Working Paper Series No. 1, January 2004

OF FARMERS AND BUTCHERS – COMPARING THE DETERMINANTS OF EXIT IN SHRINKING SECTORS

Stefan Mann and Juliane Mante

agroscope

FAT TÄNIKON

Of farmers and butchers –
comparing the determinants of exit in shrinking sectors

STEFAN MANN AND JULIANE MANTE [*]

JEL classification: C5, D1, L1, N5

Keywords: exit, agricultural structures, butchers, comparative economics

1. INTRODUCTION

Browsing through the literature of structural change in shrinking sectors, one is quickly struck by the impression that research on the determinants of exit in agriculture as the main constituent of the primary sector has taken place almost independently from research on firm exit in the secondary and tertiary sector.

In agriculture, there has always been a variety of distinct explanations for exits, or rather for *the lack of* exits. It has been widely believed that incomplete information and the factor of personal choice like preference for a rural lifestyle lead to long-term imbalances of factor use inside and outside farming (HENRICHSMEYER and WITZKE, 1991; OECD, 1994). This phenomenon has widely been perceived as a singularity of the farm sector. The fact that in agriculture, we usually find a large number of firms, made econometric analysis of the underlying causes of economic development becoming familiar in recent years. Studies on farm level (WEISS, 1999; BAUR, 1999; HOFER, 2002), on regional level (RÖSTI, 1997; HUFFMAN and EVANSON, 2001; MANN, 2003) and national level (HOFREITHER and WEISS, 1992; SCHMITT and ANDERMANN, 1996a; SCHMITT and ANDERMANN, 1996b) showed that a fair share of farm closures could be explained by economic factors, such as labour costs, farm product prices and direct transfer payments. This weakens the hypothesis that it is mainly path dependency (BALMANN, 1997) which keeps farmers in business and is creating inefficient farm structures.

Outside farming, it was as well helpful that the traditional, very general theories about structural change (SCHUMPETER, 1952; SPIETHOFF, 1955; DUJIN, 1983) were accompanied by case studies carried out in the nineties on the determinants of exits. On the one hand, they revealed the economic rationale of exits, including shrinking sectors (FLYNN, 1991; AUDRETSCH, 1994; LOVE, 1996; EVERETT and WATSON, 1998). In the steel industry, for

example, MOORE (1998) showed how production quotas hampered growth opportunities of small steel mills, while RAHMEYER (1992) described the impact of supply and demand developments on exits and other constituents of structural change. On the other hand, such case studies showed that also structures in the industry are still far from optimal: MISRA, MCPEEK and SEGARRA (2000)'s study on the cotton ginning industry in Texas, for example, indicate that restructuring would bring about enormous saving potentials.

It has thus be shown that there may be more economic rationale in agricultural structures and less in industrial structures than it has been assumed. However, direct comparisons are missing. It is still to be shown whether it is true that the agricultural sector reacts to a lesser extent on economic influences than other sectors do. It is one of the aims of this paper to elucidate this. Another aim is to compare the particular factors responsible for exit between farming and other shrinking sectors. We compare the patterns and the causes of exits among farmers and butchers in Switzerland between 1982 and 2001. Both sectors show a similar development of decreasing numbers during that time, as will be shown in Section 2. Data availability from both sectors allows for an approach that takes account of the profit of the enterprise as a variable explaining continuity or closure. The method is described in Section 3, while the results of the comparison are presented in Section 4. Section 5 concludes.

2. COMPARISON OF SECTORS

Agriculture and craftsmanship have always been interdependent partners (BURK, 1988). However, craft is a sector that is much more heterogeneous than agriculture. It makes therefore sense to compare only one segment within that field with the farm sector rather than craftsmanship as a whole. For more than one reason, butchers seem suitable for such a comparison. Butchers unite characteristics of the secondary sector (meat processing) and the tertiary sector (meat retailing). Their interdependence with the farming sector is more visible than that of other sectors, since butchers process and trade farm products and are therefore part of the agribusiness chain. Farmers and butchers in Switzerland predominantly head small businesses. Almost all Swiss farms are family owned farms, and the vast majority of butchers head a family enterprise: Less than ten per cent of butchers have more than one salespoint. A few farmers and butchers decide to leave their business during their working life, usually voluntarily, but the vast majority of structural change happens through the owners of such businesses going into retirement without a successor (STIGLBAUER and WEISS, 1999). Common to both sectors is that the closure of enterprises usually does not come about through bankruptcy.

More importantly, however, farmers and butchers in most industrialised nations are also united by the fact that they have experienced a decline in their numbers. Figure 1 and Figure 2 show the patterns of this process for Switzerland during 1982-2001. It can be seen that the number of farms as well as the number of butchers declined to around 60 per cent of the original number during that time. It is clear, however, that this process took place on very different levels. While there were around 70000 farms in 2001, there were only 1500 butchers.

Declining numbers of businesses can be due to concentration processes defined as a more or less constant level of activity shared among less enterprises as in the banking industry (BIKKER, 2000), or to a sectoral decline as a whole. Figures 1 and 2 show that for butchers and farmers, the latter is the appropriate diagnosis: the sectors barely shrunk. As a growth indicator, sectoral turnover is used, i.e. the monetary value of all goods sold in the respective sector. Parallel to the downward development of the number of businesses, this sectoral turnover decreased, too. That means that the average turnover per business remained more or less stable. To calculate the sectoral turnover for the farming sector the fact that since the nineties Swiss farmers receive a fair share of their income from direct payments from the federal budget has to be mentioned. This is not bound to their output and only loosely to certain environmental quality standards. It is disputed whether direct payments should be included in sectoral turnover figures. The main argument to do so is that direct payments mirror the delivery of public goods by farmers. Even if one includes direct payments in sectoral turnover, however, it does not reverse the downward development of sectoral output.

Fig.1: Sectoral turnover and number of farms (indexed; Source: National Statistical Bureau; Swiss Farmers Union)
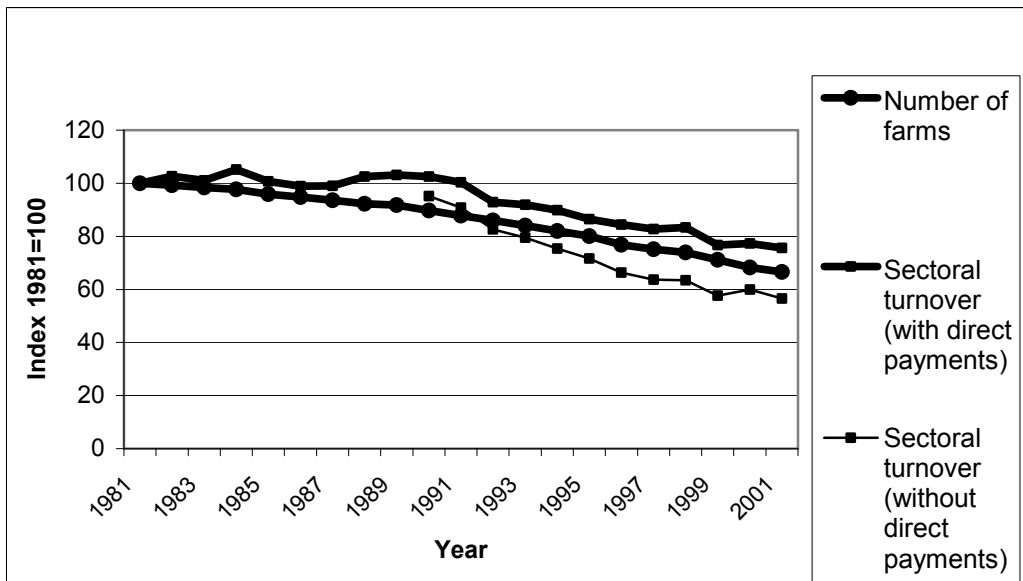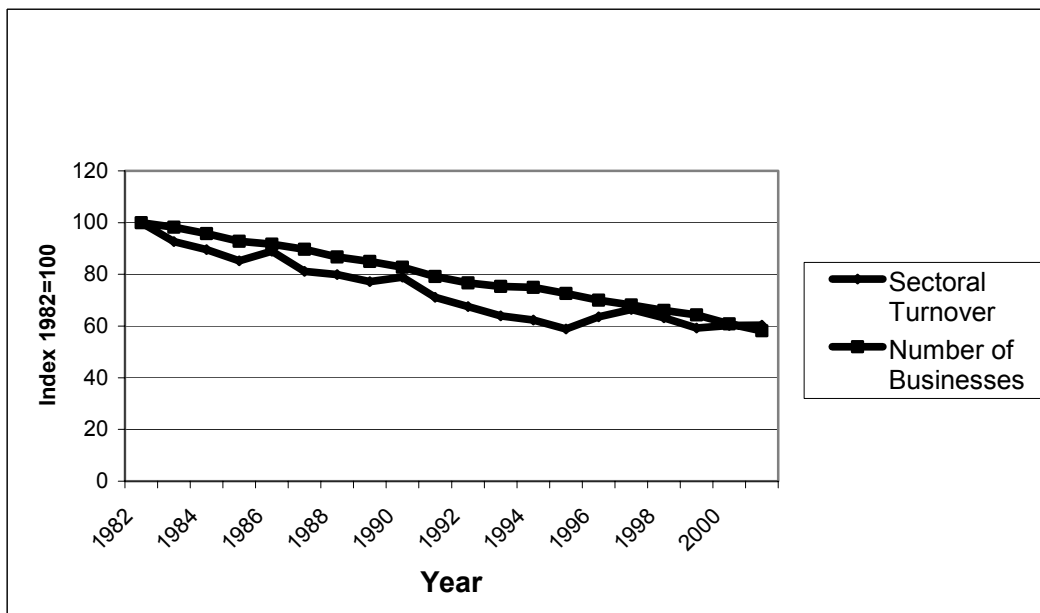

Fig.2: Sectoral turnover and number of butchers (indexed) (Sources: Metzger-Treuhand AG, Butchers Union)

The causes for the process of shrinking, however, are certainly different for farmers and butchers. For farmers, most agricultural economists use the term "farm problem" to describe the causes for steadily declining numbers of farms and farmers (KNUTSON, PENN and FLINCHBAUGH, 1998). Swift technical progress in agriculture and a shift in factor use from labour to capital, connected with low demand and income elasticities on the consumers' side led to the fact that one farmer can feed an ever growing number of people, in Switzerland from 10 in 1950 to 140 today. For butchers, the saturated (in Switzerland, even declining) demand for meat in industrialised countries is a connected cause for structural change. The main problem, however, is not the market for meat, but the butchers' market share. While retailing in Switzerland is traditionally a segment with rather low growth, (KNESCHAUREK and MEIER, 1983), the butchers are mainly challenged by competition of the two dominating Swiss supermarket chains. Competing with supermarket chains is a problem for butchers internationally (BREITENACHER and TÄGER, 1990; WÖHLKEN, 1991), but the market power of the two oligopolists Migros and Coop in Switzerland (WINKLER, 1991) makes the economic situation for butchers in Switzerland particularly severe.

Figure 3 shows that, in spite of this difficult situation, the fast structural change led to an almost constant net profit for every butcher, while the average agricultural income for every farm moved significantly downwards since 1989, due to a replacement of price support schemes with direct payments in agricultural policy. The notion that the butchers' net profit lies now usually above an average farm income, should, however, not be overemphasised. Many farmers have an additional off-farm income, get payments in kind from their own farm and rarely have to pay rent for their home.

Fig. 3: Comparing profits of butchers and farmers, deflationed average per enterprise (Source: Metzger Treuhand AG; Farm Accountancy Data Network)
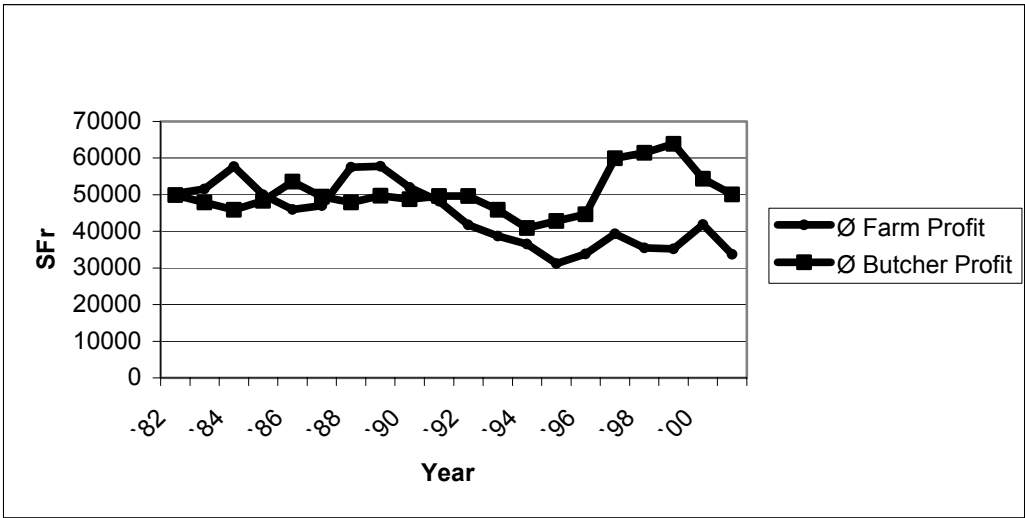
3. METHOD AND DATA

While structural change for Swiss farmers and butchers has been described in the last section, it yet has to be explained. In order to quantify structural change, we take the relative change in the number of businesses ($\Delta B/B$) per region and year as a dependent variable for the regression. The causes of structural change can best be compared between the two sectors if we use the same independent variables to explain $\Delta B/B$. $\Delta B/B$ was measured for six regions in Switzerland for the years 1982 until 2001 (Northern/ Western/ Southern/ Eastern/ Central Switzerland and Swiss Midlands), so that n=120 each for farms and butchers.

Sectoral as well as macroeconomic variables were used in order to explain structural change. As the (main) income and investment source of the owner of the business, the profit of the business can be assumed as vital for the survival of the firm. 4,000 out of the 70,000 Swiss farms share their books with the Federal Research Station for Agricultural Economics; the fact that they are a representative sample of all farms means that reliable and representative income data exists, even on a regional base. Only on-farm income (including direct payments) went into the variable PROF for farms and was determined as an average inflation-adjusted income within a regional group of farms for the five years before the respective year. Off-farm income, however, is vital for a great number of farms too. We therefore used the inflation-adjusted off-farm earnings (EOFF) as the only variable that was exclusively applied for farms. Within each group, an average was calculated on the base of all farms, not only from households with off-farm activities. Again, the average of the last five years were found to be a suitable variable. Although the decision to work off-farm may be connected with an exit decision, the connection between the two variables is random enough to treat EOFF as exogenous variable (WEISS, 1999). For estimating the average income of the butcher sector, half of all Swiss butchers use one bookkeeping agency that specialises in butchers. This agency supplied regional data of butchers' average net profit. For the regression, the inflation-adjusted average annual net profit per business for the last five years was used for the variable PROF.

The unions of both farmers and butchers keep long-term records of the relevant prices for their sectors. This includes product prices (farm products in general for farmers, meat for butchers) as well as factor prices. The average index of product prices from the last five years was used as an explaining variable (PPRO), having been adjusted for inflation. High product prices were assumed to serve as a positive signal and keep the enterprise in business. There was no multicollinearity problem between the level of prices and profit. Factor prices for butchers are primarily animal prices, whereas for farmers the factor price index consists of a broad range of feed, petrol and machinery prices. Rising factor prices

may, once again, provide a signal to leave the business (and vice versa). Their inflation-adjusted average over the past five years was used in the regression as an index (PFAC). It is well known that high interest rates discourage investment and may therefore lead to an earlier closure of a firm (SPIRO, 1989). These capital costs (interest rate for mortgages) were therefore also included in the regression (INTR). The same applies for labour costs. High labour costs may deter essential employment within the business on the one hand and increase opportunity costs of running a business on the other. An inflation-adjusted index of labour costs was therefore also included (WAGE). Although labour and capital are important production factors, neither of the two variables is included in the two factor price indices PFAC.

Another indicator for opportunity costs while running a business is the rate of unemployment. The more difficult it is to find a job, the more it seems to be the best option to stay in business. High unemployment may therefore increase entrepreneurship (RITSILÄ and TERVO, 2002) and slow down structural change. For this reason, regional unemployment rates are included as a variable.

Table 1: Variables and Data Sources

Variable*	Data Source Farms	Data Source Butchers
Relative decline in businesses (∆B/B)	National Statistical Bureau; regional	Members of Butcher Association; regional
Net Profit (PROF)	Farm Accountancy Data Network; regional	Metzger-Treuhand AG (Bookkeeping agency for butchers); regional
Off-farm earnings (EOFF)	Farm Accountancy Data Network; regional	
Product Prices (PPRD)	Swiss Farmers Union; national	Union of Swiss Butchers; national
Factor Prices (PFAC)	Swiss Farmers Union; national	Union of Swiss Butchers; national
Interest rate (INTR)	Swiss National Bank; national	
Wage rate (WAGE)	State Secretariat for Economic Affairs; national	
Unemployment rate (UEMP)	State Secretariat for Economic Affairs; regional	

* In addition, five regional dummy variables were used for both sectors.

Table 1 summarises the used variables and their data sources. Since the dependent variable ∆B/B refers to business groups of which some consist of 10,000 farms, others of 25,000 farms, Weighed Least Square method was used to take size differences into account. The relative weight of the samples was distributed in accordance to the number of enterprises per group.

4. RESULTS

Table 2 summarizes the range of the data for farmers and butchers. It can be seen that the rate of exits as well as total income is comparable between both sectors, except that the farm groups' income has a higher standard deviation than the butchers'. Table 3 shows the results of the regressions for butchers and farms. However, it can be said that the determinants of exit differ considerably between butchers and farmers.

Table 2: Data summary of variables

	Mean	Minimum	Maximum	Std. Dev.
Butchers				
$\Delta B/B$	-2.53	-10.49	3.75	2.36
PROF	48208.94	38009.08	56087.66	5027.05
PPRD	17.65	15.36	19.14	1.02
PFAC	7.28	5.25	8.66	0.99
Farmers				
$\Delta B/B$	-2.05	-11.00	-0.23	1.59
PROF	41578.64	19857.68	59730.82	10221.50
EOFF	8485.22	5675.21	17076.24	2374.89
PPRD	79.15	55.33	95.52	12.70
PFAC	75.20	55.11	84.39	8.80
Economy				
INTR	5.54	3.90	7.83	1.12
WAGE	273	253	284	9.09
UEMP	2.21	0.11	7.50	1.92

In the case of butchers, the profit of the business seems to be a key decision factor for carrying on or leaving the business. The profitability of the enterprise will in many cases also be a core criterion for a potential successor in his decision whether to take over or not. An additional income per butcher and year of 10,000 SFr. decreases the number of abandoned enterprises by four per cent. In general, the relation between profit and exit is what could be expected from a viewpoint of economic rationality.

Having said that, it is peculiar that the actual profit apparently does not play a role in agricultural structural change. Neither the farm's profit nor the level of off-farm income seems to influence the decision to operate the farm in the future. Instead, the level of prices is apparently a core determinant for structural change in agriculture. Low product prices and high factor prices have the potential to increase structural change significantly.

Causes for this difference can only be guessed. Actually, the profit of farmers (usually referred to as "agricultural income") is a bit of an artificial construct. As household and enterprise are interdependent in farming to a degree unknown in other sectors, it may sometimes be hard for farmers to recognise the relevance of their written-down profit. The

range of prices, however, are variables much easier to comprehend. Although objectively, what matters for the success of an enterprise are profits not prices, psychologically farmers seem to rely much more on the latter.

Both farmers and butchers are dependent on the interest rate, although its significance for butchers could only be proven on a seven per cent level. The notion that high interest rates lead to business failure, however, only confirms evidence from Australia for the whole small business sector (EVERETT and WATSON, 1998).

While the level of unemployment appears to be insignificant for structural change in both sectors, labour costs play apparently a different role in them. Butchers seem to rely to such an extent on family labour with low opportunity costs that the level of labour costs does not matter. The significant positive sign of WAGE for farmers, however, is peculiar. It implies that farmers tend to leave their business if the level of wages is down. If at all, this can be explained by the negative supply elasticity of labour (BORJAS, 1996). Part-time working farmers may need to spend more (or even all their) time at their external source of income once wages shrink, in order to earn a sufficient amount of money.

Table 3: Comparison of determinants for structural change

Variable	Farms		Butchers	
	Parameter	Probability value	Parameter	Probability value
Intercept	-43.8188	0.0009	-19.6318	0.2922
PROF	0.0000	0.1882	0.0004	0.0031
EOFF	0.0000	0.6761		
PPRD	0.2570	0.0001	0.2783	0.8690
PFAC	-0.1411	0.0157	-0.2717	0.8948
INTR	-0.3298	0.0201	-0.5863	0.0747
WAGE	0.1304	0.0043	0.0023	0.9694
UEMP	-0.0353	0.7086	0.0485	0.8609
R^2	0.5118		0.1754	

The five regional dummy variables are not reported.

Last but not least, it has to be emphasised that the coefficient of determination is far higher for agriculture than for butchers. It is unlikely that this is due to a data problem since similar data from similar sources was used. Definitely, the idea can be rejected that structural change in agriculture is not as much driven by purely economic factors than structural change in other shrinking sectors, such as butchers. If anything, farmers may decide about the future of their farm with more economic rigour than butchers do, even if the economic criteria themselves are different.

5. CONCLUSIONS

The comparison of two shrinking sectors has revealed significant differences between the underlying causes of structural change. While butchers take their businesses' profit as a criterion to carry on, farmers prefer to use relevant prices for deciding whether to abandon a farm or not. With the use of the economic indicators in the analysis, more than half of agricultural structural change could be explained, but only one sixth of structural change for butchers; for them, presumably non-economic criteria seem to play a more important role. The differences mean more than just that. They also show the importance of sectoral approaches in explaining structural change. Different branches follow different patterns, even if they are both dominated by small businesses and even if their decline looks similar in sheer numbers. This points to the importance of sector-specific research, sometimes called meso-economics, as it is situated between microeconomics as the analysis of particular markets and macroeconomics as the analysis of the whole economy. Mesoeconomics (NG, 1986) appears to be still a vastly underdeveloped area. A more intensive focus on the specifics of sectors among economists could potentially provide a better understanding of economic structures.

While economists have largely understood the technical specifics of the farming sector, it will be worthwhile to explore the behavioural specifics of this and other sectors by the means of comparative research. This aspect does not only affect exit decisions. The determinants of an enterprise's portfolio and of its investments may be influenced to a stronger degree by the peculiarities of sectors than most of us would believe.

REFERENCES

AUDRETSCH, D.B. (1994), *Business Survival and the Decision to Exit.* Journal of the Economics of Business 1, 125-137.

BALMANN, A. (1997), *Farm-based modelling of regional structural change: A cellular automata approach.* European Review of Agricultural Economics 24 (1) 85-108.

BAUR, P.T. (1999), *Agrarstrukturwandel in der Schweiz.* Zürich.

BIKKER, J.A. (2000), *Competition and concentration in the EU banking industry.* Kredit und Kapital 33 (1) 62-98.

BORJAS, G.J. (1996), Labor Economics. New York: McGrawHill.

BREITENACHER, M., U.C. TÄGER, 1990: *Ernährungsindustrie – Strukturwandlungen in Produktion und Absatz.* Berlin: Duncker & Humblot.

BURK, F. (1988), *Aus der Sicht des Handwerks.* In: Landwirtschaft und mittelständische Wirtschaft – Partner beim Strukturwandel. Tübingen.

DUJIN, J.J.V. (1983), *The Long Wave in Economic Life*. London.

EVERETT, J., J. WATSON (1998), *Small Business Failure and External Risk Factors*. Small Business Economics **11** (4) 371-390.

FLYNN, J.E., (1991), *The Determinants of Exit in an Open Economy.* Small Business Economics 3, 225-232.

HENRICHSMEYER, W., H.P. WITZKE (1991), *Agrarpolitik. Bd. 1: Agrarökonomische Grundlagen.* Stuttgart.

HOFER, F. (2002), *Strukturwirkung von Direktzahlungen.* Zürich.

HUFFMAN, W.B., R.E. EVENSON (2001), *Structural and productivity change in U.S. agriculture, 1950-1982.* Agricultural Economics **24** (2) 127-147.

KNESCHAUREK, F., P. MEIER (1983), *Der sektorale Strukturwandel in der Schweiz von 1960 bis 1980*. Diessehofen: Rüegger.

KNUTSON, R.D., J.B. PENN, B.L. FLINCHBAUGH (1998), *Agricultural and Food Policy.* Upper Saddle River: Prentice Hall.

LOVE, J.H. (1996), *The Determinants of Variations in Exit Rates.* Empirica 23, 107-118.

MISRA, S. K, B. D. MCPEEK, E. SEGARRA (2000), *Optimal Structure of the Ginning Industry in the Southern High Plains of Texas.* Review of Agricultural Economics 22, 120-133.

MOORE, M.O. (1998), *European steel policy in the 1980's: Hindering technological innovation and market structure change.* Weltwirtschaftliches Archiv **134** (1) 42-68.

NG, Y.-K. (1986), *Mesoeconomics: a micro-macro analysis*. Brighton.

OECD (1994), *Farm Employment and Economic Adjustment.* Paris.

RAHMEYER, F. (1992), *Structural adaptation in the iron and steel industry – market theory analysis and economic strategies.* Jahrbuch für Sozialwissenschaft **43** (2) 243-266.

RITSILÄ, J., H. TER (2002), *Effects of Unemployment on New Firm Formation: Micro-Level Panel Data Evidence from Finland.* Small Business Economics **19** (1) 31-40.

RÖSTI, A. (1997), *Auswirkungen der Agrarpolitik 2002 auf die Schweizer Landwirtschaft.* Zürich.

SCHMITT, G., G. ANDERMANN (1996a), *Bestimmungsgründe der „sozialökonomischen" Strukturanpassung der Landwirtschaft in der BR Deutschland.* Agrarwirtschaft **45** (2) 102-111.

SCHMITT, G., G. ANDERMANN (1996b), *Agrarpreise und betrieblicher Strukturwandel in der Landwirtschaft.* Agrarwirtschaft **45** (8/9) 323-333.

SCHUMPETER, J. (1952), *Theorie der wirtschaftlichen Entwicklung. Eine Untersuchung über Unternehmergewinn, Kapital, Kredit, Rente und den Konjunkturzyklus*. Berlin.

SPIETHOFF, A. (1955), *Die wirtschaftlichen Wechsellagen*. Tübingen.

SPIRO, P.S. (1989), *Real interest rates and investment and borrowing strategy*. New York.

STIGLBAUER, A.M., C.R. Weiss (1999), *Family and Non-Family succession in the Upper-Austrian Farm Sector*. Presentation on EAAE-conference, Warszaw.

WEISS, C (1999), *Farm growth and survival: econometric evidence for individual farms in Upper Austria.* American Journal of Agricultural Economics **81** (1) 103-116.

WINKLER, V. (1991), C*oop und Migros: Genossenschaften in Konkurrenz und im Wandel der Zeit.* Chur: Rüegger.

WÖHLKEN, E. (1991), *Einführung in die landwirtschaftliche Marktlehre*. Stuttgart.

ABSTRACT

Farmers and butchers in Switzerland both operate in shrinking sectors. The number of businesses and the sectoral turnover has decreased by about 40 per cent over the last twenty years for both sectors. It is, however, an interesting question whether the determinants of exit are the same for the primary sector and the secondary and tertiary sector. A regression analysis reveals that, for farmers, a larger part of exits can be traced back to economic factors if compared to butchers. For butchers, the profit of the business is the key determinant of structural change, whereas for farms, the level of prices is an important signal factor. Interest rates influence structural change for both sectors. The study points to the importance of sector-specific research.

ZUSAMMENFASSUNG

Landwirte und Metzger in der Schweiz sind in schrumpfenden Sektoren tätig. Die Anzahl der Unternehmen hat in den letzten zwanzig Jahren in beiden Sektoren um 40 Prozent abgenommen. Es ist jedoch eine interessante Frage, ob die Bestimmungsgründe des Ausstiegs im Primärsektor die gleichen sind wie im Sekundär- und Tertiärsektor. Eine Regressionsanalyse zeigt, dass bei Landwirten ein grösserer Teil der Betriebsaufgaben durch ökonomische Faktoren erklärt werden kann. Bei Metzgern ist der Gewinn des Unternehmens ein Kernfaktor für Strukturwandel, während für Landwirte Preise ein wichtiger Signalfaktor sind. Der Zinssatz beeinflusst den Strukturwandel in beiden Sektoren. Die Studie zeigt die Relevanz sektorspezifischer Forschung auf.