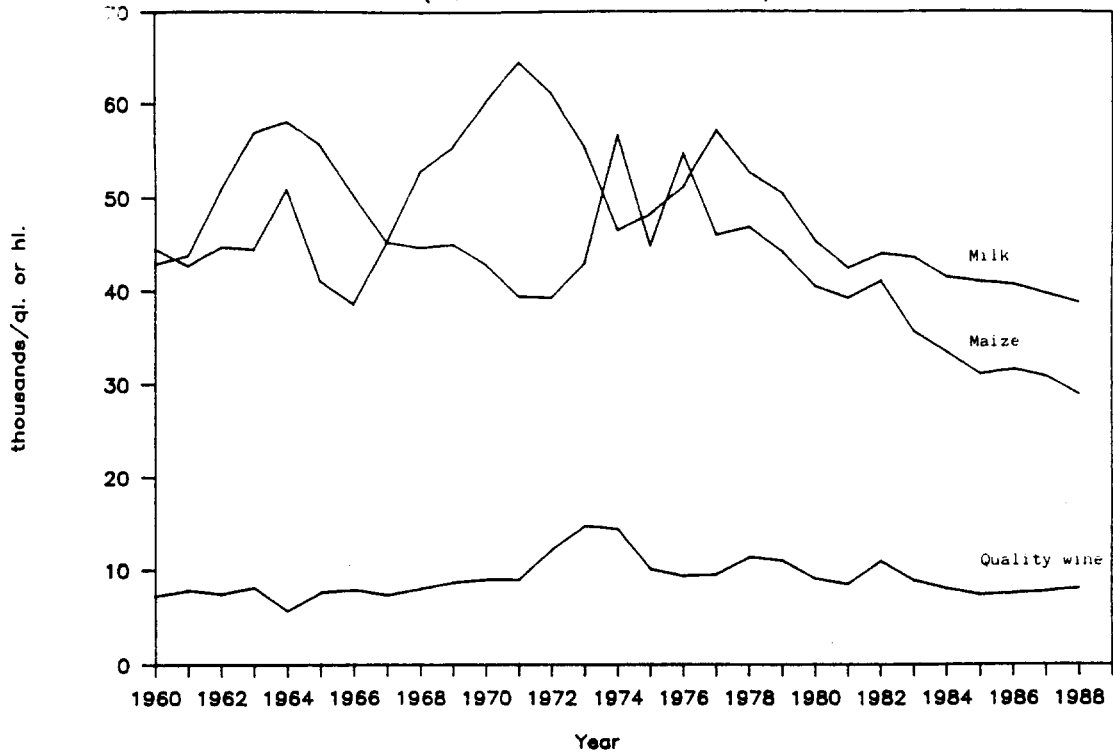
Fig. 6 — Farmland/Worker

Year

Fig. 7 -- Agricult. Added Value/Worker

(millions of constant lire 1986)

millions

Year
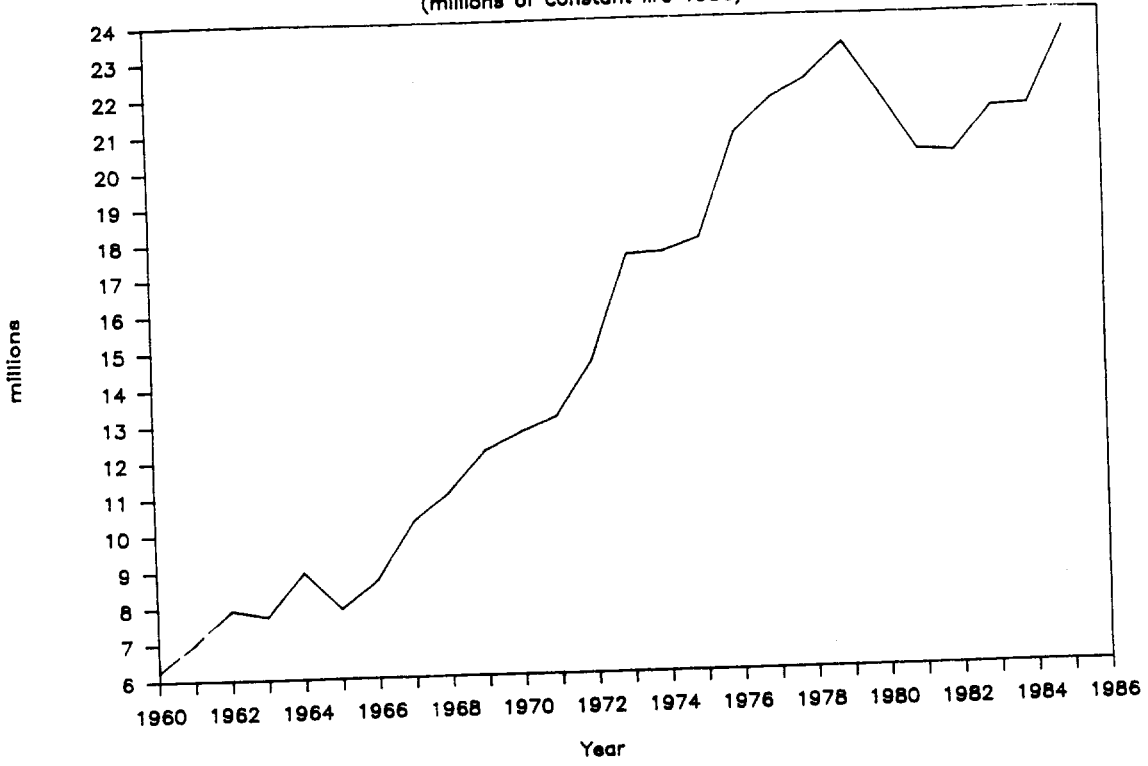
Fig. 8 – Land Use

(m² per capita)

Urban areas in
hundreds

Farmland in
thousands

10

factors seem to have contributed to the increases in land values, and it can be claimed that they act together, sustaining one another, as such large increases cannot be explained otherwise.

3.3 Land Availability and Settlement Patterns

Given that income (both agricultural and non-agricultural) plays an influential role in defining land values, one should also point out other factors which have contributed to real growth in land values. First of all, the scarcity of farmland (3,000 sq.m per capita) should be stressed accompanied by widespread settlement patterns and industrial development throughout the rural areas which have interacted and competed with agriculture in the demand for land.

Over the period considered the extension of urban growth per capita more than doubled (fig.8), displacing agriculture over the most fertile areas where settlement patterns were historically more intense. At the same time the amount of farmland was significantly reduced, due to both urban expansion and abandonment of mountain and hill areas which had become economically sub-marginal due to the difficulties of mechanisation.

The scarcity factor (or rigid supply) can thus be considered to be a main reason for the increase in land values. The correlation between land values to urban areas per capita ($r = 0.72$, sign. $t > 0.05$), or farmland per capita ($r = 0.82$, sign. $t > 0.05$), undoubtedly contributes to explaining the increase in land values.

However the first factor in determining the increase in land values appears to be that of income (largely responsible for the increased demand for land), while the scarcity of land (or rigid supply) played a consequent role. This is demonstrated by the fact that the most relevant increases in land values occurred in the central plain and pre-mountain areas of the region (Treviso, Padova, Vicenza and Verona) where the population density is higher (inhabitants per sq.km) and where economic and industrial development is more intense and scattered in rural areas with respect to the other peripheral areas -the provinces of Rovigo and eastern Venice and the mountains- where the population density is lower and decentralised economic development in the countryside is practically non-existent.

It is particularly interesting to compare land prices in the central plain (46 million lire per hectare according to our survey and 40 million according to INEA Report) with

$$LV = -6042.164 + 2.129AVfw \qquad R^2 = 0.79$$
$$\text{(sign } t > 0.1) \text{ (sign } t > 0.01) \qquad DW = 0.76$$

The regressions were carried out with the ordinary minimum squares method, using the TSP programme on PC.

the southern (Rovigo) and eastern (Venezia) plains (33 million lire per hectare and 30 million according to INEA Report). It can be seen that prices increased at much lower rates in the peripheral plain with respect to the central areas of the region though agricultural productivity and revenues are practically similar, if not higher (see fig.1 showing the map of the Veneto Region indicating the peripheral and central areas).

3.4 Agricultural Financing and Alternative Investments: Housing and Stock Market

Low-interest subsidised loans to family farmers for purchasing land no doubt played an important role in the '60s in sustaining land values (fig. 9). In more recent years such interventions came to end due to the lack of public financing, while the normal financial system probably played a role only in the early '70s when bank rates were lower than the inflation rate. However, it can be claimed that, over the last ten years, the high interest rates applied by the banks -operating without public subsidies- have practically excluded the role played by financing in defining land values.

With regard to alternative investments -housing and shares- it seems that they played a "controlling" role in the land market, by widening the range of investments which were traditionally restricted for the Venetian rural population to purchasing land. The average saver in the '60s and '70s may well have considered housing to be an alternative to the purchase of farmland. Both these assets have the advantages of (i) guaranteeing the real value of the investment, and (ii) being easy to manage. Both types of investment appear to have followed similar trends related to financial variables (inflation, interest rates), as shown by fig. 10.

As far as shares are concerned, the trends are notably differentiated from those of land values. Over the thirty years considered share prices fell significantly with respect to land. Between 1960 and 1980 there was a net decline in average share prices expressed in constant lire (1960 = 100) which was only partly recovered by the free distribution of shares and dividends (which were certainly higher than soil rent). Only by restricting the comparison to the last decade (1978-88) does the value of shares become competitive with that of land. In reality, if there had not been the boom in the stock market in the years 1984-86, linked to the relaunching of Italian industry, the real value of shares would not have covered the inflation rate.

Thus it can be claimed without any doubt that investment in good farmland on the plain and in the hill vineyards in the Veneto provided much more satisfactory results than investments in the stock market (fig. 11). If the analysis of land prices over the period from the '40s to the '60s carried out by Ferro (1968) led to conclusions

in favour of land investment as opposed to shares, the last thirty years support this view all more. 100 lire invested in land in the Veneto region in 1966 had become 2,000 lire by 1985, while the same amount invested in shares was worth 600 lire. However, it should be noted that such an increase, clearly shown in the Veneto Region, did not take place throughout the whole country, as Grillenzoni's analysis shows.

In any case, analysis of trends in share values brings out a clear differentiation between the land and the share markets, showing that completely different subjects are involved in the two markets: farmers in the land market and savers and financial operators in the stock market. It should not be disregarded, however, that the notable increases in the unit price of large farms occurring over the past 2-3 years could in a sense be connected with the profits made in the stock market over the period 1984-86 (along with relative de-investment). However, analysing the typology of purchasers of large farms, it appears that they consist largely of local industrialists, traders and economic operators who often have economic and cultural ties with the agricultural world.

4. Short-term Trends in Land Values: Annual Variations in Land Values, the Inflation Rate and other Financial Variables

The above consideration of trends in agricultural financing, in the housing market and share prices, has to some extent brought the analysis of the land market to the level of short-term factors. It clearly shows the influence that financial variables may have on real trends in land values. The most evident aspect is inflation which, as various authors have already pointed out, seems to clearly influence land values in real terms as well as current ones. This relationship is illustrated in fig. 12, showing the **real land values** along with the inflation rate. It appears evident that growth in the inflation rate involves increases in land prices in real terms. One could also suppose from the graph that a role is played by the expectation about future inflation rates, so that land values increase when there is expectation of inflation, while an opposing trend appears to occur when the inflation rate is falling. It should be noted that it is double-figure inflation (above 10%) which especially influences land values. One could also suppose from the graph in fig. 12 that inflation has an amplified effect on current land values, in the sense that increase in inflation rates (fig. 13) involve percentage variations which are more than proportional in land values (figs 13 and 14). In 1973, for example, the price index rose by 15%, while the price of land rose by 50%. Similarly, an increase of 10% inflation rate over 1978-80 brought about a 30% increase in current land values.
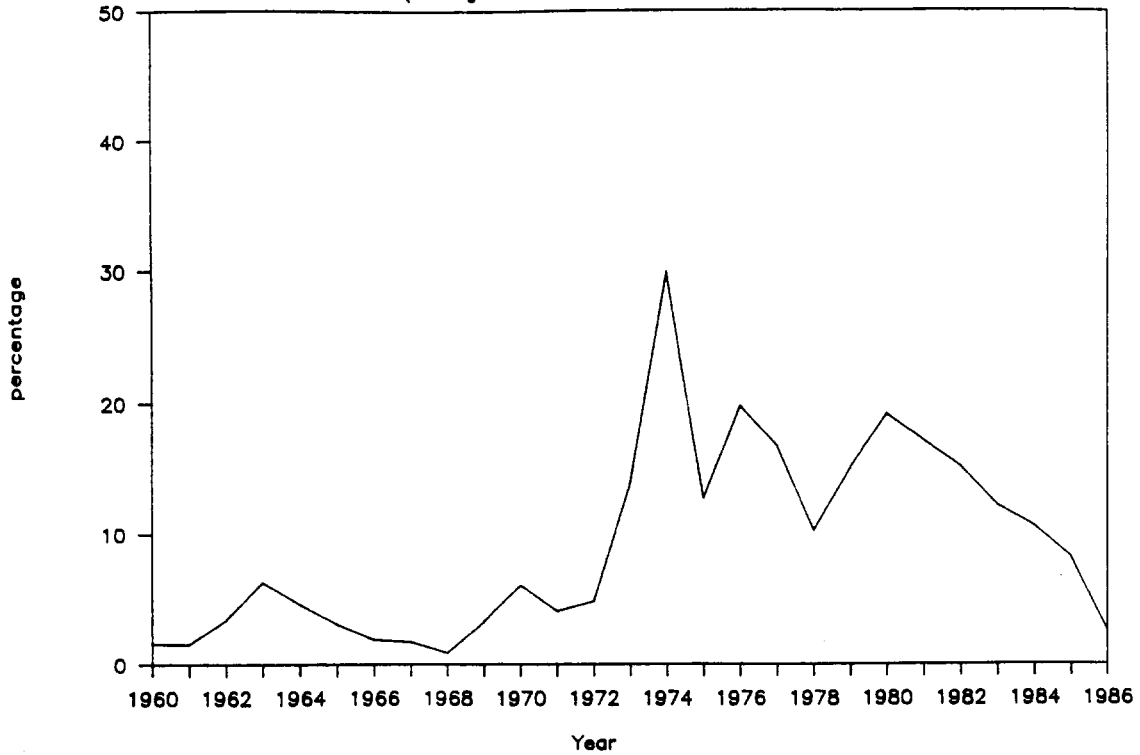
13

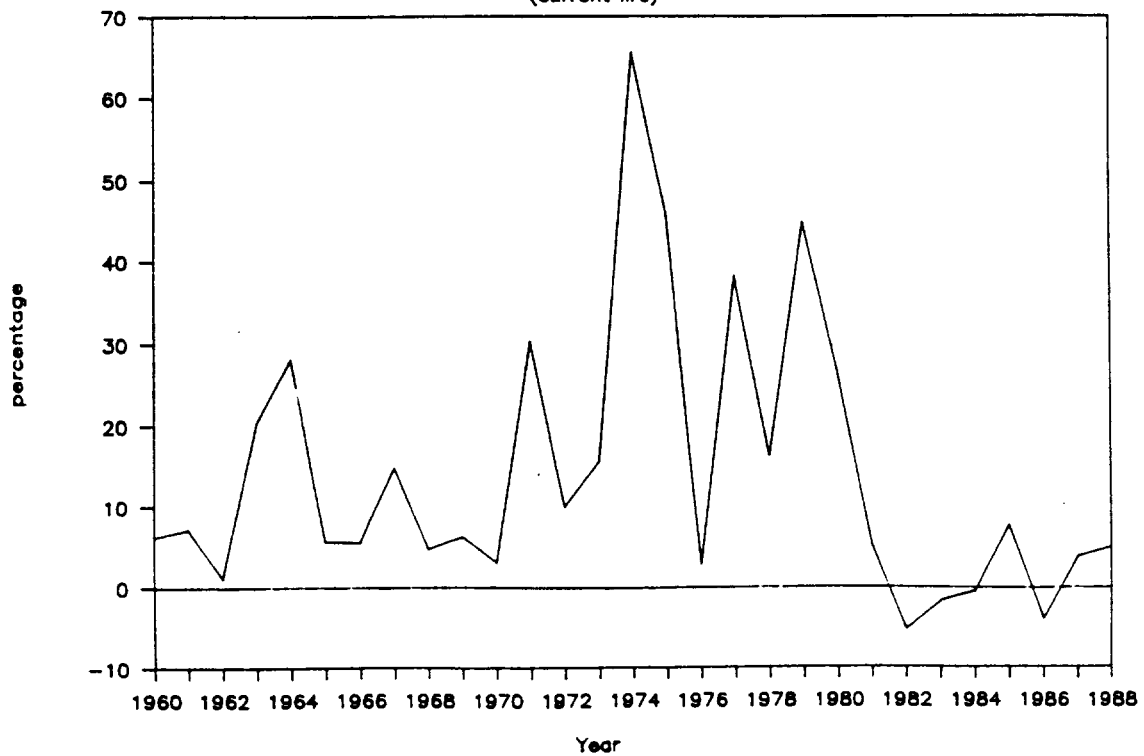## Fig. 11 — Average Share Price
(index of real value)
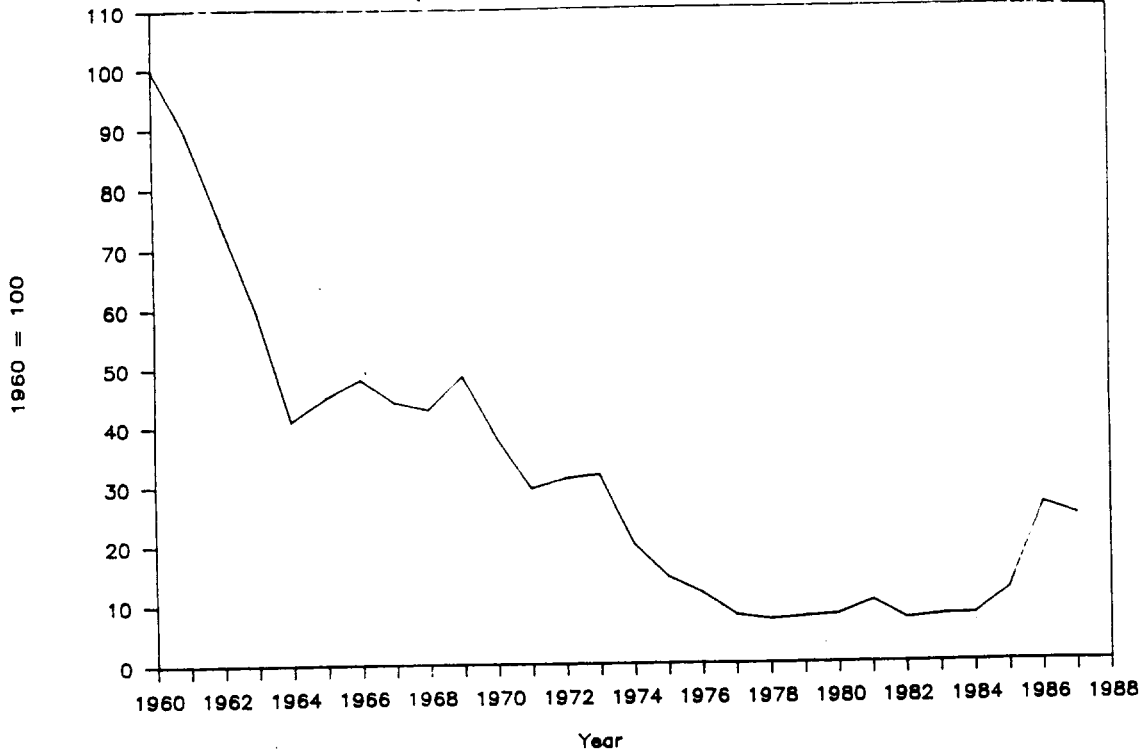
Fig. 12 — Real Land Value and Inflation
(mil. of lire 1986 — inflation rate)
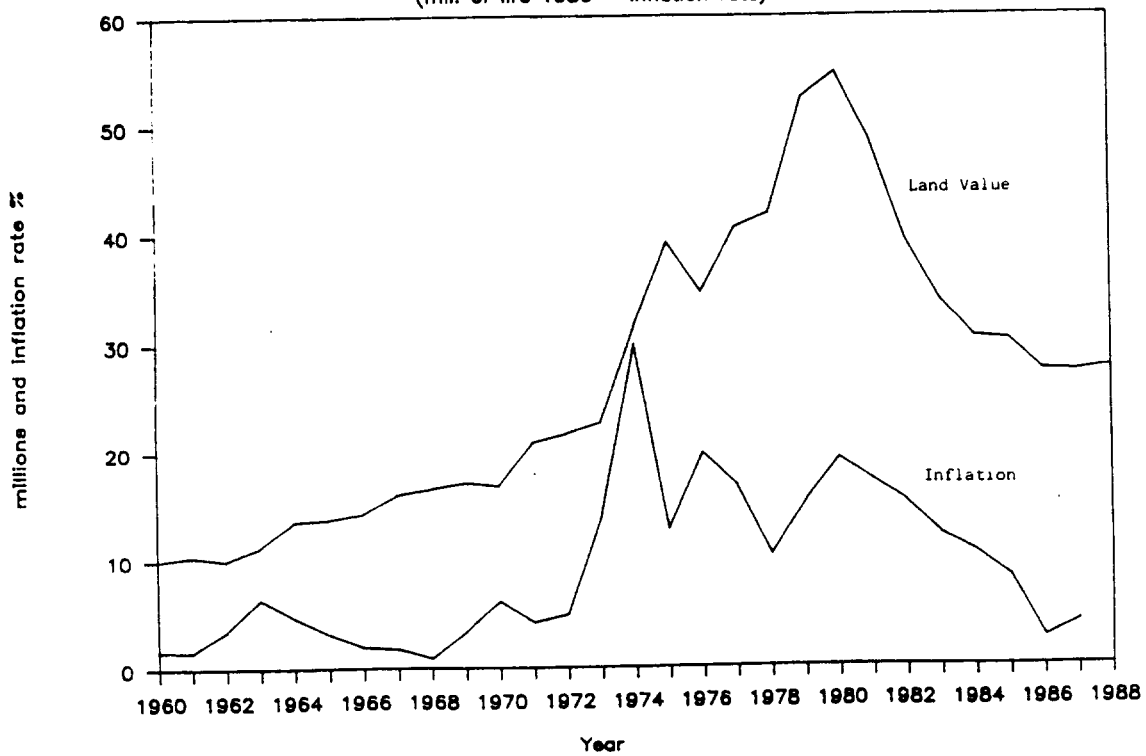
Fig. 13 – Inflation Rate
(average retail and wholesale prices)

Fig. 14 – Variation in Land Value
(current lire)

Thus it can be concluded that inflation is a key variable for explaining alternate trends in the land market, not only in current terms (which is rather obvious), but also in real terms, a further demonstration that inflation (as a financial variable) has clear effects on the real economy. Further confirmation of these effects on land values are provided by examination of the Bank of Italy discount rate and the interest rates from state bonds and stocks which are clearly linked to the inflation rate (figs. 15 and 16).

5. A General Model of Variables Influencing Land Values over the Period 1960-85.

In order to undertake a global evaluation of the above-mentioned phenomena, an explanatory multiple regression model of the real variations in land values was constructed on the basis of the time series 1960-85. Parameters were introduced into the model according to their role in explaining trends in land values (R^2) and the significance of the relationships (4).

With all the limitations involved in such exercises, the following model was considered to be satisfactory as an initial approximization:

$$LV = -31612.0 + 2.48 GIPpc + 11.54 AAVha + 602.54 VAPI \qquad \begin{array}{l} R^2 = 0.832 \\ DW = 1.12 \end{array}$$
$$\text{(sign. } t > 0.01)$$

where:

GIPpc = Gross Internal Product per capita (constant values, expressed in thousands of lire, 1986).

AAVha = Added Agricultural Value per hectare (constant values, expressed in thousands of lire, 1986).

VAPI = Inflation rate: variation in the Average Price Index (wholesale and retail), expressed as a percentage.

Basically the model confirms that the real land values are influenced by the flow of wealth produced, by land revenue and the inflation rate. However, the following points can be made with respect to the equation and coefficients. First of all, the variability explained appears to be satisfactory with an adjusted R^2 equal to 0.832; meanwhile, the significance of the regression coefficients is high. The major limitation in the model is the low value of the Durbin-Watson coefficient which does

(4) The regressions were carried out with the ordinary minimum squares method, using the TSP programme on PC.

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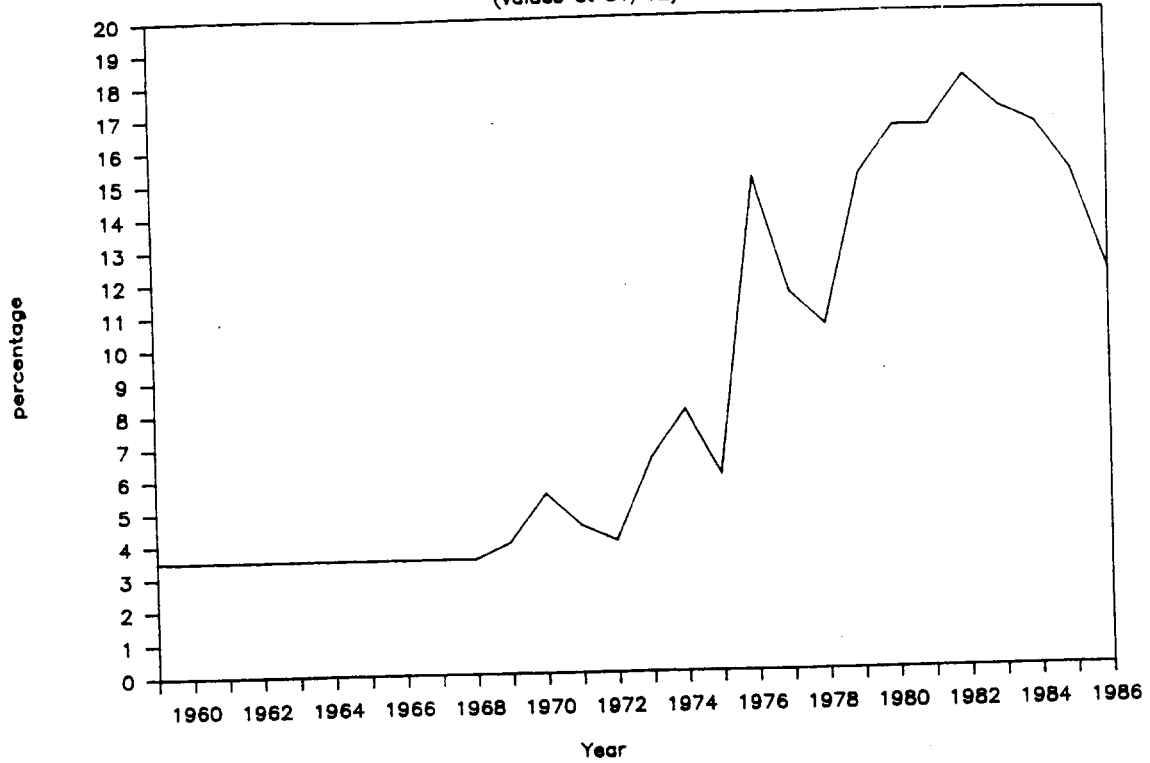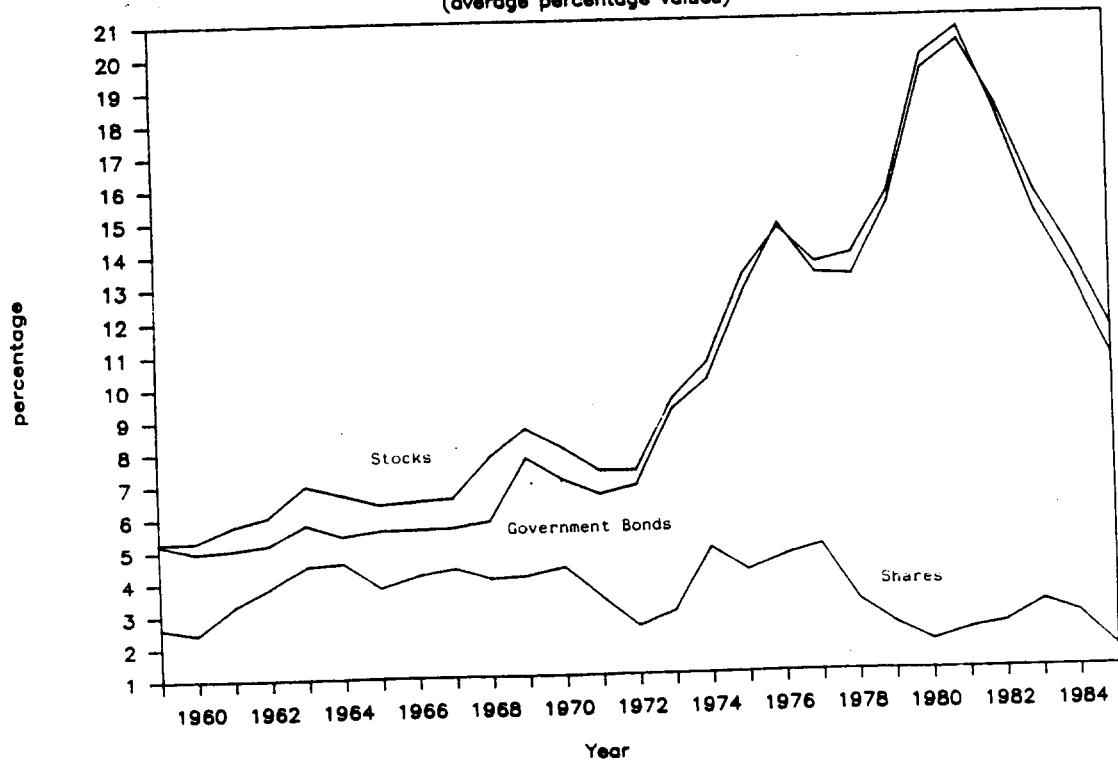## Fig. 15 – Bank of Italy Discount Rate
(values at 31/12)

Fig. 16 – Share and Bond Revenue
(average percentage values)

Stocks

Government Bonds

Shares

not exclude correlation in the residuals and hence the presence of "hidden factors" that may contribute systematically to trends in land value (5).

6. Values Related to Farmland Features

6.1 Settlement Patterns and Economic Development

The trends in land values shown by figs. 1 and 2 underline that more significant increases occurred in the central Veneto plain and pre-mountain areas with respect to the southern and eastern plains and the mountain areas.Land prices in fact underwent greater increases in the areas characterised by more intense economic development, more widespread settlement patterns in the countryside and higher population densities.

These data emerging from the annual INEA statistics were further confirmed by our survey of land values over the three year period, 1986-88:

Areas		Our Survey	INEA Report
- Central Veneto plain	mil./ha	46	40
- Southern and eastern Veneto plain	"	33	30
- Mountain areas	"	24	25

This is further confirmation of the fact that the spread of development in rural areas involves obvious increases in land values, as indicated by other analyses (Grillenzoni 1981).

6.2 Farmland Features and Prices

The sample survey allowed to move the emphasis in the analysis from dynamic factors acting over time to spatial factors (cross sectional data) connected with the farmland features. The survey, conducted with a questionnaire, involved 75 cases of land transactions occurring during the period 1986-88 and regarding large and small farms as well as single plots and parts of farms. The data were supplied by agriculturalists (university graduates) working locally as consultants, surveyors or in the regional extension service.

Without presuming that the survey provides a significant picture of the land market in the Veneto region

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(5) Given the complexity of the phenomenon described and the difficulty of obtaining reliable data previous to 1960, it seems to be difficult to overcome this limitation without introducing a large number of variables into the equation. However, most of these variables have low significance values and it is difficult to define their precise role in the scenario in which land values are formed.

(the sample seems biased by information sources), the following data emerged from it:
- **average land price**: 35 million lire/ha;
- **seller typology**: 25% working farmers, 19% farmers, 13% employed in different fields, 11% traders, 32% other categories;
- **buyer typology**: 43% working farmers, 29% farmers, 29% other categories;
- **pre-emption rights** were exercised in 23% of the cases, and could have been exercised in another 30% of the cases; they were non-existent in the other cases;
- **total acreage of land transacted**: ha 2428 (5-10% of the annual acreage transacted);
- **average acreage of land transacted**: ha 32.4.

Correlating the land values and farm features, it appears that in general land values increased according to: (i) productivity and revenue; (ii) settlement patterns and development (central or peripheral areas); (iii) the volume of the farm houses and related buildings; (iv) the farm investments such as orchards; (v) the facilities (particularly accessibility); (vi) the possibility of mechanisation; and lastly, quite important, (vii) the quality of the environment (landscape amenities etc.).

Factors which do not appear to influence land values seem to be the distance from town centres and farm size. Though these last results appear to partially contradict previous analyses (Grillenzoni, 1982), they may be due to distortions in the sample. However, one should not discard the hypothesis of a certain evolution in the land market during the second half of the 80's. It could be explained, for example, that in a context of dispersed and decentralised settlement patterns, the distance from town centres is no longer an influential factor on land values. This point also emerged from other surveys carried out in the Veneto Region (Merlo, 1980).

Farm size, in the sense that smaller farms or single plots of land ought to obtain higher prices per hectare as there is a greater demand for them, may no longer influence land values, since there are purchasers with sufficient financial resources to acquire the larger farms and who are willing to pay a higher price per hectare, as they are aware that scale economies can only be realised in farms of a certain size. The survey in fact shows that some of the highest land prices were paid for average if not large-scale properties, for which there has been a great demand in recent years.

An explanatory multiregression step-wise (SPSS programme) model can now be presented with regard to the relationships existing between prices and farmland features. The relationship identified at regional level is the following:

$$LV = -5.852 + 9.57R + 6.259EQ + 5.7Pc + 0.036CM - 0.234NM$$
$$\quad (*) \qquad (**) \qquad (**) \qquad (*) \qquad (**) \qquad (**)$$

$(*)$ = sign t>0,05; $(**)$ = sign t>0.01; $R^2 = 0.62$

where:

LV = land value per hectare, in millions of current lire 1986-1988

R = soil rent, (imputed according to standard revenues) in millions of lire per hectare

EQ = Environmental quality expressed on a scale from 1 (very poor) to 6 (excellent)

Pc = dummy variable (1/0) indicating whether the farm is situated in the Central Veneto plain

CM = cubic metres of farmhouse and buildings per hectare of farmland

Nm = percentage of non-mechanizable farmland

The main problem with the model resulting from the sample survey data is due to the fact that it refers to the land market in the whole region, while local peculiarities and factors are not taken into account. In other words, the model does not allow for internalisation of the various typical local factors which often play a decisive role in the formation of land values.

In order to improve the analysis an attempt was made to build different models for individual sub-regional areas. Despite all their contradictions, if not controversial aspects, the results undoubtedly support the idea of a land market which is closely connected to the local context and is affected by local factors which differ from one area to another.

For instance, the data obtained from the survey, already tested in the general model, allow one to build a land market model for the mountain areas in which the independent variables provide a good explanation of land prices variability $(R^2=0.89)$. To a certain extent land prices can be explained by the independent variables resulting from the survey also in the peripheral plains $(R^2=0.60)$.

As far as the central plain and the pre-mountain areas are concerned, the information obtained from the questionnaires did not allow us to identify sufficiently reliable relationships. This difficulty may be due to the fact that, in areas of more intense non-agricultural economic development, such as this one, the influence of local factors external to agriculture is dominant with respect to the farm features considered by the questionnaire.

7. Economic, Legal and Institutional Features of the Veneto Land Market (Some remarks)

No firm conclusions about land market situation and evolution certainly emerge from the present analysis. Further analysis: data collecting and reliable models are needed. However some remarks about the economic, legal and institutional features of land market can be put forward. Particularly in analysing the land market in Italy, and in Veneto, account should be taken of the following aspects:

(i) The land market is extremely hypothetical; the annual transactions are limited to 1-3% of the total land, as various surveys have shown (Vanzetti, 1965). In the entire region the quantity of land transacted annually amounts to 15-40,000 hectares, of which about 5-15% (about 2,000 hectares) is devoted to urban uses. Besides it seems that in periods of high inflation, the number of transactions is significantly reduced to about 1% of the total land (Merlo,1980).

(ii) Settlement patterns, rural industrialisation and urban growth seem to play a key economic role in the land market, especially in the central plain where agricultural features are becoming less and less important in determining land values.

(iii) Limited supply is the main typical feature of the land market which appears to be monopolised by sellers (Ferro 1968, Einaudi, 1934). Often it can be a matter of a duopolistic bilateral market between seller and buyer, constraint by the legal context of the land market.

iv) Pre-emption rights -and the fiscal benefits provided by law for working farmers and to some extent for farmers fully involved in farming- move the market in favour of these categories, as this survey and previous research have clearly shown.

(v) It is certainly not easy to forecast future development: however, market evolution and agricultural land policies should act, hopefully, in order to increase land mobility in a more flexible context. **Market evolution,** in the sense of scale economies obtained through consolidation, careful attention to farm structure, should assume central importance in the market (supply and demand sides). **Agricultural and land policies,** after years of increasing legal constraints on the land market, seem to have reached a turning point represented by the 1982 Tenancy Law. There is a growing awareness that farm structures should be protected not only for farming and productivity purposes, but also because the need is felt for more effective environmental policy (landscape conservation, pollution, etc). New legislation concerning tenancy could also influence and relax the tension in the farmland market.

(vi) Recent analysis concerning the rural situation in Northern Europe points out the danger of "strong agricultures but weak rural economies" (Wibberley, 1981). The opposite is true in the Veneto and the other Italian

regions where the rural economies are much stronger thanks to industrialisation and urban growth, as compared to agricultural economies (poor farm structures and rural environment). The new trends towards environmental and agricultural practices, management agreements, environmental policy, acknowledgment of property rights (rural land as a public good) are all factors that should determine new evolution in the land market.

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