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OCCUPATIONAL CHOICE AND STRUCTURAL CHANGE

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Occupational Choice and Structural Change

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ABSTRACT

The connection between average sectoral income, occupational choice and structural change has so far only been described vaguely for sectors dominated by small enterprises. Taking agriculture as an example, we first develop a theoretical model in which we explain the decision to take over a farm with the average agricultural household income in the past years and the number of farms with the patterns of occupational choice. We then estimate a regression in which we explain occupational choices by the sectoral income situation and rate of farm decline by earlier occupational choices. The results demonstrate that a good income situation increases the number of occupational choices in favour for farming, and that occupational choices for farming in turn slow down the decline in farm numbers.

1. INTRODUCTION

More and more attention of agricultural economists has been devoted to the decline in numbers of farms in the western hemisphere, an important part of what is called structural change in agriculture. The analytical approaches to structural change can be divided into empirical studies in which the patterns of farm decline were traced back to different independent variables and papers that tried to develop a theoretical understanding of structural change.

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Among the latter group, two theoretical approaches have found particular attention among agricultural economists. Schmitt (1991) argues that family farms as a form of organisation have persisted in advanced societies because they allow for a flexible combination of on-farm and off-farm earnings (as recently confirmed by Lee, 1998, and by Ahituv and Kimhi, 2002). He emphasises the importance of transaction costs which, as he recognises, increase with growing farm size. Balmann (1997), on the other hand, dismisses the idea of the structure of small family farms being efficient and states path dependencies and sunk costs as a reason that efficient farm structures could not develop in the western world.

As conflicting as these two theories are (Beckmann et al., 1994), they both neglect the fact that, for every generation, the persistence of each farm is inextricably connected with the decision of an individual to become a farmer. This paper makes the point that, in order to understand the patterns of structural change, one has to understand the patterns of occupational choice.

The connection between occupational choice and structural change in agriculture has been described in some form or other (Gale, 1993; 2003; Fasterding, 2002), but the character and the scale of this connection has never been elaborated on in detail. Furthermore, outside of agriculture the connection between occupational choice and structural change is only partly understood. Rather, the causal relationship is usually perceived to be inverse. Structural change is mostly seen as the independent variable that influences the labour market and eventually occupational choices (Champlin, 1995; Greenhalgh and Gregory, 2001; Sabirianova, 2002). Only gradually is it understood that, in turn, the pattern of occupational choices in a society influences also the economic structure (Nahuis and Smulders, 2002).

Section 2 is devoted to current empirical findings on the determinants of structural change. A model is then developed in Section 3 in order to visualise the dependencies between occupational choice and structural change in agriculture. In Section 4, the model is tested for its empirical relevance, by own results as well as by other research work. Section 5 discusses the implications of the findings for policy.

2. EMPIRICAL LITERATURE ON STRUCTURAL CHANGE

The last decade has seen vast progress in the quality of understanding structural change in agriculture. Primarily, this progress can be attributed to a series of regressions that explain the change in the number of farms by different means. These models which are summarised in Table 1, can be divided into three groups:

Weiss (1999), Baur (1999) and Hofer (2002) look at single farms and carry out logit-analyses in order to determine factors responsible for farm survival and farm abandonment. They are best able to capture the significance of personal characteristics such as the farmer's age and education.

A second group of economists chooses a meso-level, explaining the development of number of farms within a community (Rösti, 1997), a state (Huffman and Evanson, 2001) or a group of farms with similar size and location (Mann, 2003). By doing so, they link the influence of individual factors to the significance of the macro-environment.

Hofreither and Weiss (1993) as well as Schmitt and Andermann (1996 a,b) are primarily concerned with the macroeconomic factors influencing the development of farm numbers and size, by using the number of farms in a country as the dependent variable.

Table 1: Variables influencing structural change in agriculture

	Farmer's Age	Farm Size	Part-time farming	Direct Payments	Product Prices	Labour costs
Weiss (1999)	√	√	√	n.a.	n.a.	n.a.
Baur (1999)	√	√	√	n.a.	n.a.	n.a.
Hofer (2002)	√	√	√	√	n.a.	n.a.
Rösti (1997)	n.a.	√	n.a.	√	-	n.a.
Huffman and Evanson (2001)	n.a.	n.a.	√	√	√	√
Mann (2003)	√	√	n.a.	√	-	-
Hofreither and Weiss (1993)	n.a.	n.a.	n.a.	n.a.	n.a.	√
Schmitt and Andermann (1996a)	√	n.a.	n.a.	n.a.	n.a.	√
Schmitt and Andermann (1996b)	√	n.a.	n.a.	n.a.	√	n.a.

√ influence significant on a 95 % level
- Significant influence could not be proven
n.a. factor was not tested

If Table 1 shows that some factors have been proven as significant by some of the authors and as non-significant by others, this is no grave contradiction but can be attributed to the different time frames and locations of the studies. Overall, however, the studies reveal a coherent picture. Most factors that are shown to influence structural change can well be explained by economic theory and show that rational factors are at least partly responsible

for structural change. To start with the macroeconomic argument, higher costs for factors like labour *ceteris paribus* diminish farm profitability and drive a larger share of farms out of business. On the other hand, agricultural policy measures that keep food prices up and transfer direct payments to farm households tend to conserve the farm structure. In addition, Schmitt and Andermann (1996a) prove the significant influence of the terms of trade as a whole for structural change. The way out of farming seems to be easier for part-time than for full-time farmers. And the Table shows clearly that the economies of scale lead to the well-known fact that large farms are more likely to persist than small farms.

All authors who included the age variable found that the farmer's age was highly significant in influencing the likelihood of a farm to persist. This leads to the assumption that a farm will most probably be given up after the farmer approaches retirement age. It may sound trivial, but the notion that on the other hand closing a farm with the farmer aged, say, 40 years is quite unlikely, has not been given sufficient attention in the debate on structural development.

Our assumption of a farm rarely being abandoned during the work life of the farmer is confirmed by evidence from studies about farm transfer. Normative studies on the optimal timing of farm transfer mainly show a strong dependency from soft factors like the children's respect or the degree of altruism (Kimhi, 1994; Miljkovic, 2000). The empirical literature is more conclusive: Stiglbauer and Weiss (1999) analyse the family farm life cycle and find that the share of Upper Austrian farmers abandoning their farm during the phase of activity is below ten per cent. In a study on farm succession in Switzerland (Burnier et al., 1980), the median age of retiring farmers lies at 59 years, the median age of entering farmers at 31 years. And in a study of abandoned farms in Germany (Strohm, 1998), only two out of 38 full-time farmers that went out of business were younger than 53 years. And Potter and Lobley (1996) show that in the years before retirement, the behaviour of the farmer largely depends on the existence of a successor.

This means that the point of intra-family or even inter-family succession is a critical one for structural change and it is worthwhile to take a closer look at what are the decision patterns for or against taking over a farm. A limited number of studies on farm succession point to the importance of personal preferences (Koch-Achelpöhler, 1998), but also to rational behaviour: Kimhi and Nachlieli (2001) and Fasterding (1999) show by surveys that large and profitable farms are more likely to find a successor than small farms. And Pietola et al. (2003) show the significance of policy support in the decision of potential successors to enter farming.

In the following section, these findings are developed from a mere description into a theoretical model of structural change for family-farm based agricultural systems.

3. THE MODEL

3.1 Occupational choice

Let us first focus on determinants of the personal decision to take over a farm. In line with the model of Rosen (1986), we assume two kinds of jobs to chose between.

$$u_{ia}=w_{ia}+n_i \quad (1)$$

$$u_{ib}=w_{ib}+n_{ib} \quad (2)$$

The agricultural job (set equal with taking over a farm) a and the non-agricultural job b; both have two utility components, a monetary welfare measure w that mirrors the amount of money as earned income and a non-monetary utility component n. The non-monetary utility components of farming have been described extensively (Bahner, 1995). Stating the reason for becoming a farmer, in most surveys autonomy comes first, followed by a preference for working with nature and animals (Bundesamt für Landwirtschaft, 2001). The non-monetary benefits of non-agricultural occupations will differ from case to case. In the public service of most countries, for example, job security will play a role.

It is reasonable, as Gale (1993) does, to assume that potential farm successors are only a finite number of people M. For this model, M may , for example, be assumed to consist of farmers' children. The fact that this is the most common group to choose a farm career is explained by Rosenzweig and Wolpin (1985) for the farm sector and by Bjuggren and Sund (2002) in general. A broader definition of M would include every school graduate who would prefer to work outdoors, as 14 per cent of German school graduates claimed in a survey (Kanowski, 2002).

The decisive factors in M's occupational choice are now the differentials, rather in expected wage w_{ie} than in real wage between agricultural (a) and non-agricultural (b) occupations

$$\Delta w_{ie}= w_{iae} - w_{ibe} \quad (3)$$

and in expected non-monetary utility components

$$\Delta n_{ie}= n_{iae} - n_{ibe}, \quad (4)$$

so that it is possible to work out the expected difference in utility Δu_{ie} between the two occupational choices

$$\Delta u_{ie}= \Delta w_{ie} + \Delta n_{ie} \quad (5)$$

as a result.

Graduates will only choose to enter farming (D=1) if that is what maximises their expected utility. Otherwise, they will choose the non-agricultural occupation D=0. Consequently, choices are wholly covered by the rule:

Choose D=1 or D=0 as $\Delta u_{ie} \gtrless 0$

Ties ($\Delta u_{ie}=0$) are broken by random device, such as flipping a coin.

Given the size of M choosing between D=1 and D=0, relative market supply conditions are completely characterised by calculating the number for whom $\Delta u_{ie}>0$ and calculating the number for whom $\Delta u_{ie}<0$. It is convenient to describe differences in preferences among M parametrically for analysis. Define $g(\Delta u_{ie})$ as the density (in the sense of a probability density function) of expectations in the population of M making choices and define $G(u_{ie})$ as the cumulated density. Then, the fraction of M who choose D=1 must be

$$M_1^s=\int_0^{\infty} g(\Delta u_{ie})du=1-G(0) \qquad (6)$$

The remaining fraction of M chooses not to enter farming. These are persons for whom $\Delta u_{ie}<0$, so

$$M_0^s=\int_{-\infty}^{0} g(\Delta u_{ie})du=G(0) \qquad (7)$$

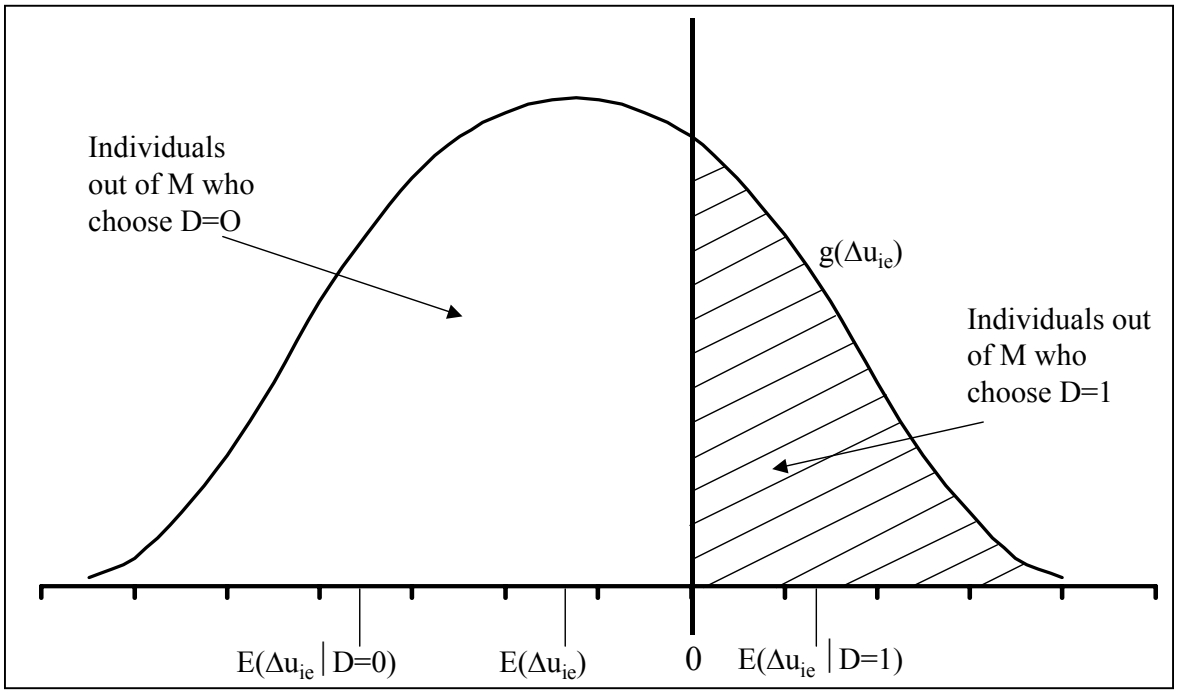
Fig. 1 illustrates eqs. (6) and (7) for a given distribution of Δu_{ie}. Relative supply to D=1 farm successors is the area under $g(\Delta u_{ie})$ to the right of 0 – this is eq. (6). Relative supply to D=0 is the area to the left of 0 – this is eq. (7). E shows the conditional expectations for the whole group of M as well as for M_0^s and M_1^s.

Finally, the share s of M that engages in farming is defined as

$$s=M_1^s/M. \qquad (8)$$

Our theoretical considerations in this model lead to the first hypothesis that the expected difference in utility between an agricultural career and a non-agricultural career influences the decision between farm succession and an alternative career.

Fig. 1: Rational expectations and occupational choice



2.2 Structural change

In order to draw clear conclusions from the patterns of occupational choices to the patterns of structural change, it is convenient to come up with two additional simplifying assumptions. The first assumption is that the period of being the farmer in charge on a farm is given as t years and does not vary over time. t is assumed to be identical for all farmers. The second assumption is that no exit of the farm household is possible before year t once the decision to take-over (D=1) has been made. Both assumptions do largely match the empirical results for family farming, particularly full-time family farms, that will be presented in Section 4. The second assumption can theoretically be explained by the prohibitive level of sunk costs because of investments in education and experience that cannot be regained when leaving the farm (Hirshman, 1970; Sutton, 1992).

From here, the number of farms in a given area can be estimated as

$$F=\sum_{j=1}^{t} (s_j{*}M_j), \qquad (9)$$

in which j=1 describes the past year, j=t the year after which farmers are going to retire. The rate of structural change in agriculture is on the whole primarily described by the annual rate of variation in farm numbers $\Delta F/F$. This rate can be quantified as

$$\Delta F/F=(s_0*M_0 - s_t*M_t)/\sum_{j=1}^{t} sj * Mj\ , \qquad (10)$$

whereas j=0 describes the current year.

That leaves two causes for structural change. The first is that $M_0 \neq M_t$, i.e. that the number of persons eligible for taking over a farm has changed over the years. Consider farm successors as constituting M. A past decline in the number of farms then decreases M_0 compared to M_t. That makes structural change a self-accelerating process. For a broader definition of M, the demographic decline in the birth rate that was experienced in most of the industrialised world led to $M_0<M_t$. Structural change in agriculture should therefore be considered in the context of past sociodemographic trends.

The second constituting component for structural change is the size of s. It is therefore worthwhile to specify eq. (10) by inserting eqs. (8) and (6).

$$\Delta F/F= (\int_0^{\infty} g(\Delta u_{ie0})du/\int_0^{\infty} g(\Delta u_{iet})du)/ \sum_{j=1}^{t} sj * Mj \qquad (11)$$

For the current situation, the distribution of the once expected utility of retiring farmers may be assumed as given. t is also assumed as a constant. Fig. 2 therefore illustrates the rate of structural change as a function of $E(\Delta u_{ie})$ in year j=0. It shows how rational expectations connected with an agricultural career, weighed against rational expectations connected with a non-agricultural career, influence structural change. To give an extreme example: Imagine that the expected utility of farming in the current year is so low that nobody enters farming. Under the assumptions of the model, the maximum rate of farm decline would be restricted to

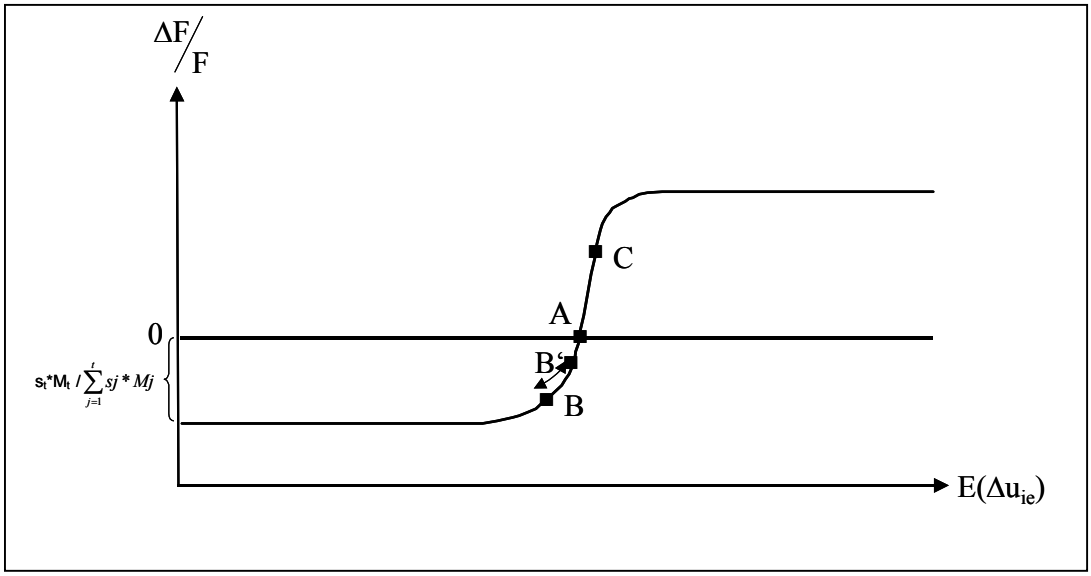
$$\Delta F/F_{min}=- s_t*M_t\ / \sum_{j=1}^{t} sj * Mj \qquad (12)$$

Equation 12 may be visualised with help of figures. Given that farmers have a period of being in charge at a farm for t=30 years, and given that, in past years, the exits from and entrants in farming have been constant from year to year, the maximum decline in farm numbers in the current year would be 3.3 per cent.

Point A at Fig. 2 depicts a situation in which $s_0*M_0=s_t*M_t$, where the number of entries equals the number of exits t years ago, so that the annual rate of structural change is zero. Point B mirrors a situation that is more typical for western societies. The expected utility of taking over a farm is low, thus not all farms do find an successor. This leads to a decline in the number of farms. Point C shows the opposite situation that is typical for some developing countries (Sattar Mandal, 2000) and for many periods in medieval times (Abel, 1962). The

expected opportunity costs of farming are so low that the number of entrants exceeds the number of exiting farmers, therefore the number of farms increases and the size of the average holding decreases.

Fig. 2: Rational Expectations and structural change



As was described in the last section and can be confirmed by browsing through general occupational choice literature (Easterlin, 1995; Clemens, 2002), it is widely held that exogenous changes influence occupational choices. The impact of economic changes on structural change can therefore be seen as an indirect connection. Figure 2 shows a situation in which agricultural policy conditions change in a favourable way, be it through introduction of direct payments or through an administered increase in food prices. This increases the mean of Δu_{ie}, so that B is shifted towards B'. However, an increase in opportunity costs, for example through an increase in non-agricultural wages or a reduction of unemployment, may again decrease Δu_{ie} and shift the equilibrium back to B. Thus, the speed of negative structural change increases again, as fewer graduates choose a farming career.

It depends on the stability of the amount of farmland in a country whether any extensions of this theory towards farm size can be drawn. However, in most industrialised countries, the amount of land under cultivation has remained fairly stable during past decades. If we therefore assume the farm area as a constant L, average farm size S in period t is simply

$$S_t = L/F_t = L/\sum_{j=1}^{t} (s_j{*}M_j) \qquad (13)$$

and the annual relative change in average farm size is

$$dS/S = (S_t - S_{t-1})/S_t = (L/\sum_{j=1}^{t} (s_j * M_j) - L/\sum_{j=0}^{t-1} (s_j * M_j))/L/\sum_{j=1}^{t} (s_j * M_j) \quad (14)$$

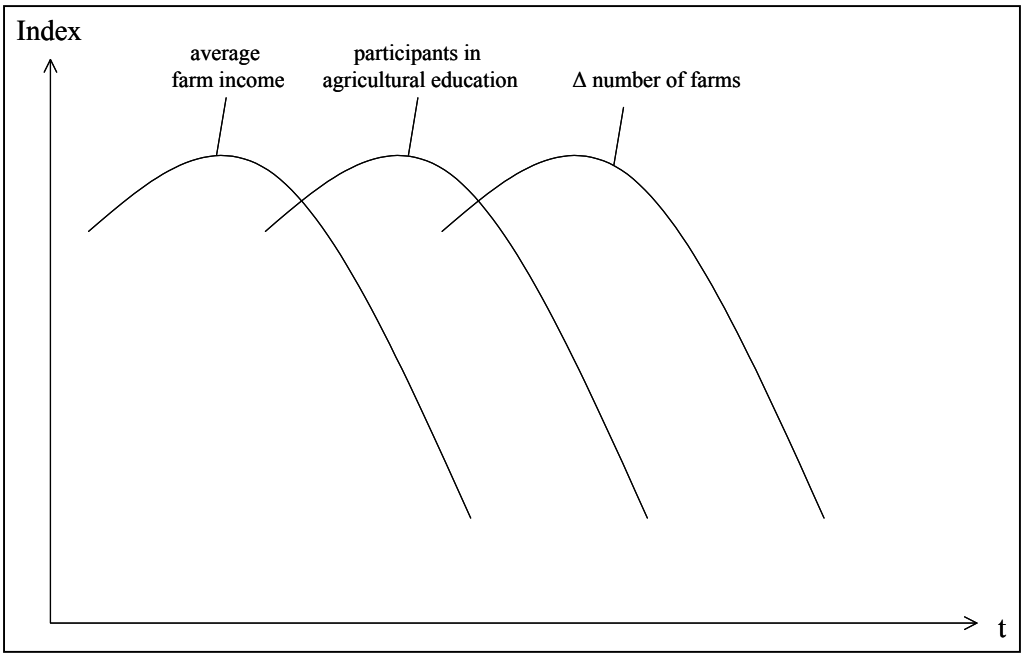
This indicates a reciprocal relationship between F and L, i.e. a decline in the number of farms necessarily implies a growing farm size. As the development of farm numbers has been shown to be dependent from demographic factors and expected utility from farming, so is farm size. This challenges earlier approaches who saw economies of scale (Gardner and Pope, 1978) or factor prices (Kislev and Peterson, 1982) as the main determinants of farm size.

These theoretical considerations lead to the second hypothesis that the number of persons who choose a farming career influences the speed of structural change in agriculture (defined as the development of the number of farms and the connected growth in farm size).

4. EMPIRICAL EVIDENCE

If the model developed in Section 3 is to be tested for its empirical relevance, the time aspect has to be given more thorough consideration. The static model neglects the fact that there will always be a time-lag between the observations. A high utility expected from farming will not only immediately lower the share of farms without a successor, as implied by the model. It will also increase the rate of school leavers that choose an agricultural training. After that choice has been made it will take some years for the training be it a practical apprenticeship or academic i.e. a university course, to be completed. Likewise, it is somewhat unlikely that the takeover will take place immediately after the training is finished. Usually, before succession, there will again be a gap of some years during which the successor will help on the farm or may take up a job elsewhere. This leads to the scheme explained in Fig. 3: The trend of farm closure rates will follow the trend of completed agricultural training with some time-lag, the trend of completed agricultural training will follow the income situation in agriculture with another gap. While past studies as cited in Table 1 summarized these two interrelationships into one, in this study both interdependencies will be looked at separately. The interdependence between sectoral income and occupational choice can be thought of as a very conscious decision-making process, whereas the dependence between occupational choice and structural change is mainly an automatism in which high sunk costs are involved already.

Fig. 3: Lagged dependence between sectoral income, occupational choice and structural change



4.1 Occupational choice

While there is some research on farm succession and its determinants, most authors fail to consider that the choice to follow an agricultural career will usually be separate from the succession of the family farm (Koch-Achelpöhler, 1998; Fasterding, 1999; Pesquin et al., 1999). Knowledge about the actual determinants of occupational choice is rare.

We try to explain occupational choices in Swiss agriculture between 1947 and 2001 by a regression. Beforehand, a few words about the patterns of occupational choice in Swiss agriculture may be useful. After compulsory education, many persons who consider becoming a farmer take a “Landwirtschaftliche Grundausbildung” (basic agricultural training). This three-year course consists of two years on-farm apprenticeship and one year at a vocational school. After that, between 10 and 40 per cent of persons with a pass in a basic agricultural exam choose to enrol in a two-year course for the title of “Meisterlandwirt” (agricultural master diploma).

While choosing the basic agricultural training course can be considered as a preliminary occupational choice at best, the diploma of agricultural master is usually taken in order to prepare for farm takeover. Since a decision to study for the diploma of agricultural master has very much the character of occupational choice, we choose the annual number of agricultural master exams MAST as our dependent variable. The dependent variable was chosen in spite of the fact that 80 to 90 per cent of farm successors do not hold a master diploma. As it can be shown that the share of successions by masters from total successions

grows only slightly over the years, the number of agricultural master exams remains a good proxy for occupational choice.

Table 2 summarises the variables used to explain the demand for agricultural training. One variable is taken from an occupational choice contribution by Drost (2002a). He shows that herd behaviour usually plays a role in occupational choice. While he shows that for a university subject the number of students choosing this subject is highly dependant on the numbers of students having done so before, we are going to test the transferability of this approach to non-academic careers like farming. We wish to test if the number of people choosing an agricultural career is dependent on the number of people having done so the year before (PEER).

A explanation for occupational choices with a stronger relation to our hypothesis is the past economic development of the respective sector (Drost, 2002b), since the past economic development strongly influences income expectations linked to the respective type of career. In agriculture, the economic situation is narrowly mirrored by the average agricultural income of farms. As the choice to enrol in the agricultural master course has to take place about three years before the exam is taken, the inflation-adjusted average agricultural net income from the fourth to the ninth year before the exam is used as an explaining variable INC. Compared, for example, with the agricultural gross income or the household income including off-farm sources, the net agricultural income of the farm seems to be the most relevant figure from which potential farm successors would be influenced in their decision. The data was taken from the central bookkeeping records of representative farms which have been held in Switzerland since the 19th century.

Table 2: Independent variables to explain MAST

Variable	*Meaning*
PEER	Level of MAST in the previous year
INC	Lagged agricultural income variable

Summarising, we want to test whether

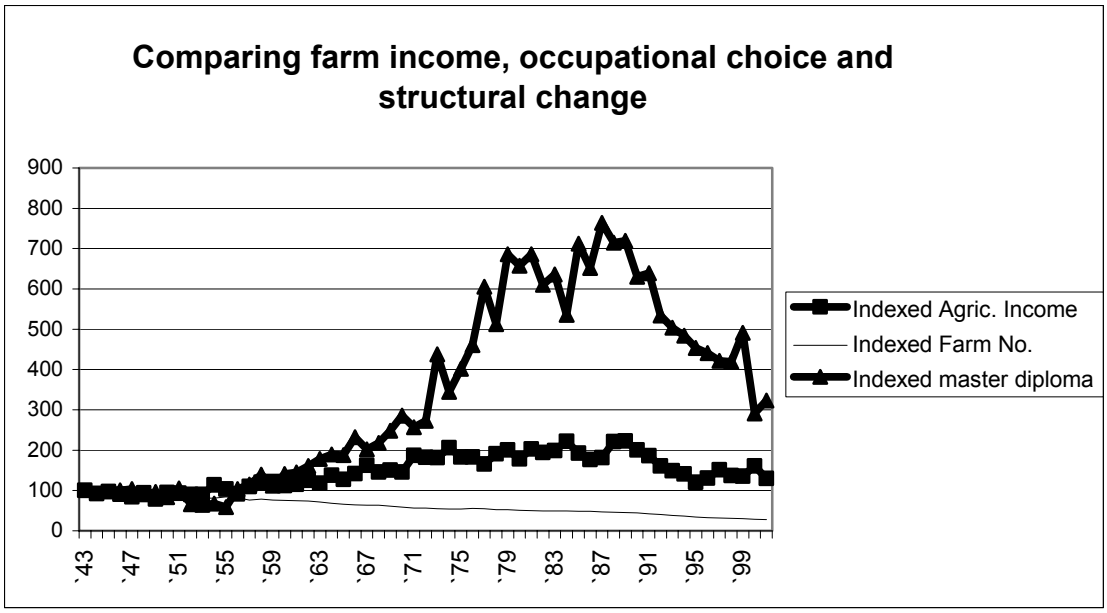
log MAST = f (log PEER, log INC).

A Durbin-Watson test confirmed the null hypothesis for autocorrelation, while the Breusch-Pagan test showed the absence of heteroscedasticity. As the variables were normally distributed, OLS could be applied.

Figure 4 shows the development of the inflation-adjusted agricultural income per farm 1943-2001, the indexed number of persons taking the basic agricultural exam during the same

time, and – albeit not in the regression - the development of the number of farms. It can already be seen that, while farm numbers seem to decline steadily, the number of exams and the agricultural income seem to follow a similar pattern.

Fig. 4: Development of agricultural income, occupational choice and farm decline, 1947-2001



Results of the regression are shown in Table 3. The number of persons studying for an agricultural master diploma is strongly determined by two factors. The first is the number of persons who have done so just before. This confirms the significance of herd behaviour, even with non-academic training. When people in your circle of acquaintances choose to follow an agricultural career, it becomes more attractive to do so yourself.

The other significant factor is the agricultural income. It can clearly be confirmed that high sectoral income opportunities enhance the willingness to enter an advanced education in the respective sector. That means that the model in section 2.1 explaining occupational choice by rational expectations tied to an agricultural career, is to some degree linked to reality and our first hypothesis can be confirmed.

Table 3: Explanatory Variables for MAST

Variable	*Coefficient*	*Standard Error*	*Probability Value*
Intercept	-7.2031	2.5891	0.0075
PEER	0.5980	0.1281	0.0000
INC	0.9667	0.3357	0.0058
R^2	0.95		

4.2 Structural change

It is not the aim of this section to add another general model to explain the number of farms to the ones summarized in Table 1, but to specifically link the aspect of occupational choice to the changing numbers of farms. A finished education already involves considerable sunk costs, and only under special circumstances will an agricultural education not result in the succession on a farm. However, while it has proved relatively easy to trace back occupational choices to the economic situation of the sector, it will be far more difficult to statistically link the rate of decline in the number of farms to occupational choices. One of the two main reasons for that is the fact that more than one route may lead to a farming career:

- Particularly at the beginning of the time-series, in the mid-twentieth century, it has been very common to take over a farm without taking up any formal education.
- The role of agricultural courses at higher education level has been changing too. While the number of university students of agriculture have followed similar patterns as the numbers of persons choosing the agricultural master diploma, the pathway of completing a three-year course at the Technical College of Agriculture in Central Switzerland as a preparation for farm takeover has been gaining in importance during recent years.

A second considerable difficulty in statistically tracing structural change back to past occupational choices is the time factor. There is a time-lag between completing the agricultural master diploma and taking over a farm. The size and distribution of this time-lag is largely unknown and will vary over the span of the time-series data. However, in Switzerland it is limited by the fact that one can only take a master diploma from the age of 25 years onwards and that most farm successions happen in the early 30's of the successor.

What is more, the number of masters has to be set into relation to the number of farms, as 300 masters per year in a country with 150,000 farms will lead to a different rate of structural change than 300 masters per year in a country with 75,000 farms.

To link the number of master diplomas to the rate of farm decline, a five-year average of master diplomas taken in Switzerland between 1946 and 2001 divided by the number of farms (MAFA) is used as an explaining variable for the annual rate of farm decline dB/B in the subsequent year. While MAFA is thought to cover the labour availability for farming, the capital availability has to be taken into consideration by using the interest rate as another independent variable. It has already been shown (Everett and Watson, 1998) that the average level of interest rates (INT) is crucial for explaining structural development. To determine the time trend in addition to that, the year is used, so that it looks like this:

$\Delta F/F = f$ (log MAFA, INT, YEAR).

Again, OLS was chosen as a functional form as heteroscedasticity and autocorrelation could be excluded by the tests as described in Section 4.1.

Table 4: Independent variables to explain ΔF/F

Variable	*Meaning*
YEAR	Year (1943=0, 1944=1,...)
MAFA	Passed Master diploma as a share of existing farms (lagged)
INT	Average mortgage rate

The results, as can be seen in Table 5, show a much lower coefficient of determination compared with that explaining occupational choice, due to the reasons stated above. There is a clear time trend that shows how structural change is apparently accelerating, while the significance of the interest rate could not be proven. The number of master diplomas as a proxy for occupational choice does apparently play a role in explaining structural change, so that the second hypothesis can be confirmed.

Table 5: Explanatory variables for ΔF/F

Variable	*Coefficient*	*Standard Error*	*Probability Value*
Intercept	21.8388	11.1634	0.0564
YEAR	-0.1878	0.0713	0.0114
INT	-0.3599	0.3771	0.3448
MAFA	2.3634	1.1519	0.0458
R^2	0.18		

5. POLICY IMPLICATIONS

Regarding structural change in family farm systems, the position of agricultural policy makers is usually ambivalent. On the one hand, increasing average farm size and therefore structural change is perceived as a precondition to exploit economies of scale and thus enhance sectoral efficiency. On the other hand, structural change can lead to social hardship which should be avoided. In what range, then, should structural change take place and which, if any, are appropriate policy tools?

The results of this paper points to an answer. It could be shown that one important source of structural change are ‘failed successions’, i.e. farms that are abandoned after the farmer’s retirement. If the income and other sources of utility in farming are low, none to few successions will happen, as young people prefer to choose an alternative career. This sort of structural change is unproblematic from a social point of view. If one assumes that the farmer

is in charge for a period of 30 years, this sort of structural change, however, is restricted to a maximum of about 3.3 per cent.

Stronger structural change is, of course, possible. Under particularly unfavourable conditions for farming, it will become necessary for active farmers to shift into another sector. Given that they will have invested considerably in their agricultural training (on-farm and off-farm), this leads to social hardship for the farmers and is also a waste of human resources. Hence, a rate of structural change above the rate with which farmers go into retirement should be avoided if possible.

A second conclusion is to be drawn for agricultural policy. Countries like Australia or Canada are quite active in supporting young farmers. Countries which are not are often pushed toward young farmers' support by pressure groups (Miguel, 2001). This is enhanced by the notion that school leavers in most family farm systems are currently very reluctant to choose an agricultural career. In Germany, 4930 agricultural apprenticeships have been offered to school leavers in 2002, but only 1380 were applied for (Kanowski, 2002). 55 per cent of European farmers are older than 55 years, indicating that in Europe we are to expect relevant structural change in the near future. It is, however, essential to recognise that with each graduate drawn into farming, the state reduces its leeway to allow for socially acceptable structural change.

This view is, of course, only true for family farm systems as we find in most parts of the western world. For transformation countries, structural change in recent years has usually meant that a new class of family farms was up and coming. In bipolar agricultural systems with large corporate farms on the one hand and small(er) family farms on the other, the dynamics between occupational choice and structural change still have to be discovered.

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