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Toward a Behavioral Model of Multiple-Job-Holding Farm Families

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Abstract

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This paper applies a multidimensional method and a structural approach to the results of research based on a field survey on the origins of pluriactivity and on the attitudes of farm families toward multiple job-holding and full-time farming. Multiple correspondence analysis makes it possible to consider jointly, from a static and dynamic point of view, several quantitative and qualitative variables concerning the family, the farm, and the socio-economic context. A typology of seven groups of farm families is established by means of cluster analysis.

The typology shows that the dichotomy between pluriactive and full-time farms does not account for all of reality: a great deal of diversity exists within both groups. The major factors which explain pluriactivity and condition its performance are identified and interpreted. The implications, in term of agricultural, socio-economic and environmental policy, of the evolution of the family farms of each type are then described and analyzed.

The essay concludes that future research on pluriactivity ought to pay more attention to the dynamic variables originating both within the farm families and in the socio-economic context.

Introduction

Currently, a great deal of attention is being devoted to pluriactivity as an increasingly widespread form of adaptation of farm families to change, and as an important factor in the interpretation of many micro- and macro-economic phenomena (the farm and its transformations on the one hand, and labor market, rural development and land use on the other).

New empirical studies have filled the gaps of official statistics, by taking into account the pluriactivity of the whole family or household, rather than that of the operator only. The family is, in fact, the decision-making unit for labor

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allocation, income and consumption, and therefore most researchers agree that it should be the basis of analysis.

The lack of a theoretical framework, however, leaves many methodological and conceptual problems unsolved (Cavazzani and Fuller, 1982; Abercrombie, 1983; Fuller, 1984; Lacombe, 1984). The farm family is a complex subject, and there is yet no complete analysis of the relationship between decision-making processes, which involve the family as a whole, and individual choices of its members. Therefore, in the past much research has used a more traditional approach, focused on the farm or the operator rather than on the family.

Also, not enough is known of the several variables affecting farm performance and family decision-making, nor of the ways in which the choice between full-time and pluriactivity influences the farm's organization and the productivity of the different factors, through technological change, accumulation and 'deactivation', caused by the use of services offered by external firms (e.g., contracting).

Italian research on pluriactivity is characterized by a higher incidence of mostly descriptive structural analyses, often resulting in the definition of typologies, rather than in theoretical explicative models (Anania, 1981; Pieroni, 1983; Marini, 1987). Indeed, models that can be used as a frame of reference on a theoretical level are derived from a neoclassical, basically static approach. In this field, however, the usefulness of this approach is limited, since, as many recent contributions have stressed, we need a dynamic theory capable of dealing with interdisciplinary dimensions and with questions of agricultural and rural policy (Fuller, 1984; Lacombe, 1984; Eboli and Turri, 1987; Gasson, 1986). A typological approach, on the other hand, can lend itself more easily to a normative intent in a dynamic dimension.

Research goals and approach

The aim of the present paper is to establish a typology of farms and farm families, drawing from a field survey elements which may be used to create an explanatory model of pluriactivity in agriculture, by identifying the motivations of pluriactivity, its performance as compared to full-time farms, and its evolution in the context of socio-economic and agricultural policies.

In order to include all the characteristics relevant to the analysis of pluriactivity, without a pre-defined set of hypotheses, we need to use a large number of variables concerning the operator, the farm, the family, and their context. We also need a method of analysis capable of simultaneously treating quantitative and qualitative variables, and an approach that can rank farms and families according to their different features.

Multiple correspondence analysis is an appropriate method for the handling of categorical data, and for the study of the relationships between units and variables. Thus, in a large set of data we can determine the most relevant fac-

tors for synthesizing the original matrix (Benzécri, 1973; Deville and Saporta, 1983). Each family farm will be defined, rather than by numerous descriptive variables, by a smaller set of coordinates which point out its location in the space of the principal factors. By means of these coordinates, cluster analysis ranks the individuals in homogeneous groups, establishing a typology of family farms.

This paper uses data from a survey carried out in the Sacco river valley in the Frosinone province (Lazio, Central Italy), south of Rome. The Sacco Valley can be described as intermediate between the two types most commonly found in Italy: areas of long-standing and/or widespread industrialization, and areas where poor natural resources combine with a lack of non-agricultural employment opportunities. Here industrialization was created in the '60's by public intervention, in an environment of traditional family farming. A detailed description of the area, as well as of the sampling methods used, is given in Castellucci et al. (1984).

The survey covered a sample of 200 farm-operating families and farms, with sizes between 3 and 20 ha. Our terminology will reflect the fact that certain characteristics of the farm may be the result of certain characteristics of the family (e.g., 'old' farms). We consider as part-time (PT) or pluriactive family farms (mixed-income farm families) all units where at least one member worked off the farm, either in agriculture or in other sectors. 'Professional farming' describes the presence of an active family member working at least 1000 hours per year on the farm, as opposed to 'accessorial farming', where all active members are mainly engaged in off-farm activities, or all family members are above 65 years of age. The other variables used concern: (a) the structure and evolution of the farm family; (b) the quantitative and qualitative composition and dynamics of family labor; (c) family income and composition; (d) the operator's age, education, experience and entrepreneurial ability; (e) farm structure and evolution; (f) production results and market outlets; (g) technology and economic viability; (h) short- and long-run prospects; (i) demographic and economic features of the context.

The static variables refer to the year 1980; the dynamic variables concern the years 1960 to 1980.

Multiple correspondence analysis

The factors with the highest influence on the all-round variability of these farm families are, in order of importance:

(1) Age. One end of the axis shows farms with a very old labor force, employed full time on the farm, with no future prospects; the other shows farms on which families are younger and have recently turned to pluriactivity.

(2) Economic goals. The axis opposes productive functions and dynamic development prospects against subsistence functions, represented mainly by a

high incidence of auto-consumption. On the plane formed by the first and second axes, the variables assume a triangular shape, which identifies three groups of family farms: full-time farms with a very old family, productive pluriactive family farms, and marginal pluriactive family farms.

(3) Labor/production relationships. At one end, this axis shows labor-intensive farms; at the other, we find an organization of production based on a limited amount of family labor and a high incidence of contracting — a situation which we describe as 'deactivation' of farms.

(4)-(5) Family structure. Axis 4 opposes the nuclear versus the multigeneration family, axis 5 repesents the change of the operator. The plane formed by these two axes corresponds to the family structure; the variables assume a triangular disposition, which identifies three types of family structures: the nuclear family, the multigeneration family with succession, and the multigeneration family with no or delayed succession.

(6) Type of off-farm employment in the family: steady vs. unsteady off-farm employment.

Typology

Cluster analysis identifies seven types of farms (see Table 1): three types of full-time farms (old, persistent, professional), and four types of pluriactive family farms (productive, dynamic, precarious, subsistence pluriactive farms).

About half of the *'old' full-time farms* (OFT) have lost their previous tie with the off-farm labor market and have become full-time because of old age. The family usually includes only the two parents. Labor input is low and decreasing; income and the percentage of cattle-derived saleable production are low; the prospects are of extinction.

The *persistent, or stable, full-time* (SFT) group includes farms which have always been full-time. Families are characterized by old age, and farms by low crop intensity and limited investments.

In *professional full-time farms* (PFT) the land is very productive; crop mix is very intensive; labor input is high, auto-consumption is low, a variety of types of investment are practised. Per-capita income is, however, lower than in pluriactive farms, due to the absence of off-farm income and to the larger size of the family.

The results of *pluriactive farms with full-time operator* (PPT) and *dynamic pluriactive farms* (DPT) are comparable: both are highly market-oriented, with average or high degree of land and labor productivity. Where the operator is employed full-time on the farm, labor input is higher, and so are the farmed area, mechanization, gross saleable production, surface increase through renting and investments in land purchase. In pluriactive farms whose operator is employed off the farm, labor productivity is higher, due to a higher use of hired machinery. There seems to be more interest in raising the standard of living

TABLE 1

Synoptic table of typology

Typology	Operator	Family	Farm	Dynamics	Localization
OFT	Old, low education	Old, nuclear, low work intensity	Low productivity, auto-consumption, few cattle, wine and olive, low mechanization, contracting, low investments	Shift from part-time to full-time, decreasing labour input, prospects of cessation	Industrialized hill area
SFT	Old, low education	Old, low per-capita income	Low productivity, auto-consumption, few cattle, olive, low mechanization	Always FT, decreasing labour input, prospects of cessation	Throughout area
PFT	Elderly	Large, multigenerational, low per-capita income, high labor input	High productivity, low auto-consumption, very productive land, intensive cultural mix and cattle, all kinds of investments	Always FT, irregularly increasing labour input, prospects of growth	Not present in industrialized hill area
PPT	Elderly, full-time	Elderly, high per-capita income	High productivity, low auto-consumption, high mechanization	Increase in land, shift from FT to PT, operator always FT, prospects of growth	Industrialized low lying area
DPT	Elderly, educated, previously FT income	Elderly, high per-capita income, high off-farm	High productivity, low auto-consumption, contracting, all kinds of investments, increase in female labor	Shift from FT to PT, prospects of growth	Not present in rural hill area
UPT	Young, changed operator	Young, multigenerational, low per-capita income,	Low productivity, high auto-consumption, contracting	Persistence in PT, prospects of stasis	Rural hill area
SPT	Old, always FT	Elderly, very large, multigenerational	Low productivity, high auto-consumption	Decrease in farm work, prospects of stasis	Rural hill area

FT, full-time; PT, pluriactivity.

(e.g., by higher investments in buildings) and in the full use of the labor resources, than in farm-related goals.

Both groups are composed mostly of nuclear families in the adult stage (children from 15 to 24). Off-farm employment is usually steady, with some self-employment in dynamic pluriactive farm families. The latter usually present a better-educated operator, a higher use of technology and a better organization of production; often, the female labor force replaces the male labor force employed elsewhere. Pluriactive farms with a full-time operator have slightly

TABLE 2

Main features of the family farms ranked in seven types

	OFT	SFT	PFT	PPT	DPT	UPT	SPT	Total
Number of family farms	23.0	21.0	25.0	33.0	23.0	27.0	48.0	200.0
Percent	11.5	10.5	12.5	16.5	11.5	13.5	24.0	100.0
Operator								
Age (years)	66.0	65.7	59.5	54.0	51.3	45.8	63.4	58.1
% of farm work in his total work	0.0	0.0	0.0	0.0	57.3	36.6	11.8	15.7
Persistence in full-time*	60.9	100.0	96.0	87.9	17.4	22.2	81.3	68.5
Change of operator*	8.7	0.0	8.0	15.2	21.7	48.1	14.0	17.0
Family								
Number of members	2.2	2.4	5.4	3.6	3.8	4.9	5.0	4.1
Average age (years)	65.5	61.3	43.1	40.0	42.6	39.0	43.8	46.5
Life cycle stage:								
young family*	0.0	0.0	8.0	3.0	13.0	25.9	0.0	6.5
mature family*	4.3	4.8	32.0	63.7	69.7	55.6	4.2	32.0
child-launching family*	8.7	4.8	60.0	33.3	13.0	3.7	87.5	37.5
old age family*	87.0	90.4	0.0	0.0	4.3	14.8	8.3	24.0
Nuclear family*	95.7	85.7	36.0	81.8	78.3	48.1	22.9	59.0
Persistence in full-time*	17.4	81.0	76.0	0.0	0.0	0.0	0.0	20.0
Persistence in part-time*	0.0	0.0	0.0	9.1	17.4	51.9	33.3	19.0
Shift from full-time to part-time*	0.0	0.0	0.0	75.8	73.9	37.0	58.3	40.5
Shift from part-time to full-time*	43.5	0.0	4.0	0.0	0.0	0.0	0.0	6.0
Degree of pluriactivity	0.0	0.0	0.0	36.5	51.3	39.0	44.4	28.4
Hours worked on farm	1884	3330	6048	3762	2717	3216	3469	3442
Dynamics of farm work:								
increase in farm work*	0.0	14.3	36.0	12.1	4.3	14.8	0.0	10.5
static*	0.0	19.0	12.0	21.2	8.7	18.5	14.6	14.0
decrease*	87.0	61.9	8.0	24.2	43.5	40.7	58.3	46.0
irregular*	13.0	4.8	44.0	42.5	43.5	26.0	27.1	29.5
Increase in female labour*	21.4	28.6	32.0	27.3	52.2	33.3	43.8	35.0
Total income (1000 lire)	7653	6281	12657	15863	16832	14114	17071	13677
Income per family member (1000 lire)	3570	2890	2372	4493	4413	2950	3698	3545
Unsteady off-farm work*	0.0	0.0	0.0	12.1	17.4	55.9	14.6	15.0

Farm								
Agricultural-used area, AUA (ha)	5.10	4.46	6.94	5.75	4.58	3.71	4.12	4.89
AUA per family member (ha)	2.72	2.11	1.44	1.68	1.37	0.84	0.92	1.49
Hours of work per ha AUA	277	867	1030	725	729	940	901	798
Professional farming*	21.7	47.6	100.0	93.9	65.2	85.2	68.8	71.0
Machinery owned (hp per ha AUA)	3.1	4.1	10.5	9.5	7.5	7.8	7.8	7.4
Contracting*	91.3	57.1	28.0	39.4	65.2	66.7	50.0	55.0
Livestock (AVA per ha AUA)	0.2	0.4	2.7	1.4	1.4	0.8	0.7	1.7
Gross marketable product, GMP (1000 lire)	3685	3357	12467	7460	6091	3152	3265	5475
GMP per ha AUA	750	809	1949	1353	1433	857	797	1110
% of GMP for auto-consumption	23.8	20.8	14.7	14.4	16.0	34.2	35.9	24.2
High index of total productivity*	4.3	9.5	56.0	30.3	30.4	14.8	12.5	22.0
Increase in AUA*	0.0	4.8	16.0	30.3	8.7	22.2	18.8	16.0
Increase in AUA per family member*	82.6	52.4	20.0	51.5	39.1	33.3	41.6	45.0
Future prospects								
cessation*	47.8	28.6	4.0	3.0	4.3	3.7	4.2	11.5
static*	21.7	52.4	12.0	15.2	21.7	63.0	60.4	37.5
growth*	30.5	19.0	84.0	81.8	74.0	33.0	35.4	51.0
Context								
Industrialized low-lying area*	4.3	23.8	36.0	51.6	21.7	0.0	10.4	21.0
Industrialized hill area*	56.6	19.0	8.0	15.2	43.5	3.7	0.0	17.5
Rural hill area*	4.3	28.6	32.0	21.1	8.7	59.3	58.3	34.0
Residential touristic mountain area*	34.8	28.6	24.0	12.1	26.1	37.0	31.3	27.5

*% of total farms in any type.

hp, British horsepower = 550 lbf ft $s^{-1} \approx 745.7$ W.

better agricultural prospects, usually because of their larger size and lowland location.

In *unsteady pluriactive family farms* (UPT), off-farm employment is usually in agriculture (as farm-hands) or in construction. This type of farm prevails in internal non-industrialized areas, and is characterized by the scarcity of resources, especially in terms of farm size; therefore, their lives are heavily influenced by the external context. When there are no alternatives to farm-work, their prospect is stability without growth; auto-consumption assures the subsistence of the family.

The *subsistence pluriactive family farms* (SPT) are also mostly located in non-industrialized areas. Here again, auto-consumption is high, and prospects are of stability without growth. The family is usually of the multigeneration type, and age is advanced. There are both full-time members and dual-active members with steady off-farm employment. We may describe those farms as a supplementary resource for families with mostly non-agricultural income.

Table 2 presents the mean of the main continuous variables, and ranks the farms according to the typology and to the main significant categories of nominal variables.

Genesis and dynamics of pluriactivity

Of the several possible forms of shift from full-time to pluriactivity (Gasson, 1986), those concerning the operator are not the most relevant: of the 82 families of our sample which shifted to pluriactivity since 1960, in 27 cases the shift concerned the operator, and in 55 cases other members of the family. The shift to pluriactivity often coincides with succession.

We examined the condition in 1960 of the farms which later became pluriactive, and of those which remained full-time, in order to verify under which aspects these two groups were originally diversified. The most relevant features, from the point of view of the family's future choices, were in order of importance: an early stage of the life cycle; a low ratio of agricultural land to family members; and a high ratio of work hours to agricultural area. Under these conditions, in a dynamic labor market as was the case in the 60s, off-farm employment becomes an obvious solution.

The new employment opportunities offered by industrialization granted steady employment to families newly shifting to pluriactivity, while older pluriactive families were, and still are, characterized by irregular off-farm employment (farm work and building).

Toward an interpretative model

The results obtained so far suggest that the dichotomy between full-time and pluriactive farms does not account for all of reality: a great deal of diversity

exists within both groups. The other variables, which must be considered in a behavioral model based on a typological approach, are:

- the distinction of 'professional' vs.'accessory' farms, as an indicator of non-marginal farm employment;
- the incidence of auto-consumption, as an indicator of the family's and the farm's economic goals;
- the family structure, shown for instance by the life-cycle stage;
- the prevalent type of off-farm employment, as an indicator of the relationship with the labor market.

The last variable is a first synthetic context indicator. Other context variables, concerning the description and interpretation of agriculture, might be introduced: physical characteristics of the territory; services available, in terms of relationships with processing and marketing as well as of the level of technology; and the incidence of contracting, which favors freeing labor for off-farm employment.

Family structure can be seen as a link between push-and-pull factors: the family's pressure on the land interacts with the growth of industry and of the service sector, which allow individuals, compatible with the demographic characteristics of the family and the professional training of its members, to shift to a non-agricultural job.

Pluriactivity, then, may be said to represent an adaptive strategy to changes in internal and external conditions: small farms do have a range of alternatives, but their survival depends on the ability to make the adjustments required by their situation. In this process, choices are limited by natural and structural resources, and available services and conditions of the labor market. The composition and age of the family also influence the decision-making process; but certain personal characteristics also contribute to flexibility or rigidity: beside youth, education, and a favorable economic environment, personal ability also accounts for residual differences. On the other hand, a cultural attachment to traditional rural values, sometimes transcending economic considerations may also play a part in the persistence of farms not economically viable.

Within the family, the operator plays a significant role. His working full-time on the farm may indicate concern for the farm's future; on the other hand, the operator's decision as to whether or not seek outside employment is also related to the stage in the family life-cycle and structure. In young nuclear families, where income needs are higher because the family is just becoming established, one member (generally the operator) usually carries out a double activity. In the mature stage of the life cycle, on the other hand, pluriactivity divides the family into two groups: the second generation, usually, is involved in 'dual activity', while the older members are likely to be employed full-time on the farm. This solution makes for the highest income and the best dynamics.

Families have different goals, and make decisions accordingly, either con-

centrating on exploiting the farm, or attempting to utilize all the range of their resources. These choices influence the organization of production, with more or less contracting for machinery; investments will also be influenced by the primary purpose of the land as either the family residence or a productive factor. Both, however, may have similar productive results.

Therefore, when statistics identify pluriactive and full-time farms by referring only to the operator, they unduly unify quite different types of full-time farms (viable or approaching extinction), and differentiate pluriactive families whose productive results are similar, independent of the operators' status.

The influence of physical resources and of the context is highest in rural mountain areas. Here, the push to pluriactivity is determined by difficult structural conditions, lack of employment opportunities, and the rural environment's resistence to change. Involvement with the farm persists, and younger-generation operators may take over, but the farm is deactivated: contracting prevails, cattle are reduced, auto-consumption still prevails, and prospects of improvement are limited. This shows that the change of operator, though necessary, is not a sufficient condition for the revitalization of the farm, which depends to a large extent on other factors affecting the possibility of structural change.

Dynamic perspectives and policy

In many Italian rural areas — especially in irrigated lowlands — family dynamics and changes in context coincided with structural changes in the farm. In the area under consideration, however, the rigidity of the real estate market, and limited technical advance, embodied only in traditional mechanization, kept land and farm structures virtually unchanged. Productive mix and market relationships also remained relatively stable.

The family farms which underwent a change in operation or ownership were relatively more dynamic. This reinforces the hypothesis that succession may link family dynamics to a better exploitation of internal agricultural resources, mostly when the role of the farm in the family strategy is relevant in terms both of subjective evaluations and of its objective potential.

The question of change in operation and ownership — by inheritance or by access of 'new' farmers — is important because many farms are operated by elderly families. Sooner or later the 'old' farms of today will take on other typological characteristics, which are difficult to foresee because they depend also on agricultural, social, environmental (and tax and inheritance) policies. In some cases, when no successor is immediately available, the land may be left to others for more flexible, or even temporary, forms of operation.

In many productive full-time farms, the operator is elderly and the family relatively young. These are instances of delayed succession, which will evolve with generational change. Current agricultural policies are much concerned

with the very low per-capita income level of these families. An increase in work-derived income may result from improved farm production or a shift to pluriactivity, assimilating these farms to the conditions of vital pluriactive farms.

These latter farm, whose productive results and development prospects are similar to those of full-time farms, ought to receive equal consideration in agricultural policy. The importance of this type of farm is enhanced by the fact that they are found, to a great extent, in productive agricultural areas which have been involved in widespread industrialization.

The problems of family income may not always be solved by pluriactivity: farm size may be inadequate, or only irregular off-farm employment may be available. This is the case in the Sacco river valley, as well as in many other hill and mountain areas, especially in the South. The prospects of these farms could be affected not only by structural agricultural policies, but also by social and economic development policies.

The prospects of subsistence pluriactive farms, instead, are scarcely influenced by economic results or by policy: they are oriented mostly toward autoconsumption and residential use of the land, and are, therefore, likely to persist.

Conclusions

Our analysis has followed a structural approach, using variables concerning the family, the farm and the context jointly in static and dynamic terms through a multidimensional methodology. We were thus able to define a typology of farms and households, and to highlight the elements (mainly push factors) related to the shift to pluriactivity.

This approach, common to much recent Italian research, is more rewarding than a dichotomous one which, based only on the presence or absence of off-farm jobs, cannot show the multiplicity of situations and types of behavior found both in full-time farming and pluriactivity. This plurality may be explained not only by this opposition, but also by the distinction between professional and accessorial farming, by the families' economic goals and the role of the farm within them, by the structure of the family, and by the characteristics of non-farm employment. Any model of pluriactive farming should consider the family in terms both of demographic features (especially the life-cycle stage) and of strategies, the maximization of farming profit being only one of several possible goals.

Our attempt to draw, from a typology based on the results of an empirical survey, some elements of an explanatory model of the behavior of farm families has shown that objective and subjective data must be used jointly, in a dynamic fashion. We believe, however, that much could be gained by taking dynamics into consideration not only in the analysis but even earlier at the stage of the collection of data.

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