Which characteristics of workers are important for employers in Northeast Germany?

Které charakteristiky pracovníků jsou důležité pro zaměstnavatele na severovýchodě Německa?

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Abstract: The purpose of this study is to investigate the significance of different characteristics and competencies possessed by agricultural workers on the basis of assessment through agricultural managers in the German state of Mecklenburg-Western Pomerania. Bivariate analysis should uncover relationships between farm attributes and the respective requirement profile. Using the elicitation technique approach, an open question was submitted to farms. Respondents were asked to name the important characteristics concerning agricultural workers. Frequency and order of mentions were used to identify the relevant characteristics. Specialised knowledge was seen as the most important characteristic of an employee, followed by the general interest in the vocation. A dominance of generic attributes was observed. There was a statistically significant positive relationship between the farm acreage and the importance of vocational characteristics. The more distinctive division of labour and specialisation in more large-scale farms can be seen as the reason for this occurrence.

Key words: labour force, characteristics, competencies, elicitation technique, Mecklenburg-Western Pomerania

Abstrakt: Cílem této studie je zkoumat významnost jednotlivých charakteristik a kompetencí zemědělských pracovníků na základě jejich hodnocení manažery zemědělských podniků v německé spolkové zemi Meklenbursko-Západní Pomořansko. Bivariantní analýza by měla odhalit vztahy mezi charakteristikami farmy a příslušným požadovaným profilem pracovníka. S využitím elicitační techniky byla farmám položena otevřená otázka. Respondenti byli požádáni, aby vyjmenovali důležité charakteristiky pracovníků v zemědělství. Četnost a pořadí odpovědí byly použity pro identifikaci relevantních charakteristik. Jako nejdůležitější charakteristika byly vyhodnoceny specializované znalosti, následované všeobecným zájmem o profesi. Byla zjištěna dominance generických atributů. Dále byl shledán signifikantní pozitivní vztah mezi výměrou farmy a významem odborných charakteristik. Za příčinu tohoto jevu lze považovat vyšší úroveň dělby práce a specializace na farmách s větší výměrou.

Klíčová slova: pracovní síly, charakteristika, kompetence, elicitační technika, Meklenbursko-Západní Pomořansko

Global, national and regional trends cause rising qualification requirements for certain occupations. In this context, the agricultural sector is a field of work with a modern occupational profile as well as high requirements concerning workforce. Employers still demand a vocational training which is in step with the actual practice (Fock et al. 1998). Real requirements which agricultural employers are looking for are insufficiently investigated – at least for the case of the Northeast Germany.

In the area under study – the German state of Mecklenburg-Western Pomerania – 88% of the agricultural workforce is employed by an agricultural company. Self-employed farmers and family labour account for only 3 400 workplaces, while there are 25 500 employed farmers. This is one of the highest rates in Germany. For example this rate is only 25.8% in Bavaria (Statistisches Amt 2008) – Figure 1.

The analysis of preferences on the agricultural production level concerning agricultural workers is an essential input for institutions of agricultural education and extension. Education which fits the demand of agricultural production guarantees the continuing high competitiveness of German agriculture (Bundesregierung 2007).

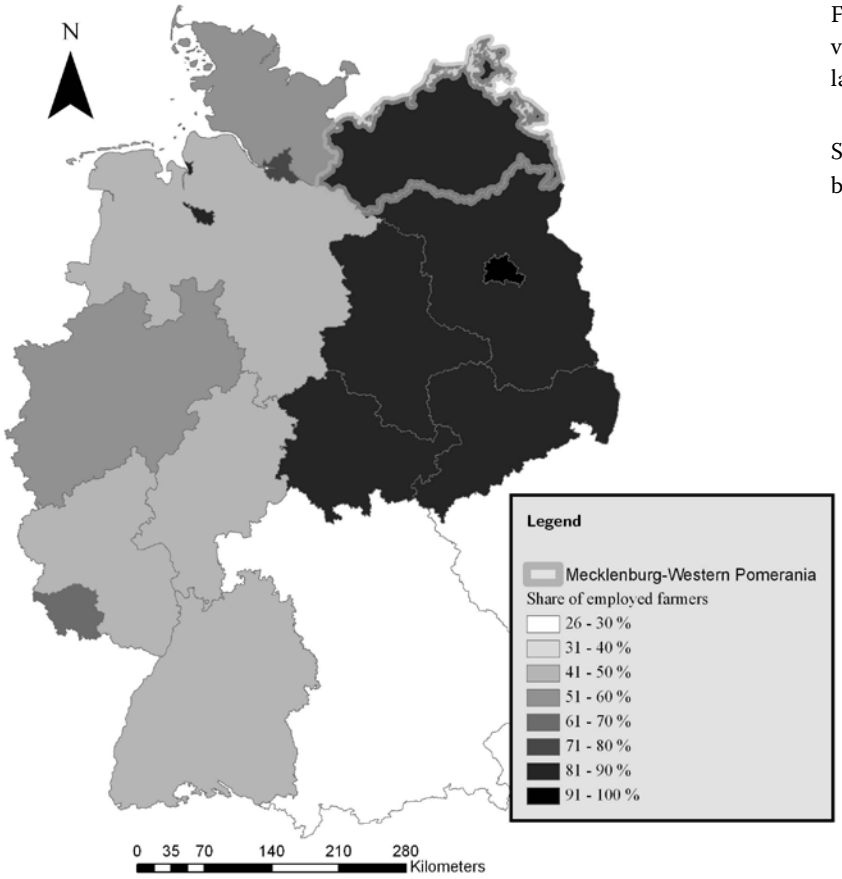

Figure 1. The share of employed farmers vs. self-employed farmers and family labour in the German states

Source: compiled by the author on the basis of the Statistisches Amt (2008)

The aim of this study is to investigate the significance of different characteristics and competencies of agricultural workers on the basis of the assessment through agricultural managers in the German state of Mecklenburg-Western Pomerania. In this respect, a distinction between the generic and vocational characteristics will be made. This distinction can be seen as a standard in the literature (e.g. Heijke et al. 2003; Biesma et al. 2008), though some authors conduct more differentiated distinctions (e.g. Stasz 2001).

Generic competencies are mainly non-specialised qualifications and they are often referred to as key qualifications. The examples are independence, problem identification ability, problem solving, decision making, strategic/analytical thinking, communication skills, innovation and leading competencies (Mulcahy and James 2000). Generic abilities can be applied in various companies and economic sectors. In contrast, vocational competencies are in most cases the specialised abilities for the respective field of work. In agricultural production, the classic vocational competencies would be e.g. the skilled handling of farm animals or the trained deployment of pesticides.

The definitions of "competence" are not consistent within the current literature. The reason is that competencies play roles in different science disciplines. Van Loo and Semeijn (2004) distinguish three different perspectives concerning the meaning of competence: the educational perspective, the labour market perspective and the human resource perspective. The differences in the meaning of the term result from the existence of these different views. Furthermore, the distinction between the terms like "competence", "ability" and "qualification" are not always clear-cut. In the context of this study, these terms should be used synonymously.

In the hitherto existing research, the view of employers on academically educated employees were mainly investigated (see e.g. Vreyens and Shaker 2005; Alibeigi and Zarafshani 2006; Navarro 2006; Norwood and Henneberry 2006; Robinson 2006; Juracak and Karpati 2008; Snyder 2008 etc.). Recent research predominately focus on productivity issues (Onumah et al. 2010) or coping with aging workers (Spěšná et al. 2009). The perspective of agricultural employees who have not necessarily an academic background, that is who mainly work in the initial production, have been neglected. Nevertheless, there are accordant studies (see e.g. Hansen et al. 1989; Radhakrishnaand and Bruening 1994; Floyd and Gordon 1998; Kitchen et al. 2002; Kreyßig et al. 2007; Martin et al. 2008; Ricard et al. 2008). The deficit of these studies is that they mainly deal with agribusiness as a whole rather than focussing specifically on the level of agricultural pro-

duction. With the exception of Kreyßig et al. (2007), the perspectives of German employers in agriculture were neglected. This study shall be understood as a contribution to fill in this gap.

MATERIAL AND METHODS

Via the elicitation technique, the important competencies of employees in the agricultural sector were identified. This method is a direct and open approach in order to investigate the potentially relevant characteristics. It is important to note that not the original form of the elicitation technique was used, but a modification of the advancement of Steiner (2007) with the name EVAS (Evoked set based Attribute Selection Technique). The crucial advancement was the adjustment of the traditional elicitation technique. The EVAS method was modified for the purposes of this study.

The advantage of this method is that the answers of respondents are more likely to reflect their real assessment process. The frequency and order of the mentions are the criteria in order to identify the potentially relevant characteristics. Traditional forms of the elicitation technique can be seen as insufficient because the specifications of attributes are not collected (Helm and Steiner 2008). Steiner (2007) presents with his advancement a survey design with which these specifications are collected in the survey. This approach was also used in this study in such a way that the respondents were explicitly asked to name the specifications to each mentioned characteristic.

The additional naming of specifications is crucial because the meaning of certain characteristic is determined by the decision maker's perceived, and thereby relevant, spectrum. The traditional forms of the elicitation technique, in which only the characteristics are requested, are thus not suitable to generate preference of the relevant characteristics. It is nearly impossible to assess the significance of a characteristic without having the knowledge of its specifications.

Schubert (1991) remarks that in the elicitation technique survey, the respondents are likely to name merely the characteristics which they have – possibly by chance – in mind. In contrast to this critique, Helm and Steiner (2008) see this aspect as an advantage of the method. These characteristics are salient, which is they are easy to access from memory and are therefore an indicator for the relevance of characteristics.

According to Jaccard et al. (1986) the order of listed characteristics is of great importance. This is to be considered for the allocation of scores. Via (1) the respective scores can be computed depending on the number of mentions of the respondent and depending on the order, where $i \in I$ and $n \in N$.

$$I_{ni} = \frac{N_i - r_{ni} + 1}{N_i} \quad (1)$$

Where:

I_{ni} = significance of the nth characteristic for the ith respondent

r_{ni} = position of the nth characteristic at the ith respondent

N_i = total number of characteristics named by the ith respondent

The computation according to Jaccard et al. (1986) implies that a nomination of many characteristics is an evidence for a well-informed respondent who possibly took a sufficient amount of time for answering the task. Accordingly, the importance weight is valued higher than of that of the respondents who mentioned a comparatively small amount of characteristics. The importance weight of the first mentioned item is independently always 1; hence the respondent's most important characteristic is always weighted equally.

(1) provided a basis for the computation of the importance scores in this study. It should be mentioned that certain steps which are intended in the EVAS method were not realised in this case. This is especially true for utilisation of the characteristics' specifications which were only collected in this study to avoid biases of the named items. For example, one employer might only name the characteristic "apprenticeship". In this case, the actual meaning is vague. One might interpret that the respondent refers to the grade or merely to the existence of a finished apprenticeship. Such ambiguities can be resolved when the characteristics' specifications are systematically requested. This approach proved beneficial in this study.

Furthermore, the EVAS method by Steiner (2007) only considers the frequency of the nomination of a characteristic and its specification. In this study, the score allocation by Jaccard et al. (1986) was used because the author agrees with the fact that the order of the mentioned items is a reflection of these characteristics' significance. Hence (1) was applied.

Implementation of the EVAS method was conducted through a questionnaire submitted via fax. The agricultural employers were asked to name all characteristics which seem relevant to them concerning agricultural workers. Furthermore, two farm specific questions were asked which were used to test certain relationships.

The sample consisted of all farms in the Mecklenburg-Western Pomerania which train agricultural apprentices.

The data were provided by the Ministry of Agriculture, the Environment and Consumer Protection. Overall the ministry possessed the data of 483 apprenticing farms. The dataset was revised and double entries were removed, whereby 472 farms remained. 262 companies possessed a receiving facsimile number (55.5%) and 218 questionnaires were successfully transmitted. 44 answered questionnaires were returned, thus resulting in the rate of return of 20.2%.

The resulting characteristics from the feedback were checked for redundancy and were summarized with regard to contents. In the course of this process, the request for specification of each characteristic proved very useful. A survey only directed for characteristics would have resulted in a flawed assignment.

Overall, the 44 respondents named 278 characteristics. Therefore, each proband named 6.3 characteristics in average – ranged from two to ten nominations per questionnaire. All resulting characteristics were disposed to 36 categories. With the aid of (1), an importance value I was computed for each category of characteristics. The characteristics which were not mentioned received a score of 0.

RESULTS AND DISCUSSION

Importance scores

The computed means of I_{ni} for every characteristic category are illustrated in Table 1. All computations were performed in the MS Excel.

It can be observed that specialised knowledge is seen as the most important characteristic of an employee, followed by the general interest in the vocation. Next items are reliability, independence and flexibility. "Willingness to perform" obtained, with the importance score of 0.1756, only half of the attribute "specialised knowledge".

In the next step, the composed categories were divided into two basic types of competencies. According to the mentioned approach, there was a division into generic and vocational characteristics. A conspicuous dominance of generic characteristics was shown there. Only four characteristics can be assigned to vocational characteristics: specialised knowledge, qualification (vocation), appreciation of farm animals and appreciation of farm business. All remaining categories were characterised as generic competences.

In fact, the "specialised knowledge", which was identified as most import characteristic, is a vocational competence. However, all remaining top spots in the ranking are dominated by generic characteristics. The dominance of generic characteristics is emphasised by the fact that their aggregated importance score means have the share of 83.1% in the sum of all means, while the share of vocational characteristics is only 16.9%. Among the first twelve characteristics – representing the first third – the vocational attributes have the share of 21.0% while generic competences

Table 1. Averaged importance values of the characteristic categories

Category	Importance value I
Specialised knowledge	0.3631
Interest	0.3157
Reliability	0.2832
Independence	0.2231
Flexibility	0.1966
Willingness to perform	0.1756
Qualification (school)	0.1682
Qualification (vocation)	0.1528
Resilience	0.1513
Willingness to acquire new skills	0.1504
Ability to work in a team	0.1475
Honesty	0.1312
Sense of order	0.0917
Manners	0.0829
Fitness	0.0698
Punctuality	0.0666
Motivation	0.0636
Leadership	0.0616
Ability to identify with farm work	0.0545
Diligence	0.0530
Consistency	0.0377
Sense of responsibility	0.0359
Foresight	0.0325
Ability to communicate	0.0284
Balance	0.0227
Appreciation of farm animals	0.0216
Appreciation of farm business	0.0202
Assertiveness	0.0187
Willingness to compromise	0.0177
Duteousness	0.0152
Circumspection	0.0152
Passion	0.0114
Constancy	0.0101
Goal-orientation	0.0091
"Down-to-earthness"	0.0045
Political attitude	0.0038

Source: compiled by the author

have the share of 79.0%. The identified farm specific importance scores for generic and vocational are denoted I_g and I_v, respectively.

Bivariate analysis

The obtained data were tested with respect to the possibly existent relationships. Two farm specific data were available: the administrative district ("Landkreis") and the farm size in hectares. Conceptions about the relationship between these variables were developed a priori.

The respective obtained importance score means for generic and vocational characteristics served as the dependent variable. However, the respective values of I_g and I_v were not used for this purpose. Instead, the respective quotient Q of the importance score of the competence type and of the importance score of all characteristics were composed:

$$Q_g = \frac{I_g}{I_{\text{aggregate}}} \tag{2}$$

$$Q_v = \frac{I_v}{I_{\text{aggregate}}} \tag{3}$$

This was necessary in order to take into account the consideration that the possible relationships are merely the result of a general lower importance score for both types of competences in case of larger farms. In the following sections, "importance" or "importance score" generally refer to the respective quotient Q.

Both farm specific variables served as the respective independent variable. There is no documented relationship in the literature between these variables. Only Larson (2008) came to the conclusion that the requirements concerning horticulture graduates differ considerably in the Midwest of the USA. An application of these results to this study does not seem appropriate. A correlative relationship between the farm size and the importance of the vocational characteristic was suspected by the author. This qualified estimate was a result of the subjective observations and experience that one can observe a distinctive division of labour and specialisation in more large-scale farms. Henceforth, this aspect shall be subject to a scientific-empirical examination. Two working hypotheses were composed, which were tested afterwards.

Working hypothesis 1

There is no significant relationship between the location of a farm in a certain district of the Mecklenburg-Western Pomerania and the importance of one of the competence types.

Working hypothesis 2

There is a positive relationship between the acreage of a farm in the Mecklenburg-Western Pomerania and the importance of one of the competence types.

In order to test these working hypotheses, statistical means were used that allow the quantification of the relationship between the variables. In case of the first working hypothesis, one must consider the different scales of measurement of both variables. While the importance score of the respective type of competence is scaled metrically, the information regarding district is on a nominal scale. Here, the analysis of variance is used to test whether the means of the importance scores between districts differ from each other.

As a result, it can be concluded that there is no relationship between the location of a farm in the Mecklenburg-Western Pomerania and the importance of a certain type of competence. The analysis of the importance score of vocational characteristics resulted in a F-value of 1.9349. Concerning generic characteristics, the F-value of 0.4665 was computed. Both analyses led to non-significant results (P = 0.0718 for Q_g and 0.9102 for Q_v). Both the F-values as well as the P-values underline that the means between districts differ more with respect to Q_g than with respect to Q_v. The null hypothesis cannot be rejected. As a result, the working hypothesis 1 can be confirmed.

In order to test the working hypothesis 2, the correlation coefficient can be computed. The distinction between the independent and dependent variables is obsolete in this. The Pearson correlation coefficient was used to quantify the possible correlations. Some assumptions must be made: (a) metric scale of measurement, (b) random sample, (c) linearity and (d) bivariate normal distribution.

In this case, the assumptions can be seen as appropriate. Both considered variables are on the metric scale of measurement and the polled farms form a random sample out of the population of all farms which train agricultural apprentices. It is assumed that the existence of a receiving facsimile number is a random occurrence. Furthermore, a linear relationship is assumed. According to Lehmann et al. (2005), the assumptions of normal distribution can be seen as fulfilled in most cases at the samples greater than 25.

The Pearson correlation coefficient can bee computed as shown in (4).

$$r_{xy} = \frac{s_{xy}^2}{\sqrt{s_x^2 s_y^2}} \tag{4}$$

Table 2. Correlation between Q and the farm acreage in ha

Variable	Correlation with respect to acreage	P
Q_g	–0.3224	0.0328*
Q_v	0.3772	0.0333*

Source: compiled by the author

In contrast to farm location, the relationships regarding the acreage of a farm can be observed. The computations of the respective correlation coefficient between the means of Q_g and Q_v and the variable farm acreage led to the following results (Table 2).

A statistically significant relationship between the farm acreage and the respective average importance of generic and vocational characteristics can be observed. The Pearson correlation coefficient accounts for –0.3224 and 0.3772, respectively. The null hypothesis can be seen as falsified. That is the importance of generic characteristics declines by trend with the increasing farm acreage. Accordingly, the importance of vocational characteristics is increasing relating to increasing acreage.

The Figure 2 shows, as an example, the scatter plot for Q_v on the basis of the obtained data. Furthermore, the density ellipse is illustrated, which visualises the correlation. The ellipse was computed using the statistical software package JMP from the SAS.

The borders of the ellipse are identical with the confidence borders. It is expected that 95% of all data is located in this area. The density ellipse can be used as the graphical indicator for the correlation of two variables. The more the ellipse is sloped diagonally, the more distinctive is the correlation.

The initial research question, how important certain characteristics of agricultural employees are from the perspective of agricultural employers in the Mecklenburg-Western Pomerania, could be answered to a large extent. Results of the open question led to many important attributes where the order of attributes as well as the respective importance scores should be considered.

The existence of specialised knowledge was identified as the most important characteristic. Mainly knowledge with respect to the production and work processes fell into that category. The prominent role of this characteristic is not surprising and it is consistent with other studies (Kretschmann 1982; Hansen et al. 1989). In contrast, other studies allocate the specialised knowledge more to the middle of the importance scale (Wagner 1985; Floyd and Gordon 1998).

General interest in the vocation is a further significant characteristic (Kreyßig et al. 2007). This high relevance is noteworthy because it is assumed to be a prerequisite for the respective employee when he or she pursuits employment in agriculture. At most, this aspect plays an inferior role for workers whose perspectives on the job market are highly limited.

Reliability, independence and flexibility are the classic competences which are demanded by the employers – not only in agriculture. Due to the seasonality of production, work peaks and diverse assignments on the farm, flexibility is especially essential in agriculture.

Bishop (1995, 1998) showed the results which are very similar to the results documented here. However, these studies were not devoted to the agricultural sector. There, a vocational characteristic was identified as the most important by the polled employers,

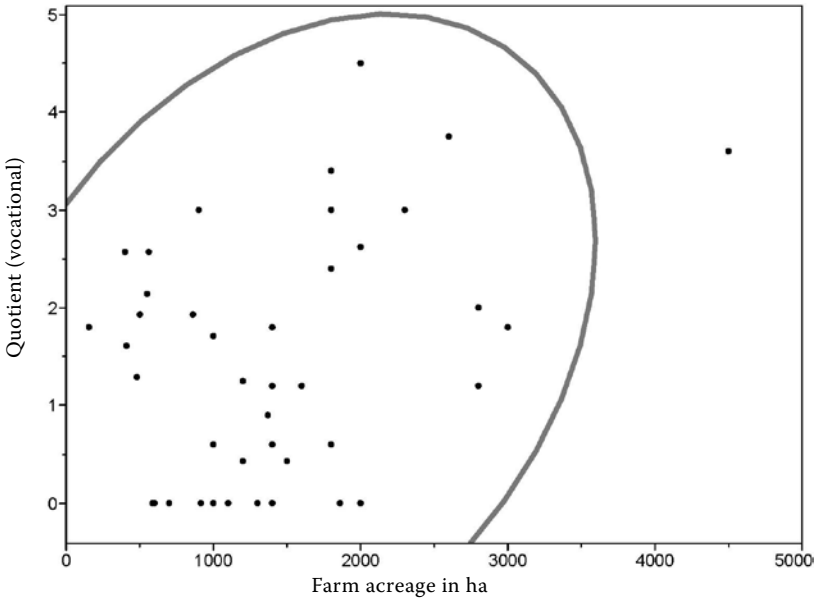

Figure 2. Bivariate normal ellipse $P = 0.95$ of Q_v against the farm acreage

Source: compiled by the author

followed by a multiplicity of generic attributes. This occurrence could be observed also in this study, since the attribute "specialised knowledge" contains a large amount of all importance scores of vocational characteristics.

Furthermore, the dominance of characteristics which can be allocated to generic competences is remarkable. Apart from the characteristic "specialised knowledge", all top-scored attributes are of generic nature. These findings are contradictory to wide parts of labour research. According to Smits (2007), employers have no interest that their employers posses non-vocational – that is generic – characteristics. A background of this is the theory that additional generic attributes grant an employee better chances on the job market and thus raising wages in the respective sector. This theory contravenes the statements of the polled agricultural employers who prefer the classical generic characteristics like reliability, independence and flexibility with respect to the labour force.

Mulcahy and James (2000) found in an employer survey that vocational competences are preferred for employees who work in primary production, whereas generic characteristics become more important for the higher ranked vocations. The question must be considered whether the agricultural sector is an anomaly in this context. Smits (2007) remarks that employers underestimate the mobility of the respective economic sector with their overemphasis of vocational characteristics. This very mobility demands a high degree of generic skills. This is especially true for the sectors with a fast technical progress.

According to Lazear (2003), different generic attributes of an employee have a higher value outside the current economic sector. Henceforth, an employed farmer who possesses a bundle of characteristics which consist mainly of the attributes the respondents considered important might find a more attractive job outside agriculture. This instance is yet another reason why the employers emphasize rather vocational competences by trend. This aspect is irrelevant for agricultural managers in this study. It is possible that agriculture is contrary to other sectors in this case, too. One can find a possible explanation in the fact that the mobility of agricultural labour force is relatively low (Andermann and Schmitt 1996; Rückert-John 2005) and hence such considerations on the part of employers play an inferior role.

CONCLUSION

It can be assumed that generic attributes of employees are valued higher compared to other economic sectors due to the high pressure to change within the agricultural sector and due to the relatively marginal mobility of the potential employees. It is not clear to what extent the expressed causation-and-effect relationship show stability with respect to space and time. This aspect is going to be investigated in the further parts of the research project.

As another result of the study, a correlative relationship between farm acreage and preference for generic and vocational competences respectively was observed. The accordant hypothesis was confirmed. It could be observed that the importance of generic characteristics is decreasing by trend with the increasing acreage, while the importance of vocational attributes is increasing. Such a finding is hitherto to the best of the author's knowledge not documented in the literature. In fact, already Harbeck and Riemann (1975) identified a positive relationship between the farm acreage and the qualification requirements regarding labour force, but there was no distinction between generic and specific competences. In this case, one can only make qualified estimates about the underlying factors, too. The occurrence that a more distinctive division of labour and specialisation in more large-scale farms can be observed might serve as an answer (Immler 1973; Quendler 2005). Due to this fact, competences might come to the fores that are more geared towards the concrete assignments. In case of smaller farms, it is often necessary that the employees attend to different tasks because the intra-farm division of labour is not that pronounced and the tendency towards individual specialisation of an employee is less distinct. Concerning this background, the significance of generic characteristics is rising because these attributes are transferable (Smits 2007) and can be applied in various work processes. Especially characteristics like flexibility come to the fore under these conditions. Classic generic competence like ability to solve problems gain relevance under the conditions with often changing work assignments. An employee's utility is higher for smaller farms if the share of generic characteristics in the workers "utility bundle" is relatively high.

The obtained findings of this study shall be a starting point of further research which is linked with the offered conclusions and which will further investigate their validity.

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Arrived on 9th April 2010

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