Impediments to Employment and Enterprise Diversification: evidence from small-scale farms in Poland *

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ABSTRACT

In an environment of low returns to agricultural activities and slow structural change, both employment and enterprise diversification have been presented as possible strategies for raising the incomes of farm households. This paper focuses on the barriers to taking up off-farm employment and establishing new non-agricultural enterprises. Factor and cluster analysis are applied to a data-set of individual farms in Poland in order to identify groups of households facing similar constraints and profile policy measures that are most likely to assist diversification. The majority of non-diversifiers are unlikely to become pluriactive in the near future due to a combination of age, a desire to concentrate on farming and remoteness. Farm households that are willing to diversify are characterised by the lowest agricultural incomes. For these households, a poor endowment of human and physical capital is a major constraint.

1.   Introduction

Peasant farming in many countries generates inadequate income streams (Tisenkopfs, 1999) with production characterised by a structural problem of too many people trying to earn a living from farms of insufficient size. One strategy to deal with this problem is the diversification of agrarian livelihoods (Ellis, 2000). Farm household diversification may come about through either engagement in salaried non-farm positions (employment diversification) or through the establishment of non-agricultural business activities (enterprise diversification). While both enterprise and employment diversification have been supported, the barriers to engaging in non-agricultural economic activities are poorly understood (Lanjouw, 1999).

The diversification literature has generally sought to analyse the factors that affect its uptake focusing on factors that differentiate diversifiers from non-diversifiers. Chaplin *et al*. (2004) undertook such analysis for Poland and found that the level of general education and frequency of public transport have a positive and significant effect on both employment and enterprise diversification. The propensity to take up off-farm employment was negatively related to the level of unearned income (pensions, disability and unemployment benefits etc.), specialisation within agriculture and distance to public transport.

The present research aims to contribute to the literature by focusing on non-diversifiers in order to examine the reasons for their lack of, and barriers to, diversification. Understanding the differing reasons for rural households not diversifying in spite of generally low returns to agricultural activities can contribute to producing more realistic and better tailored rural development policy. The objective of this paper is thus to investigate the impediments to employment and enterprise diversification, using a dataset of Polish farm households, and to identify the impact of policy instruments on the propensity to diversify. Furthermore, using factor and cluster analysis, groups of households facing similar constraints are identified according to their region, socio-economic and farm characteristics. The likelihood of each cluster diversifying in response to potential policy measures is assessed. The latter can help improve the targeting of policies to facilitate the development of alternative sources of income whether at a national or regional level.

The paper is structured as follows. The next section presents an overview of peasant farming in Poland, identifying the main structural problems. Section 3 discusses the methodology employed for profiling peasant households that have not engaged in enterprise and employment diversification, identifying the varying barriers faced. The dataset of Polish farm households and results are presented in Sections 4 and 5 respectively. Conclusions and policy implications are drawn in Section 6.

2.   Structural Problems of Polish Agriculture

In contrast to most Central and Eastern European Countries (CEECs) or the successor states of the Former Soviet Union, Polish agriculture was not extensively collectivised during the communist era. By the end of the communist era, individual private farms occupied approximately four-fifths of Poland's utilised agricultural area (UAA) and accounted for a similar share of total farm labour. These individual farms were almost universally small-scale, typically less than 10 hectares (ha) in size and were characterised by low labour productivity and poor returns (Mech, 1999).

The degree to which rural households need to generate alternative income streams is illustrated by data from the annual survey of bookkeeping individual farms carried out by the Polish Institute of Agricultural and Food Economics (IERiGZ), which covers about 1,200-1,300 farms. Nearly 40 percent of these farms are loss making even when only paid inputs are considered (Davidova *et al.*, 2002). The returns on own labour and lands are exceptionally low and this situation of poor private profitability mirrors the findings of research on the international competitiveness of Polish agriculture (Gorton *et al.*, 2001). As a result, out of nearly 2 million farms, only 400 to 500 thousand farms are thought to be sustainable in the mid-term (European Commission, 1998).

Despite low current economic returns and the fact that consolidation of agricultural activities would lead to substantial efficiency gains (Latruffe *et al.*, 2005), structural change in the Polish agricultural sector has been slow. In fact rather than farm consolidation, the proportion of farms in the smallest size category (between 1 and 2 ha) increased from 17.7 percent in 1990 to 23.8 percent in 2000 (GUS, 2001). Concentration has been hampered by problems with access to credit, an imperfect land market, a lack of opportunities in the non-farm rural economy and the system of Polish pensions. Land legislation is still not favourable to tenants and cannot stimulate the lease market (Pouliquen, 2001).

Under these circumstances, diversification has been presented as a feasible way out, at least in the mid-term, of the vicious circle of fragmented farms, poor profitability and low incomes. Agricultural diversification has been promoted via both domestic policy and the EU through its pre-accession instrument, SAPARD, and a recent World Bank study (2001) found that the incomes of Polish agricultural households have become more diversified. However, the growth in income diversification was mainly due to unearned income (e.g. old age and disability pensions) and/or employment in the informal sector. The level of diversification through formal employment and enterprise creation appears low and there is a need to understand the barriers to such strategies.

3.   Methodology

For the purposes of this study, diversification is defined as other gainful activities outside of the primary production of food, fibre and fuel (Slee, 1987). Thus, it includes off-farm employment and non-agricultural enterprises, which could be either on- or off-farm.

As the analysis in this paper aims to identify farm households with common impediments to diversification, cluster analysis has been chosen as the main analytical method. This is due to its strengths in defining groups of objects, or farm households in this case, with the maximum homogeneity within groups while having maximum heterogeneity between groups (Hair *et al.*, 1998). While other analytical techniques, such as regression or logit analysis, are useful for establishing the relationship between independent variables and the likelihood of diversification, they are inappropriate for identifying groups of farm households facing similar impediments. The latter was felt to be an important feature of the analysis, since, in terms of guiding policy, it is useful to know the size and features of such groups in order to develop policies that may be better focused at overcoming the barriers they face to diversification or in other cases recognising that some groups are extremely unlikely to diversify regardless of the policy environment. The identified clusters thus form the basis of a discussion of how policy can be better targeted to meet the needs of different groups of farm households subject to particular constraints.

In conducting cluster analysis multicollinearity amongst the variables used is a common problem. Ketchen and Shook (1996) suggest two solutions to address this. One is to use the Mahalanobis distance measure, which adjusts for high correlation. The other is to apply factor analysis and use the resultant uncorrelated factor scores for each observation as the basis for clustering. The latter procedure was followed.

The variables for the factor analysis were selected by both a review of previous studies (Chaplin, 2003) and a simple two-product model derived from Fraser (1990). The logic of the latter is that an individual, company or household may allocate their resources (in this case, labour) to two potential activities, one agricultural and the other non-agricultural. Only the agricultural activity is assumed to have an uncertain net return. The objective function of the household is to maximise the utility of expected net returns by altering labour allocation. Thus, allocation is dependent on the variances of expected returns from the two activities and the magnitude of these returns. A set of variables were tested with this model by changing the variables one at a time and recording the effects of the changes on expected utility as well as the necessary adjustments to time allocations in order to satisfy the maximisation objective. Thus, the potential effects of a variety of variables on diversification were tested. The list was then refined through discussion with local experts in order to assess their appropriateness in the Polish context.

In conducting the factor analysis, the method of principal component analysis with varimax rotation was adopted. This method assures that the obtained factors are orthogonal and, thus, avoids the problem of multicollinearity. In undertaking factor analysis, one of the main issues is to define how many factors are appropriate in summarising the data. In this case, factors presenting an eigenvalue, which represents the amount of variance accounted for by a factor, of greater than one were chosen. The cut-off applied for interpretation purposes were factor loadings greater or equal to 0.5 on at least one factor. These factor loadings represent the correlation coefficients between a variable and a factor.

Two tests were applied to assess the validity of factor analysis. The Kaiser-Meyer-Olkim (KMO) measure of sampling adequacy was employed in order to define whether the data matrix has sufficient correlation to justify the application of factor analysis. Bartlett's test of sphericity was used to account for the significance of the correlation matrix in order to reject the hypothesis that the correlation matrix is the identity matrix.

The factors formed the basis of the cluster analysis, which followed a two stage hierarchical approach. First, Ward's method, a hierarchical technique, was used to identify outliers and profile the cluster centres. The number of clusters was determined using dendrograms, vertical icicle diagrams and agglomeration coefficients. (Hair *et al.*, 1998). Then, the observations were clustered by a non-hierarchical method with the cluster centres from the hierarchical results used as the initial seed points. This combined procedure allows one to benefit from the advantages associated with hierarchical and non-hierarchical methods, while at the same time minimising the drawbacks (Punj and Stewart, 1983).

Two sets of factor and cluster analysis were employed: one for studying the impediments to non-agricultural enterprise creation (cluster analysis A), and the other, for constraints to off-farm employment (cluster analysis B). The results of cluster analyses A and B are described in turn in Section 5.

4.   Data set and characteristics of the surveyed regions

The analysis is based on primary survey work with data collected by field level enumerators. Altogether, 342 farm households were surveyed in three regions that were selected by local experts with the aim of capturing contrasting rural environments. Since IERiGZ regularly conduct a "farm and family" survey, which has some overlap with the issues dealt with in this study, farm households sampled for the "farm and family" were resurveyed, eliciting only data that was not collected in the IERiGZ survey. Therefore, the existing sample from the "farm and family" survey of IERiGZ was utilised, which covers two villages in each selected region. Every farm household in these villages was surveyed for this study in 2001.

The questionnaire gathered information on household, farm and regional characteristics. Total annual household income was measured through the use of income bands. These bands were constructed on the basis of national farm household income. The lowest band represented the incomes of the lowest 25 percent (equivalent to less than US$ 1,572 per annum), the second 25-50 percent and so on.

The three selected regions were Podkarpackie, Dolnoslaskie and Podlaskie. These are voivodships (comparable to NUTS II), located in differing macroregions, therefore, collectively

capturing the main regional variations. *Podkarpackie* is in the south-east of Poland in Macroregion I. It has twice the average population density of rural Poland. Most of the farms in the region are small and farmers generally have to combine agriculture with non-agricultural gainful activities.

Dolnoslaskie is in the south of the country bordering the Czech Republic, in Macroregion II. The region has high unemployment, rural depopulation, a declining food processing sector and an expanding area of uncultivated land. In the two villages from the region, which were surveyed, 30 percent of the population have off-farm employment (Milczarek, 2002).

Podlaskie is located in the east of the country in Macroregion III. The average standard of living is below the national average and the region is also characterised by a low population density and rural depopulation. The local economy is predominately agricultural. A low proportion of the population in the two surveyed villages (9 percent and 5 percent respectively) held employment outside agriculture (Milczarek, 2002).

The sample contains 342 farm households. The farms in the sample are small, with an average area of 10 ha (areas ranged between 0.7 – 80 ha). Most farms in the sample fall into one of two groups: between 2 and 5 ha and over 15 ha. In comparison to the agricultural census, the mean farm size in the sample is larger with fewer farms in the smallest size groups (less than 5 ha). As the sample is based on bookkeeping records the exclusion of the smallest producers, many of whom do not produce for the market, is inevitable. While recognising this, the under-representation of purely subsistence producers should be borne in mind in the interpretation of the results.

From the overall sample, a sub-sample of 150 households, which were not engaged in any form of diversification, answered additional questions in the survey relating to their reasons for not diversifying. Non-diversifying respondents rated potential constraints on a scale of 1-5, with 1 indicating low, and 5, high importance. In a similar manner, respondents assessed possible changes in agricultural policy (such as the introduction of direct payments) and potential measures to encourage enterprise and employment diversification (such as the availability of seed money for business start-up) in terms of their potential impact on their propensity to diversify.

Although the focus of this study is on non-diversifiers, a comparison with diversifiers helps identify the differences between the two and distinguish characteristics that enable or prevent diversification (Table 1). Some of the main differences between the two groups are: diversifiers have smaller farms, are less likely to use agricultural extension agencies, have younger heads of household, enjoy more frequent and closer public transport, and have more children than non-diversifiers. In terms of financial well-being, diversifiers have higher incomes and are more likely to own a car. Table 1 also highlights some regional differences, e.g. Podkarpackie, where the farms are the smallest, has a greater incidence of diversification (mostly off-farm employment) than in the other two voivodships. However, while there are some broad differences between diversifiers and non-diversifiers, the latter group is characterised by a diverse set of reasons for not diversifying and these are explored in Section 5.

Table 1 Descriptive statistics for diversified and non-diversified Polish farm households

	Non-diversifiers		Diversifiers	
Variable	Mean	Standard Deviation	Mean	Standard Deviation
Farm area (ha)	12.3	9.9	8.2	10.9
Distance to public transport (km)	0.6	0.4	0.4	0.4
Frequency of public transport (per week)	20.0	16.0	33.0	17.0
Time allocated to farm work by the head of household (hours per week)	37.5	18.6	23.5	19.2
Unearned income (US$ per year)	1985.0	1578.0	1724.0	1552.0
Number of children	1.1	1.2	1.9	1.4
Age of head of household (years)	50.8	13.2	44.4	10.4

	Frequency	% of sample	Frequency	% of sample
Dolnosląskie	47	31.3	31	16.3
Podkarpackie	39	26.0	114	60
Podlaskie	64	42.7	45	23.7
Income per year <US$ 1,572	11	7.3	0	0
US$ 1,572-3,929	70	46.7	22	11.6
US$3,929-6,548	46	30.7	63	33.2
>US$6,548	23	15.3	105	55.3
Declining standard of living 1990-2001	99	66.0	91	47.9
Use agricultural extension	24	16.0	15	7.9
Car ownership	78	52.0	143	75.2

5. Results

Two sets of factor and cluster analysis were conducted. The first focused on the barriers to enterprise diversification (analysis A (Table 2)) and the second, to employment diversification (analysis B (Table 6)). For both sets, the tests performed (KMO and Bartlett's) indicated that the sample was appropriate for the application of factor analysis.

Table 2: Factor analysis for the constraints to enterprise creation*

	Factor 1	Factor 2	Factor 3
Sufficient income gained from agriculture	-0.280	0.446	0.462
Insecure property rights	0.038	0.424	0.044
Risk of non-agricultural investment	**0.547**	0.479	0.162
Lack of demand	0.460	**0.755**	-0.116
Too many local competitors	0.381	**0.694**	-0.284
Insufficient knowledge and skills	**0.737**	-0.224	-0.041
Remoteness	-0.097	**0.849**	0.112
Prefer to concentrate on agriculture	-0.284	0.014	**0.782**
Age	-0.103	0.259	**-0.608**
Lack of time	-0.127	0.282	**0.727**
Unpredictable interest rates	**0.729**	0.224	-0.307
Insufficient capital	**0.859**	0.0980	0.065
High inflation	**0.807**	0.049	-0.317
Lack of credit	**0.794**	0.259	-0.178
Variance explained (69%)	33.89	18.11	10.29

*Factor loadings above 0.5 in bold.

Cluster Analysis A: Farm households without diversified enterprises

The barriers to the creation of non-agricultural enterprises that were considered in the survey are presented in Table 3. This includes variables that have been identified as important in other studies, such as age and insufficient local demand, and also encompasses features that characterised Poland during transition, e.g. unpredictable interest rates, lack of credit and high inflation. Following the approach explained in the methodology, i.e. eigenvalues above 1, a three-factor solution was adopted. The three factors explained 69 percent of the total variance of the variables in the data set, which is satisfactory. As stated earlier, a cut-off point of 0.5 for the interpretation of factor loadings was used. The first factor is related to financial constraints and inadequate human capital. It represents insufficient capital, lack of credit, insufficient skills and unpredictable interest rates. The second factor could be labelled *location*, which is related to remoteness, lack of demand and too many local competitors. The third factor is related to age and a preference to concentrate on agriculture (Table 2).

Using these factors as a basis for the cluster analysis, a four-cluster solution was adopted. To profile and validate the clusters, each is assessed in terms of key defining variables (household characteristics and public transport availability) that were not included as variables used to derive the clusters. This is a part of the validation process, as this helps to evaluate whether the derived clusters are meaningful (Ketchen and Shook, 1996). Table 4 presents the mean values for these variables by cluster as well as the mean for the sample. Differences across clusters are significant for all variables presented in Table 4 at a 1 percent level of significance. In order to provide a more detailed picture, Table 5 profiles cluster membership by region and income characteristics. The main characteristics of each cluster are presented below.

Cluster A1

This cluster consists of 42 households that are located in Podlaskie and Dolnosląskie. In terms of constraints to enterprise diversification this cluster rates the desire to concentrate on agriculture and a lack of time as most important. A high score is also attached to insufficient knowledge and skills, despite this cluster registering the highest mean level of general education.

The farms of Cluster A1 are above the sample average in size (15.4 ha) but according to the time the head of the household devotes to agriculture they are similar to the sample mean. This cluster records the highest use of agricultural extension (31 percent), which is indicative of a focus on agricultural production and their preference to specialise in farming. This is reflected in their ability to achieve higher yields than the other clusters for most crops. For example, they obtain a potato yield 27 per cent higher than Cluster A3 and sugar beet yields, 7 times greater than those in Cluster A2. Mobility is not a problem and this cluster attaches the lowest mean score to the problem of remoteness. This might be related to the fact that over three-quarters of the cluster owns a car. The age and income structure of the cluster are favourable: the mean age of the head of the household is the lowest out of the four clusters and over half of the cluster earn in excess of € 6,827. This cluster can be categorised as *well educated, agriculturally focused households*.

Cluster A2

This cluster consists of 21 households for whom the main barrier to enterprise diversification is their age. The average age of the head of the household in this cluster is 61, significantly above the mean for the other three clusters. This cluster is indicative of one of the main demographic problems in rural Poland where a high proportion of the population are pensioners. Apart from age, insufficient knowledge and skills, and a preference for agriculture are also seen as barriers. Assessing the productivity of their farms, the yields of both crops and livestock in this cluster are below the sample average and for most products are the lowest of any group. This may well be related to age as this tends to affect productivity (Rizov *et al.* 2001). The majority of households earn less than €4,096. This cluster can be labelled *elderly households*.

Cluster A3

The third cluster is composed entirely of farm households from Podlaskie voivodship (17 households in total). It incorporates the largest farms with an average area of 25.8 ha. The cluster is also relatively prosperous with nearly 53 percent earning in excess of €6,827and none of the households in this cluster are in the lowest income band.

Regarding barriers to diversification, the highest mean scores are attached to remoteness, lack of capital and credit, and sufficient income being derived from agriculture. Relatively large distances to, and a low frequency of, public transport echo the high rating given to remoteness as a barrier to enterprise diversification. Further problems caused by their location are too many local competitors and a lack of demand, both of which indicate a problem of sparsely populated rural economies with low purchasing power, which act against non-agricultural investment. Larger farms also consume more time and the allocation of labour to these farms is much greater than for the other clusters. The latter is influenced not only by the size of the farms but also by the farm enterprise mix which points towards labour intensive farming. These are specialised dairy farms with an average herd size of 17 cattle, the largest with a herd of 40, which is above those of the other clusters. This cluster can be labelled as *remote, relatively large peasant farms.*

Cluster A4

This cluster has 56 members, most of which are based in Podkarpackie and incorporates the smallest farms in the sample (cluster mean of 7 ha). It records the highest level of unearned income per annum and most households are located in the lower income bands. Less than 2 percent have used

agricultural extension services and the majority of households do not own a car. The main constraints to enterprise diversification are a lack of human and physical capital (high scores for insufficient knowledge and skills, insufficient capital and lack of credit). This cluster does not consider that they earn enough income from agriculture and wish to develop alternative income streams. Cluster A4 has the highest allocation of farm labour per hectare, which suggests a lower level of mechanisation, and hence of investment in agriculture, and also a degree of underemployment. However, the higher level of labour intensity does provide the benefit of bolstering the yields of this cluster which are, in consequence, above average. This cluster can be labelled *poor, small farms with a low endowment of human and physical capital*.

Reviewing the analysis, only members of Cluster A4 (41 percent of the sample) are likely to be receptive to policies aimed at encouraging enterprise diversification. This is because Cluster A1 indicate a desire to concentrate on agriculture, Cluster A2 perceive themselves as being too old and Cluster A3 are stymied by their location and lack of a market, coupled with sufficiently high agricultural incomes to limit the need to diversify. Households in Cluster A4, on the other hand, have a limited potential to earn sufficient income from their farms due to their small size. The high level of unearned income is a result not only of pensions, but also of a high proportion of disability benefit. Within the Polish context, which has an extremely high proportion of persons receiving disability benefit, this does not necessarily mean that they are actually disabled. In fact, a World Bank survey indicated that amongst the population of working age, 42 percent more receive disability benefit than say they are disabled (Andrews, 2002). Unemployment benefit is paid only for a limited period, while disability benefit is paid indefinitely so that the latter may be viewed as a preferable alternative. More importantly, however, is that these households are in need of additional income and it would be beneficial if they were able to diversify.

Table 3: Cluster analysis of constraints to enterprise creation (mean ratings)

	Cluster A1	Cluster A2	Cluster A3	Cluster A4	Mean
Sufficient income gained from agriculture	2.2	1.6	3.5	1.1	1.8
Insecure property rights	1.1	1.1	1.2	1.1	1.1
Risk of non-agricultural investment	2.2	1.7	3.4	2.9	2.6
Lack of demand	1.1	1.4	3.2	2.3	1.9
Too many local competitors	1.3	1.8	3.9	2.3	2.3
Insufficient knowledge and skills	3.5	2.1	3.0	4.4	3.6
Remoteness	1.3	1.7	4.8	1.5	1.9
Prefer to concentrate on agriculture	3.9	2.0	2.9	1.3	2.4
Age	2.0	4.0	3.4	3.1	3.0
Lack of time	3.8	2.0	3.8	1.9	2.7
Unpredictable interest rates	1.3	1.1	2.0	2.8	2.0
Insufficient capital	3.0	1.8	3.9	4.3	3.4
High inflation	1.4	1.4	1.7	3.0	2.1
Lack of credit	2.1	1.4	3.9	4.0	3.0

Table 4: Household characteristics and transport provision by cluster for the constraints to enterprise creation (mean values)

	Cluster A1	Cluster A2	Cluster A3	Cluster A4	Mean	F-test
Cluster membership (number)	42	21	17	56		
Farm area (ha)	15.4	10.6	25.8	7.0	12.5	25.23***
Time allocated to farm work by the head of household (hours per week)	37.7	32.6	61.1	31.2	37.2	15.86***
Age of the head of household	47.5	60.9	50.1	51.1	51.3	5.68***
Level of general education of the head of household	2.7	2.4	2.1	2.5	2.5	5.89***
Unearned income (US$ per year)	1,424	2,067	1,671	2,488	1,993	4.16***
Distance to public transport (km)	0.5	0.6	0.9	0.5	0.6	5.22***
Frequency of public transport (per week)	10.3	14.1	12.4	34.1	20.9	33.80***
Number of children	1.6	0.29	1.6	0.89	1.1	7.95***

Where* indicates the 0.1 level of significance, ** the 0.05 level and *** the 0.01 level.

Table 5: Socio-economic and spatial characteristics of households per cluster for the constraints to enterprise creation (% of cluster members)

Cluster	Cluster A1	Cluster A2	Cluster A3	Cluster A4
Dolnosląskie	54.8	61.9	0.0	19.6
Podlaskie	45.2	23.8	100.0	16.1
Podkarpackie	0.0	14.3	0.0	64.3
Car ownership	76.2	19.0	82.4	39.3
Income per year <€ 1,638	4.8	9.5	0.0	10.7
Income €1,638-4,096	40.5	61.9	23.5	51.8
Income €4,096-6,827	26.2	28.6	23.5	33.9
Income >€6,827	28.6	0.0	52.9	3.6
Declining standard of living 1990-2001	42.9	76.2	94.1	80.4

Cluster Analysis B: Farm households without off-farm employment

From the factor analysis based on the variables concerning barriers to off-farm employment, presented in Table 6, a three-factor solution was adopted (factor loadings above 0.5 are indicated in bold). This solution explains 65.2 percent of the total variance of the variables in the data set. The first factor is related to poor returns to non-agricultural labour (high loadings for lower relative income in the non-agricultural sector and delayed payment of wages) and remoteness. The second factor is related to low human capital (insufficient knowledge and skills) and a lack of local opportunities (higher regional unemployment and job insecurity). The third factor is associated with a desire to specialise in agriculture and age / time constraints.

Using these factor scores as a basis for cluster analysis, a four-cluster solution was obtained. Table 8 presents the mean values of household characteristics and the supply of public transport services by cluster. Differences between clusters on all these variables are significant at the 1 percent level. To enhance the description, Table 9 details the socio-economic and spatial characteristics of each cluster.

Cluster B1

This cluster has 57 members (41.6 percent of the sample) who almost exactly match those in Cluster A4 in the previous analysis. The main barriers to taking up off-farm employment are perceived to be high regional unemployment, insufficient knowledge and skills, and job insecurity. None feel that they earn sufficient income from agriculture for it to be a major barrier to employment

diversification. Similarly, few report that non-agricultural wages are below those that they receive from farming activities. These households are mostly located in Podkarpackie, have small farms (mean 7.2 ha) and typify low-income peasant households that generate insufficient returns. Most earn less than €4,096 per year, of which unearned income makes up over half (mean of €2,492). Remoteness, insufficient public transport and lack of time are not perceived as major barriers. The members of this cluster also have the advantage of being served by a dense public transport network which would facilitate travel to off-farm employment if they were able to obtain jobs. This cluster can be labelled *poor, small farms with a low endowment of human capital.*

Cluster B2

The second cluster is comprised of 42 farm households (from Dolnosląskie and Podlaskie) who match those in Cluster A1 in the analysis of barriers to enterprise diversification. The main reasons for not taking up off-farm employment are a strong preference for farming and high regional unemployment. Just over 40 percent report a declining standard of living, which is much lower than in all other clusters and most households fall into the two higher income bands. However, the mean farm size is still small by international terms (15.9 ha) although above the national average. The level of general and agricultural education of the head of the household is above average with a strong desire to concentrate on farming. Interestingly, lack of knowledge and skills is not considered to be an important constraint for off-farm employment. However, when considering enterprise diversification, Cluster A1 considered a lack of knowledge and skills to be important despite their relatively high level of education. This suggests that their existing knowledge and skills are perceived to be more appropriate to employment diversification than the creation of non-agricultural businesses. This cluster can be labelled as *agriculturally focused well-educated households.*

Cluster B3

This cluster is comprised of 20 farm households for whom the overriding constraint is age. The average age of cluster B3 is 63 and this group includes most of the households profiled in Cluster A2. Their income levels are relatively low; three quarters are in the bottom two income bands and a high proportion of income comes from pensions. Only 5 percent have used agricultural extension services and 15 percent own a car. It is unlikely that this cluster will enter the non-agricultural job market and can be described as *elderly households.*

Cluster B4

This cluster has 18 members, all of whom are located in Podlaskie. The main constraint for these households is perceived to be location, which is reflected in high mean scores for the problems of remoteness, high regional unemployment, job insecurity and insufficient public transport. Further constraints are identified as age and a lack of time. The latter is consistent with the high number of hours devoted to farm work by the head of the household as a result of poor non-agricultural opportunities and their larger farms (an average area of 25.3 ha). Furthermore, as these are dairy farms, the requirement of milking at least twice a day restricts the ability to hold off-farm work. Although this cluster has virtually the same composition as Cluster A3 from the analysis of non-agricultural enterprises, sufficient income being derived from agriculture is not perceived to be a constraint to off-farm employment, while it is for starting a diversified enterprise. This suggests a degree of inconsistency or that the investment and effort involved in starting an enterprise outweighs the utility that may be gained from the additional income generated. Overall, 50 percent of Cluster B4 are in the highest income band although nearly 90 percent report a declining standard of living. This cluster can be labelled as *remote, relatively large peasant farms.*

In summary, the main constraint to employment diversification is perceived to be high regional unemployment, followed by age. Remoteness and a lack of time due to their larger farms impede members of Cluster B4. Cluster B3 is elderly and Cluster B2 registers a high preference to concentrate on agriculture. These three clusters collectively account for just less than 60 percent of the sample. Only members of Cluster B1 are clearly motivated, and to an extent able, to pursue off-farm employment but they suffer from a lack of knowledge and skills. The clusters based on barriers to employment diversification resemble very closely those derived from constraints to enterprise diversification.

Several agricultural policies were indicated by non-diversifiers, both for enterprise and off-farm employment, as having a negative effect on the propensity to diversify. These were output price stabilisation, direct payments, investment subsidies, tax exemptions for the agriculture sector and

credit subsidies for farming. This is because the respondents view diversification as a tool to smooth income and counterbalance unstable returns to agriculture, or to augment their income. As such, policies that increase agricultural price support will lower the propensity to diversify and *vice versa* (Chaplin *et al.*, 2004). Therefore, the instruments of the EU Common Agricultural Policy (CAP) implemented in the New Member States, particularly the introduction of direct payments, will thus impact on future patterns of diversification.

Respondents' assessments of the likelihood of a set of possible policy measures increasing their propensity to diversify are detailed in Table 10. The highest mean scores for most policy measures are recorded by Clusters A4 and B1, indicating that they are most likely to respond to such initiatives. This is consistent with the fact that these groups are the most interested in diversification. In contrast, Clusters A2 and B3 (elderly households) indicate that are extremely unlikely to respond to any of the proposed policies. Clusters A3 and B4 (larger, remote farms) also indicate they are unlikely to take-up support for enterprise diversification but are relatively more interested in seasonal employment.

Analyzing policies that would be of use to those that are most willing to diversify (Clusters A4 and B1), it is clear that financial measures (such as the availability of seed money for business start-up and low cost finance) and information (on public sector assistance, business training and planning etc.) are deemed the most useful. This is consistent with the most important barriers to diversification which were identified by these clusters (lack of human and physical capital). Relatively little weight is given to sharing knowledge and expertise with other farmers or improvements in market and physical infrastructure. This would suggest that any policy support initiatives to encourage enterprise diversification should focus on linking advice on business planning and management with financial measures. Such an approach would be more line with the needs of potential diversifiers than attempts to set up learning groups of farmers or co-operative networks, which has formed the basis of some rural development initiatives in Western Europe (Lowe *et al.*, 1998).

Table 6: Factor analysis for the constraints to off-farm employment*

	Factor 1	Factor 2	Factor 3
Sufficient income gained from agriculture	0.361	-0.188	**0.568**
Insufficient public transport	**0.865**	0.025	0.108
Insufficient knowledge and skills	-0.178	**0.646**	-0.367
Remoteness	**0.790**	0.199	0.121
Prefer to concentrate on agriculture	0.069	-0.290	**0.730**
Age	0.252	-0.114	**-0.614**
Lack of time	0.293	0.027	**0.735**
High regional unemployment	0.047	**0.875**	0.115
Job insecurity	0.376	**0.787**	-0.132
Delayed payments of wages	**0.849**	0.103	0.012
Non-agricultural income below agricultural	**0.804**	0.103	0.10
Variance explained (65.2%)	29.1	18.1	17.9

* Factor loadings above 0.5 in bold.

Table 7: Cluster analysis of constraints to off-farm employment (mean ratings)

	Cluster B1	Cluster B2	Cluster B3	Cluster B4	Mean
Sufficient income gained from agriculture	1.2	2.1	1.3	2.9	1.7
Insufficient public transport	1.1	1.1	1.1	3.4	1.4
Insufficient knowledge and skills	4.2	2.6	2.5	2.8	3.3
Remoteness	1.5	1.1	1.6	4.4	1.8
Prefer to concentrate on agriculture	1.3	4.0	2.2	2.8	2.5
Age	3.3	1.9	4.2	3.5	3.0
Lack of time	1.9	3.8	1.6	4.0	2.7
High regional unemployment	4.9	4.0	1.8	4.6	4.2
Job insecurity	3.9	1.7	1.2	4.6	2.9
Delayed payment of wages	1.2	1.0	1.1	2.7	1.3
Non-agricultural below agricultural income	1.0	1.1	1.1	2.3	1.2

Table 8: Household characteristics and transport provision by cluster for the constraints to off-farm employment (mean values)

	Cluster B1	Cluster B2	Cluster B3	Cluster B4	Mean	F-test
Cluster membership (number)	57	42	20	18		
Farm area (ha)	7.2	15.9	9.4	25.3	12.6	26.49***
Time allocated to farm work by the head of household (hours per week)	32.7	37.7	29.8	64.0	37.9	21.59***
Age of the head of household (years)	50.7	47.1	63.2	47.8	51.0	8.95***
Level of general education of the head of household	2.5	2.7	2.4	2.2	2.5	5.98***
Unearned income (US$ per year)	2,389	1,508	2,228	1,449	1,972	3.72***
Distance to public transport (km)	0.46	0.51	0.44	0.99	0.54	9.404***
Frequency of public transport (per week)	33.1	10.3	14.4	12.3	20.7	30.78***
Number of children	0.86	1.6	0.2	1.6	1.1	8.84***

Where* indicates the 0.1 level of significance, ** the 0.05 level and *** the 0.01 level.

Table 9: Socio-economic and spatial characteristics of households per cluster for the constraints to off-farm employment (% of cluster members)

	Cluster B1	Cluster B2	Cluster B3	Cluster B4
Dolnosląskie	21.1	52.4	65.0	0.0
Podlaskie	17.5	47.6	20.0	100.0
Podkarpackie	71.4	0.0	15.0	0.0
Car ownership	40.4	76.2	15.0	77.8
Income per year < € 1,638	10.5	4.8	10.0	0.0
Income €1,638-4,096	52.6	40.5	65.0	27.8
Income €4,096-6,827	33.3	26.2	25.0	22.2
Income > €6,827	3.5	28.6	0.0	50.0
Declining standard of living 1990-2001	80.7	40.5	70.0	88.9

Table 10: Rating of policy initiatives, which can increase households' propensity to diversify (max 5, min 1)

	Mean for sample	Clusters based on constraints to enterprise diversification				Clusters based on constraints to employment diversification			
		A1	A2	A3	A4	B1	B2	B3	B4
Policy measure									
Seed money for business start-up	3.0	2.4	1.3	3.0	4.0	4.0	2.4	1.5	3.0
Availability of low cost finance	2.8	1.9	1.4	2.9	4.0	3.9	1.9	1.6	2.9
Guarantees for loans	2.8	2.2	1.3	2.7	3.8	3.8	2.2	1.4	2.7
Tax exemptions for diversified enterprises	2.7	1.8	1.4	2.3	3.8	3.8	1.8	1.6	2.3
Better information on public sector assistance	2.5	1.8	1.0	1.6	3.9	3.8	1.8	1.2	1.6
Business training or education	2.4	1.3	1.4	2.6	3.6	3.5	1.3	1.5	2.6
Advice on completing loan or grant application forms	2.1	1.0	1.1	1.6	3.3	3.3	1.0	1.3	1.6
Advice on business planning	2.0	1.5	1.1	1.4	3.0	3.0	1.5	1.2	1.4
More skilled or trained local workforce	1.5	1.0	1.0	1.6	2.0	1.9	1.0	1.1	1.6
Sharing of knowledge and experience by other farmers	1.8	1.6	1.0	1.5	2.4	2.3	1.6	1.0	1.5
Improved market infrastructure	1.6	1.2	1.2	2.0	1.8	1.8	1.2	1.3	2.0
Improved physical infrastructure	1.3	1.0	1.1	1.5	1.5	1.5	1.0	1.1	1.5
Availability of seasonal employment	2.2	1.6	1.6	3.1	2.6	2.6	1.6	1.7	3.1
Availability of jobs with hours to suit	2.1	1.6	1.5	2.5	2.6	2.5	1.6	1.5	2.5
Benefits with off-farm employment	2.0	2.0	1.5	1.3	2.3	2.3	2.0	1.5	1.3

6.Conclusions

Polish farm households form distinct groups with regard to their reasons for not pursuing enterprise and employment diversification. An analysis of these groups provides useful information for understanding the potential for, and limitations of, diversification strategies. The majority of Polish farm households that are currently not diversified are unlikely to engage in creating new non-agricultural businesses or to take up off-farm employment. There is a mixture of reasons for this. For about 15 percent of the sample, age is the most important barrier (Clusters A2 and B3). These groups have a mean age of above 60 and they are unlikely to re-enter the labour market or create new businesses. The persistence of large numbers of pensioners' farms has been recognised by the Polish government as an impediment to structural change and in 2001, a new law was introduced that incorporated incentives for farmers to give up farming for early retirement (IERiGZ, 2002).

For approximately 30 percent of the sample a desire to concentrate on farming predominates (Clusters A1 and B2). This may seem counterintuitive given the relatively low level of farm returns in Poland. However, the desire to concentrate on farming has been influenced by trends that have been witnessed in most CEECs since the early 1990s. First, the transition process brought about unemployment; agriculture acted as a social buffer for individuals who had been made redundant and many returned to their family farms. Second, in anticipation of the implementation of the CAP, some farmers focused their efforts on augmenting their yields and output in order to take better advantage of the CAP market support and direct payments. The households who would like to concentrate on farming are characterised by possessing farms that are larger than average (albeit small by Western European or North American standards) and which achieve higher yields (Cluster A1). This implies a higher farm income and the possibility to maintain the family's standard of living through farming.

For both the groups of elderly farmers and those focused on agriculture, initiatives to encourage diversification are unlikely to have an impact. However it should be remembered that, as the sample is biased towards larger farms, it can be assumed that the group of farmers which is in need of supplementing their farm incomes is relatively larger than that recorded in the present study.

The final group consists of farm households who are poorer, have small farms and are predominantly located in Podkarpackie (Clusters A4 and B1). These households are far more interested in diversification and are more likely to react to policy initiatives that can overcome their barriers to diversification (a lack of physical and human capital). Assessing the measures that would be of value to this group for encouraging enterprise diversification indicates that any business training and advice needs to be linked to unlocking external capital for it to be successful. A model of business support that helps households develop a realistic business plan coupled with identifying and helping access external finance appears most appropriate.

Considering the implications of accession to the European Union, the concentration of rural policy on agricultural measures and the open possibility to transfer rural development funds to direct payments will hinder diversification of the rural economy and is unlikely to help those in the worst financial situation. As households that are most in need of additional income possess only small farms, which generate inadequate revenues, they will receive only small payment streams. On the other hand, those with larger farms who are less at risk of poverty will do better from the introduction of direct payments (Guba, 2002). This implies a mismatch between the level of agricultural policy support received and those most in need of augmenting their incomes. In this regard a weakness of West European rural policy is being imported to Poland. There is a lack of focus on those groups that are most in need, the barriers they face to augmenting their incomes and initiatives which could overcome such impediments.

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