

WORKING PAPER SERIES NO. 6

The Nature of the Diversified Farm Household

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Tänikon, January 2009



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ABSTRACT

This paper presents a theoretical approach that explains farm household diversification decisions by the relative attractiveness of both food production and family businesses. The empirical analysis of diversified activities of Swiss farm households shows that a low household income leads to diversification by off-farm activities, while a high income leads to diversification by on-farm activities. It is also shown that arable farms, mountain farms and farm households with a non-agricultural education are more likely to enter off-farm activities.

1. INTRODUCTION

We have known since 1857 from Engel's law that, in the process of economic growth, the relative importance of primary food production is shrinking. This has led to an unsteady yet continuous downward spiral of the agricultural sector's relative importance (Kilkenny and Otto, 1994; Timmer, 1998) and a large number of cases in which potential farm successors choose an occupation outside of the agricultural sector (Guither, 1963; Potter and Lobley, 1992; Taylor et al., 1998; Zhao, 1999; Mann, 2008). However, 'failed succession' is not the only possible reaction to the declining role of the primary sector. Both during the active phase of a farmer and when succession becomes relevant for the farm household, diversification may also be an option to react to the sector's shrinking importance and turn towards the processing or the service sector.

Another important dimension of household diversification is the institutional aspect. Most people in modern societies spend most of their time in two different entities: one is the firm, which since Coase (1937) is well known as a network structured by hierarchy, and the other is the family, which Wallerstein et al. (1982) describe as an income pooling unit. Some other people, however, choose to link these two entities, becoming active in some sort of family business (Stame, 2000; McGibbon, 2001). The specific characteristics of this organizational form, particularly the crucial role of trust and distrust, have been explored by Schulze et al. (2002), Wheelock et al. (2003) and Steier (2005). Arguably, the most traditional and the most frequent sort of family business is the family farm. The question why people would choose

the institution of family business or not is probably most easily answered if one analyses the interface between family farms and transmissions to other institutional forms.

Taking these two aspects together, the nature of family farms is challenged by different strategies: one is internal diversification, where the nature of the family business as such remains untouched, but where the activities within the business are redefined. The other strategy is the partial break away from the family business through so-called part-time farming. This strategy of personally leaving the farm for external subordination to a firm is also called diversification by some scholars (e.g. Niehof, 2004).

This paper aims to improve the basic understanding of the phenomenon of farm diversification strategies. In the attempt to explain diversification processes on farms, a theoretical framework is developed in Section 2. Hypotheses on farm household diversification in Switzerland resulting from this framework are presented in Section 3. The method to test the hypotheses is introduced in Section 4. Results are presented in Section 5 and discussed in Section 6.

2. THEORETICAL FRAMEWORK

Many agricultural economists and sociologists have understood the huge importance of the concept of path dependency for the comprehension of agricultural structures (Beckmann and Hagedorn, 1995; Balmann, 1997). More often than not, the existence of a family farm is not so much the result of a choice between different organizational forms, but a given fact which the farm family may want to change. Every change, however, incurs considerable transaction costs, including the effort to obtain information, to fulfil legal requirements and to adapt to the new circumstances.

Figure 1 gives an overview of the driving forces of diversification and conversion activities of the farm household. If the starting point is the farm household, the institutional form of a full-time family farm will prevail if the attractiveness of the family business and of food production is perceived as high, although the household members may decide to enlarge the farm business within the limits capable for a family. However, both a low attractiveness of the family business as such and a low attractiveness of food production may give rise to changes. The concept of attractiveness should be understood in a holistic way and not reduced to the aspect of income. A large number of studies (Bahner, 1995; Koch-Achelpöhler, 1998; Lips and Gazzarin, 2008) has shown that non-monetary aspects play a large role in allocation decisions around the agricultural household.

If the attractiveness of being part of a family business is low, some family farms may give up, whereas others may enlarge and convert to corporate farms, i.e. large-scale farming as defined by Allen and Sachs (1992). It has to be emphasized, however, that most agricultural systems relying on corporate farms have been introduced by political force, namely by some kind of socialist land reform. Although corporate agriculture has shown a high degree of competitiveness, path dependency has obviously prevented a spontaneous, bottom-up large-scale transformation of family farm systems. One of the few examples where it appears that the market itself decided in favour of corporate agriculture is the United States, where corporate agriculture was able to gain some ground without major political support (Beinart and Coates, 1995).

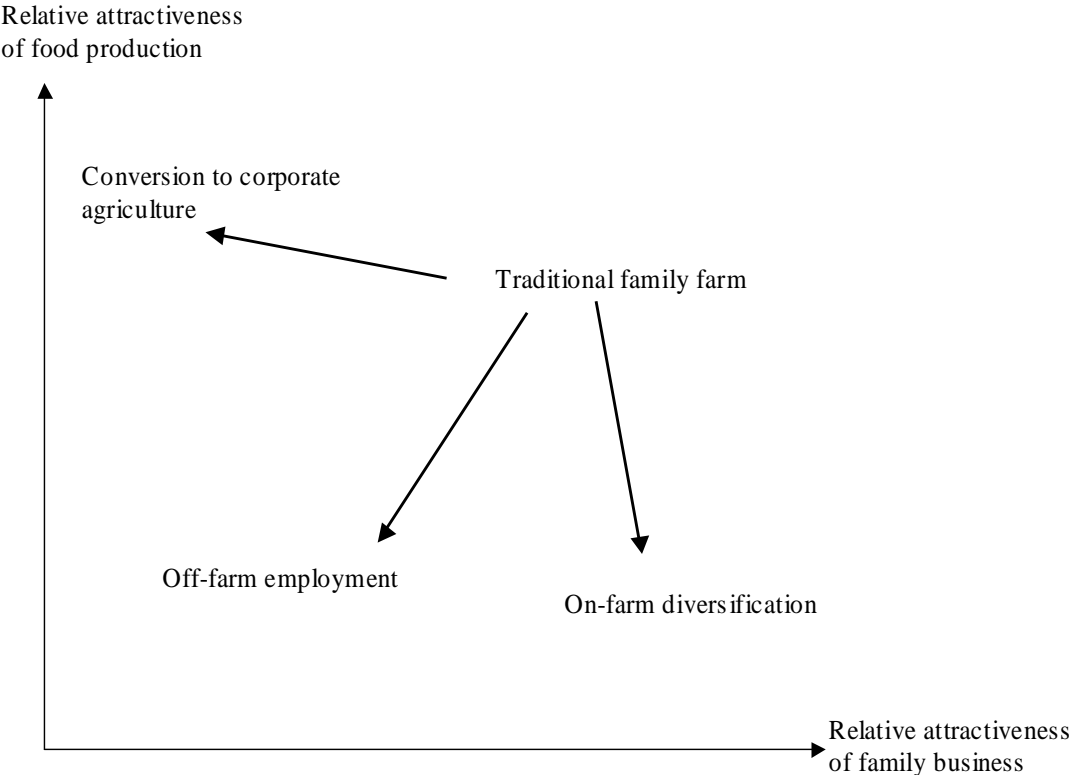


Figure 1: Institutional options from traditional family farming

The shrinking attractiveness of food production alone, on the other hand, would not lead to a challenge to the family farm as a production unit. If the attractiveness of the unity between farm and household remains high, the switch to the provision of non-food goods and services will be carried out within the farm household. Admittedly, this is only one aspect of the choice between on-farm or off-farm diversification. But while the complementarity of non-food activities with food production plays an important role (Windle and Rolfe, 2005), a farm family

would hardly enter additional on-farm activities if it feels that their labour would generate more utility (both monetary and non-monetary) outside their household.

If the members of a farm household feel the shrinking attractiveness of both food production and a family business, they will increasingly enter off-farm activities. The switch to paid employment is a strategy which should be seen as an important type of household diversification, albeit not as farm diversification.

3. HYPOTHESES

It is obvious that not only the market environment, but also the scope and scale of the farm household will have a strong influence on both the relative attractiveness of food production and the relative attractiveness of the family business. In fact, there is a considerable amount of literature that reveals both motivations for on-farm diversification and for off-farm labour which contribute to a thorough understanding of the empirical side of farm household diversification.

Household income, for example, plays a potentially important role, as income is one of the core components for making labour attractive (Rosen, 1986). While the empirical correlation between off-farm income and household income is uncertain (Lass and Gempesaw, 1992), off-farm work is traditionally seen as the effect of an insufficient farm income (Britnell, 1951) or high debts (Bowler et al., 1996). Schmitt (1989) has intensely argued that off-farm work would be a reasonable strategy to maximize household income, whereas Swiss figures for the low agricultural productivity of small part-time farms are less optimistic (Mann and Latruffe, 2008). For on-farm diversification, it is well known that there is a positive correlation between such activities and household income. Opinions are split, however, whether it is the non-farm-related business which increases incomes (Rønning and Kolvereid, 2006), or whether farms with a better resource endowment are more prone to diversification activities (Ilbery, 1991; McInerney and Turner, 1991; Ilbery and Bowler, 1993).

It becomes clear that the causality between income and household diversification deserves a closer empirical look. On the theoretical side, however, the confusing complexity of this interplay might become clearer through the framework drawn in Section 2. If the constellation within the farm family suits the maintenance of a family enterprise, it is not only reasonable to assume that this enterprise will diversify within the limits of the farm; it is also likely that this farm business will be economically successful. Likewise, if the structure within the farm family leads to misunderstandings, conflicts or other hazards for the successful management of a family business, it is not only likely that diversification will take place outside the farm, but also that the agricultural enterprise will not earn a very large income. This leads to the

first hypothesis that a high farm household income will tend to lead to on-farm diversification, whereas a low farm household income will lead to off-farm diversification.

Education is another important influencing variable. Past research has confirmed that a high level of education correlates both with on-farm (Ilbery and Bowler, 1993) and off-farm (Zhang et al., 2008) diversification. However, little attention has been paid to the quality of the education. It is likely that investing in an education outside agriculture will increase both the likelihood of entering off-farm employment and on-farm diversification. It is less likely that an agricultural education will encourage farmers to diversify outside food production. Therefore, the second hypothesis is that only non-agricultural education will positively influence the farmer's decision to diversify. This mechanism will apply not only to the farmer, but also to his partner.

The distribution of workloads on the farm depends heavily on the nature of the farm business. For animal production, labour requirements are spread much more evenly through the year than for crop production, where summer time is much busier than winter time. Empirical evidence has it that both on-farm diversification (Ilbery et al., 1997) and off-farm employment (Sumner, 1982) take place predominantly on crop farms which manage to utilize spare labour resources during the winter months. For the Swiss situation, where winter sports and winter tourism play a significant role as a second income for farm families in the mountain area, the third hypothesis can be drawn that the diversification of crop farms, at least off the farm, will exceed that of other farms. No clear prediction can be made for on-farm diversification, because some sorts of on-farm diversification, such as farm tourism and landscape maintenance, gain added value from the presence of animals.

Another important issue is the structure of the farm family, about which McNally (2001) reports rather mixed evidence. In general, it is plausible that a rather heterogeneous household structure will be a good basis for diversification, just because it is unlikely that, in a heterogeneous group, everybody has an advantage in agriculture. In addition, a high degree of heterogeneity may also increase the transaction costs of running a family business. As one rough indicator for household heterogeneity may be the age difference between the farming couple, our fourth hypothesis is that the age difference between the farming couple will positively influence the tendency to enter off-farm employment. For other indicators for farm household heterogeneity, no data is available.

4. METHOD

Switzerland is an appropriate country to test the hypothesis developed in the previous Section, because it is almost completely characterized by family farms. In addition, unemployment in Switzerland is constantly below five per cent, so that off-farm employment is a realistic option. Likewise, several possibilities for on-farm diversification are available, many of them well established. It was chosen to use data from the Farm Accountancy Data Network (FADN) because this gives detailed information about the financial relevance of diversification activities. The most recent period available (2006) was chosen to test the hypotheses. The few farms in Switzerland which are not family farms were excluded from the sample.

The data question leads to the first issue: how to put diversification activities into an operational form. While FADN data also make it possible to distinguish revenues from renting stables or vinification for other farmers, we consider only revenues that have no direct connection with agricultural production, such as tourism, landscape maintenance or marketing activities. The data also allow us to take a closer look at the importance of these activities. Thus, on-farm diversification can be measured by revenues from outside agriculture as a share of total farm revenues. This variable will be biased if the cost level is different between different on-farm activities. However, the share of revenues from on-farm diversification appears to be the least evil of existing possibilities. Off-farm diversification can be taken as the off-farm income share of total household income.

In order to test the first hypothesis concerning the connection between income and diversification, two methodological challenges arise. One is that the causality between income and diversification has to be checked. We do that by introducing time lags, trying to explain both actual farm income by diversification activities three years ago and diversification activities by the farm income three years ago. This means that we have to exclude farms from the sample which did not deliver their data in both years. The other question is how to measure farm income. Should we rely on per-hour real income or should we instead put our focus on the total agricultural income? The work by Lauber (2006) shows that for the traditional full-time farm (at which we are looking), the decisive variable is the total agricultural income rather than per-hour rates (which become more important for part-time farms).

Concerning education, the Swiss FADN database records for each farmer and for every member of the family which type of education has been achieved. This information can be transformed into four explaining variables, which are useful for testing the second

hypothesis. The age differential between the farming couple is just measured by a single variable in order to test the fourth hypothesis. Again, this makes it necessary to exclude the data for farms where the farmer does not have a spouse.

While the FADN system covers 12 different farm types, we restrict ourselves to the distinction between crop farms (both arable farms and fruit and vegetable growers) and other farms. This variable is used to test our third hypothesis.

Some other variables, regional factors in particular, need to be included in the regressions in order to avoid possible deteriorations. The different parts of the country may, for cultural reasons for example, have different patterns for diversification activities. In addition, for Switzerland, the position in the mountains, the hilly region or in the valley are very decisive for the character and the environment of the farm and may also influence diversification decisions. Likewise, organic farms may have a different approach towards diversification activities and should be distinguished in the analysis.

Taken together, the following regressions (variables based on Table 1) have to be calculated in order to test the hypotheses developed in the previous Section:

- (1) $\text{Parashare} = F(\text{Income}_{t-1}, \text{Region}, \text{Crop}, \text{Organic}, \text{Agefarmer}, \text{Agediff}, \text{Nonag-Edu-Farmer}, \text{Nonag-Edu-Partner}, \text{North}, \text{East}, \text{South}, \text{West}, \text{Central})$
- (2) $\text{Offshare} = F(\text{Income}_{t-1}, \text{Region}, \text{Crop}, \text{Organic}, \text{Agefarmer}, \text{Agediff}, \text{Nonag-Edu-Farmer}, \text{Nonag-Edu-Partner}, \text{North}, \text{East}, \text{South}, \text{West}, \text{Central})$
- (3) $\text{Income} = F(\text{Parashare}, \text{Offshare}, \text{Region}, \text{Crop}, \text{Organic}, \text{Agefarmer}, \text{Agediff}, \text{Nonag-Edu-Farmer}, \text{Nonag-Edu-Partner}, \text{Children}, \text{Adults}, \text{Land Area}, \text{Animals}, \text{North}, \text{East}, \text{South}, \text{West}, \text{Central})$

where the character, range and average of the variables is described in Table 1.

Table 1: Used variables

	Explanation	Scale	Minimum	Maximum	Mean
Parashare	Share of farm income from non-agricultural activities	percentage	-4739 ¹	1365	17.5
Offshare	Share of household income from off-farm labour	percentage	-1419	871	26.9
Income	Annual household income	Francs	-140 844	316 736	76 888
Nonag-Edu-farmer	Farmer's non- agricultural education	1-none, 2-currently in education 3-finished basic education 4-finished higher training; 5-graduated at university	1	5	1.11
Nonag-Edu-partner	Partner's non-agricultural education	As Nonag-Edu-Farmer	1	5	2.16
Arable	Arable farming	0/1	0	1	0.0553
Agefarmer	Age of the head of the farm	years	25	72	46.9
Agediff	Difference (absolute value) between farmer's age and partner's age	years	0	41	3.81
Region	Topographical position	1-valley zone, 2-hill zone, 3-mountain zone	1	3	1.82
Organic	Organic farm	0/1	0	1	0.149
Children	Persons 16 years and younger on farm	number	0	11	1.26
Adults	Persons 17 years and older on farm	number	1	10	3.04
Land Area	Size of farm	hectares	2.23	67.7	20.0
Animals	Size of animal holding	Livestock units	0	166.9	27.5
North/ East/ South/ West/ Central	Regions of Switzerland (Reference: Midland)	1/0			

The regression was carried out by Ordinary Least Squares analysis. In order to avoid a bias of the analysis, White's test for heteroscedasticity was carried out with a negative result. No autocorrelation could be detected.

¹ Negative numbers and numbers above 100 per cent result from the fact that a negative income is possible for both farm and off-farm activities.

5. RESULTS

Table 2 depicts the results of the first two regressions shown in the previous Section. It shows that the first hypothesis developed in Section 1 cannot be rejected. The impact of the farm income on on-farm diversification activities is positive, as a successful institutional design tends to copy itself for non-food purposes. On the other hand, farms with a low income tend to leave the institutional form of the family business and work off-farm. The causal relation is rather clear, as is revealed by the results depicted in Table 3 where both kinds of interdependencies show the opposite signs: a high share of activities outside the traditional farming sector certainly does not affect farm household incomes positively, while off-farm activities significantly do. In other words: farm households that are badly off tend to choose off-farm work which improves their financial situation considerably. On the other hand, farms that invest in bed & breakfast or other on-farm diversification activities are usually well run, but investments in these activities do not seem to increase their household income.

While the first hypothesis cannot be rejected, the second hypothesis seems only to be true for off-farm work. Both the farmer's and the spouse's education outside agriculture apparently contribute to the willingness to enter occupations in other companies (and the possibility of doing so). No strong relation, however, could be found between the farming couple's non-agricultural education and on-farm activities outside agriculture. It appears that what really counts is more a formal degree that opens doors at potential employers, not the knowledge gained from education itself. While the farmer's agricultural and non-agricultural education did not show a significant effect on household income, the farmer's spouse's non-agricultural income did.

The third hypothesis clearly cannot be rejected. Arable farms, probably due to their uneven workload distribution, are more likely to enter both on-farm and off-farm activities outside food production. In addition, arable farms earn a higher income than other farms.

The fourth hypothesis has to be rejected, at least in respect to the operationalization chosen. The difference in age between the farming couple is not a good predictor for diversification activities. Maybe, the operationalized concept of partnership has been too limited by the exclusion of, for example, father-son partnerships. Also, the likeliness of diversification does not change with the farmer's age, while older farmers earn less than younger farmers.

Some other factors not explicitly included in the hypotheses also played a role. Farming households in the mountains earn less and are more likely to diversify, particularly off-farm, than farms in the lowlands. And organic farms earn a higher income than other farms, being

more likely to offer non-agricultural activities on their farm. However, on-farm diversification largely seems to depend on soft factors, as the measure of determination is remarkably low.

Table 2: Explanation of diversification activities

	OFFSHARE (n=1743)	PARASHARE (n=1743)
Income _{t-1}	-0.00005* (2.06)	0.0001* (2.50)
Nonag-Edu-farmer	3.07* (2.01)	4.06 (1.57)
Nonag-Edu-partner	3.18** (3.65)	-2.05 (-1.33)
Arable	7.54* (1.97)	43.1** (6.33)
Agefarmer	-0.167 (-1.50)	-0.21 (-1.04)
Agediff	-0.361 (-1.46)	0.28 (0.64)
Region	6.34** (5.58)	3.61† (2.11)
Organic	-0.134 (-0.05)	9.01* (2.03)
North	6.23* (2.13)	11.0* (2.11)
East	-0.267 (-0.12)	-1.45 (-0.35)
South	398.2** (16.17)	24.8 (0.57)
West	-1.67 (-0.19)	-22.2 (-1.42)
Central	4.86* (2.22)	-1.34 (-0.35)
R²	0.17	0.04

† p≤10 %; * p≤5 %; **p≤1 %

Table 3: Explanation of household income

	INCOME (n=1747)
Parashare _{t-1}	-2.59 (-0.23)
Offshare _{t-1}	56.4* (2.19)
Nonag-Edu-partner	1690* (2.13)
Arable	12141** (3.23)
Agefarmer	-238* (-1.99)
Region	-7167** (-6.74)
Organic	8636** (4.08)
Children	2123** (3.25)
Adults	2230** (3.58)
Land Area	753** (7.25)
Animals	306** (5.58)
North	464 (0.17)
East	10901** (5.21)
South	-45331* (-2.01)
West	-8696 (-1.06)
Central	-2313 (-1.13)
R²	0.19

† p≤10 %; * p≤5 %; **p≤1 %

6. CONCLUSIONS

Farm household diversification is an institutional option the attractiveness of which depends on two important factors. One of them is the relative attractiveness of food production. As it shrinks, non-agricultural activities on the farm such as tourism or direct marketing may become increasingly an option. The other is the relative attractiveness of the family business. If this is not prevalent any more, exit from agriculture or the change towards corporate farming may be the best move. And if the two developments occur simultaneously, off-farm work should be the option to consider.

Many factors play into this decision, as the empirical part of this study has shown. A formal, non-agricultural education, for example, increases the potential wage rate for the members of the agricultural household and therefore the opportunity costs of farming. Likewise, animals on the farm hamper the potential for a flexible off-farm occupation. And also the job potential in the different Swiss regions determines the possibilities of part-time farming.

Over the history of agricultural policy discussion, several scholars have strongly defended the superiority of family farming for reasons of transaction costs (Tchajanov, 1930; Schmitt, 1991; Beckmann, 2000). The empirical part of our study suggests that there is no such thing as *the* family farm. It is well known in family sociology (White and Klein, 2002) that some families work much more smoothly than others, and the same has to be said about family businesses. Some of them may eventually have prohibitively high transaction costs that will result in a low household income. For such households, any move away from family farming may be the most reasonable solution.

Future research may focus on other branches of the economy like retailing or bakers where family businesses also compete with companies outside the family structure. It would be interesting to find out both parallels and differences to the farming sector in the determinants of the competition between the two institutional forms.

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