

Approach to the differentiated motivation of employees in agriculture

MILOŠ HITKA¹, LENKA LIŽBETINOVÁ^{2*}, JOZEF ĎURIAN³, AGOTA GIEDRĖ RAIŠIENĖ⁴

¹Faculty of Wood Sciences and Technology, Technical University in Zvolen, Zvolen, Slovakia

²Faculty of Technology, The Institute of Technology and Business in České Budějovice, České Budějovice, Czech Republic

³Faculty of Economics, Matej Bel University in Banská Bystrica, Banská Bystrica, Slovakia

⁴Faculty of Public Governance and Business, Mykolas Romeris University, Vilnius, Lithuania

*Corresponding author: lizbetinova@mail.vstecb.cz

Citation: Hitka M., Ližbetinová L., Ďurian J. Raišienė A.G. (2025): Approach to the differentiated motivation of employees in agriculture. *Agric. Econ. – Czech*, 71: 46–57.

Abstract: The capacity for flexibility, personal development, and intrinsic motivation is a crucial aspect needed by employees in the process of transforming agricultural organisations. This paper aims to determine the typically oriented groups of employees in terms of their motivation and verify whether the identified groups are invariant even under changing conditions over time. The data from 2019–2023 (from 374 respondents employed in agricultural enterprises in south-central Slovakia) were evaluated using descriptive and inferential (K-means cluster) statistics. According to preferences and constancy of attitudes, three clusters of employees called ‘Materialists’, ‘Team progressives’, and ‘Preferences settled’ were determined. The clusters were also solved in terms of stability over time. Despite the differences in the preferences of these clusters, relational factors indeed played one of the most critical roles, even in the case of materialistically oriented employees. The practical result of the research is the possibility of designing a differentiated motivation program specifically targeted to individual groups of employees with similar motivational preferences based on a competent statistical analysis of motivation. The results are used by agricultural businesses to design motivation programs for similarly motivationally oriented employees sophisticatedly.

Keywords: age; clusters; human resource management; K-means; staff; work preferences

Agricultural cooperatives as a form of business have had a longstanding tradition in Slovakia since 1845. In Slovakia, more than 44% of agricultural land is currently managed by agricultural cooperatives. Commer-

cial companies manage only 38.2%, and independent farmers only 16% of agricultural land. In Slovakia, agricultural cooperatives also play an essential social role in the countryside, as they are often the only or one

Supported by projects KEGA 012UCM 4/2022 Human Resources Management in a Digital World - A Bilingual (Slovak-English) Course Book with E-learning Modules based on Multimedia Content, APVV-20-0004 The effect of an increase in the anthropometric measurements of the Slovak population on the functional properties of furniture and the business processes, APVV-22-0001 Optimization of main health and safety risks in the use of forest biomass for energy purposes, KEGA 004TU Z-4/2023 Innovative methods for assessing the quality potential of forest stands and the project 02SVV2325 Methodology proposal in the context of investigating the influence of the height profile of roads on the reduction of emissions from road transport, VEGA 1/0012/25 Interaction of motivation and corporate culture in companies in the Slovak Republic.

© The authors. This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0).

<https://doi.org/10.17221/118/2024-AGRICECON>

of the few sources of employment in many rural areas and thus contribute to reducing emigration from these areas (Statistical Office of the SR 2022). Employment in the agricultural sector has been declining for a long time. At the same time in 2023, it represented a share of 3.5% of total employment and gradually became one of the least numerous sectors in the Slovak Republic. A similar decline is also taking place within the European Union. This phenomenon is related not only to the gradual automation of production activities (in I.Q 2024, it had a share of 0.5% of vacancies) but also to the ageing of workers and reaching retirement age, but also to a lower interest in working in agriculture among younger generations (Trexima 2020; Eurostat 2024; Statistical Office of the SR 2024). It is a field with a lower salary rate, strong seasonality, sensitivity to climate changes, and often more physically demanding work in a rural environment. Also, this work can bring health risks associated with physical factors of the working environment, such as noise, dust, or work with chemical sprays and the like. Agriculture is also going through turbulent changes that require a change in the competence structure of existing workers in connection with the innovations of Agriculture 4.0 and also increasingly demanding restrictions aimed at environmental protection (Trexima 2020).

Researchers pay much attention to the topic of employee motivation, especially from the point of view of the relationship to work performance, which is confirmed by most studies (Das et al. 2019; Jeki and Sulastri 2019; Goel and Rashmi 2023; Jarkovská and Jarkovská 2024). Moreover, insufficient attention is given to the specifics of motivation due to the nature of the job content and market conditions in branches, including agriculture (Das et al. 2019; Goel and Rashmi 2023). Furthermore, published research does not sufficiently address the broader context of the development of motivational preferences over time and the studies are limited to the results of investigating motivational preferences and satisfaction without showing a possible solution approach (Goel and Rashmi 2023; Pincus 2023). In connection with the industrial revolution, studies focused on the potential of employees for changes and innovations associated with the 4.0 Economy (Karimi et al. 2022; Çini et al. 2023; Hitka and Ližbetinová 2023) are also being addressed.

Several studies point to the need to know the motivational preferences of their employees, which can subsequently be used in the process of their compelling motivation (Kumlander 2015; Jankelová et al. 2020; Karacsony and Vinichenko 2021; Yekimov et al. 2021).

This research contributes to the knowledge gap by analysing the specific environment of agricultural production and solving the question of how to identify the particular preferences of groups from the point of view of time. The aim of the work is to determine typically oriented groups of employees in terms of their motivation and to verify whether these groups are stable over time. The use of cluster analysis in the issue of identifying motivational groups of workers for practical use is also innovative. Its use is to help the company management create motivation programs for employees in an effort to increase employee performance (Yekimov et al. 2021). Creating a uniform motivation program is not a suitable solution if we want to motivate employees according to their personal needs effectively. By grouping employees into similarly motivated groups, the company can increase their performance, thereby achieving higher corporate prosperity.

The theoretical part of the contribution looks at the current knowledge of the investigated issue, supported by the methodology in terms of the set goal and the methods used. The presented results are also discussed with the conclusions of other studies, and the research limits are determined.

Theoretical background. One of the conditions for increasing the effectiveness of the employee performance of any business is to motivate employees (Jankelová et al. 2022). Motivation, as one of the basic prerequisites in the success and effectiveness of people's performance in the work process, forms an essential part of the theory of human resource management (Smerek and Vetráková 2020). The authors in the field of human potential management consider the ability to motivate the most crucial and, at the same time, the most demanding skill of the managerial employee. The company's profit is directly linked to the effective implementation of the motivation program (Pohanková 2009). Nevertheless, it can be found in modern corporate practices that, although very effective when used appropriately, motivation is frequently undervalued as a component of employee management (Kohnová et al. 2023). The motivation process itself is based on several theories that attempt to explain in more detail what motivation and the act of motivation are. Motivating employees can be done through group or individual motivation programs. Their type and form directly depend on the managers' abilities and the company's strategies (Cabanilla Guerra et al. 2022). The creation of a motivation program should be preceded by the knowledge and evaluation of all the factors affecting the performance of employees and

<https://doi.org/10.17221/118/2024-AGRICECON>

the functioning of the business (Gottwald et al. 2017; Martínez-Cañas et al. 2023). These factors include information about the technical, technological, and organisational conditions of work, the nature of the work environment, working conditions, social amenities of the workplace and the characteristics of job satisfaction or dissatisfaction, value orientation, relationship to work, to co-workers, to supervisors, to the business as a whole (Tokarcikova et al. 2020). This information is not sufficiently telling, so it is also essential to obtain information on the social, demographic, and professional qualification characteristics of employees, on the applied system of evaluation and remuneration of employees, on the system of social work in the business and the system of personnel management (Urbancová and Vrabcová 2022). The level of employee motivation is also dependent on external factors of the macroeconomic environment in which the business is located. One such factor in recent years was the COVID-19 pandemic, which has directly affected production and efficiency in businesses in a significant way. Overall employment and work in human resource management, whether in the form of home office or downsizing, has been affected (Blanco-Mazagatos et al. 2018). Social isolation brought about a turning point in the increased importance of relational factors in the workplace and in agriculture (Yekimov et al. 2020; Carpio and Urbano 2021). The specifics of the agriculture industry require motivation and the related relationship to job content (Verdugo-Castro et al. 2022). A study from Kosovo (Behluli et al. 2020) confirmed the positive interaction of job characteristics (skills variety, task identity, task significance, autonomy and feedback) on the internal motivation of employees in agriculture, with autonomy and feedback showing a high positive correlation. Similar results were found in a slightly older study from a dairy farm environment in Sweden, where open-ended questions showed above all the importance of relational (such as fun at work, good management, good team spirit) and work factors (feedback from managers, life in the countryside, meaningful and interesting work, safe and healthy workplace, flexible work tasks). However, a sense of pride in one's work and job security also exist. A comparative analysis of the motivation of employees of Bulgarian and Hungarian agricultural enterprises (Karacsony and Vinichenko 2021) also shows that salaries and working conditions strongly influence agricultural workers in both countries. This comparative analysis enabled a more systematic view of the difficulties of motivation in agriculture, but it does not include the development over time. A study

examining the motivational preferences of employees of agricultural enterprises in Slovakia (Jankelová et al. 2020) provided significant insights, which not only points to a substantial relationship between the effectiveness of motivation in terms of finance and employee satisfaction, which, according to them, directly affects the performance of the enterprise. They also pointed out that age, education, and job position are essential factors influencing personal preferences and the perception of satisfaction within the motivation framework, which subsequently recommends applying new trends in employee remuneration with regard to employee categories. The question of identifying common groups of employees with a similar motivational orientation in agriculture is also outlined by Kumlander (2015). His contribution provides only a rough outline, which cannot be analysed in more detail regarding the methodology used. Interesting conclusions come from studies focusing on the motivation and characteristics of employees related to the potential for the necessary competencies in Agriculture 4.0 (Karimi et al. 2022; Çini et al. 2023; Hitka and Ližbetinová 2023). According to Hitka and Ližbetinová (2023), the majority of employees of agricultural businesses in the Slovak Republic are motivated by the opportunity for further education and growth, independent decision-making, receiving feedback on work results and skills application. Given the high potential for automation according to the number of jobs in agriculture, forestry, and fishing determined by the McKinsey Global Institute, the need for a progressive, i.e. educated and further educated, group of employees will be high (Pogorelskaia and Várallyai 2020).

The creation of a motivation program should be preceded by knowledge and evaluation of the factors affecting employee performance and business functioning. These facts include information about technical, technological and organisational conditions of work, the nature of the work environment, working conditions, social amenities of workplaces and characteristics of job satisfaction or dissatisfaction, value orientation, relationship to work, to co-workers, to supervisors, and to the business as a whole (Maj 2023).

It is advisable to create a motivation program tailored to each employee. However, the above method of motivation could be more economical and time-consuming (Yildirim and Han 2023). On the other hand, creating blanket motivation programs may miss the effect due to the specific differences in the motivational needs of individual employees. In many cases, these are minor differences in employee motivation preferences,

<https://doi.org/10.17221/118/2024-AGRICECON>

but they can have a significant impact on the overall effect of a motivation program. One option is to design motivation programs for similarly motivation-oriented groups of employees. This method eliminates the across-the-board impact of a motivation program for all employees by dividing them into groups using multivariate statistical methods.

MATERIAL AND METHODS

A questionnaire consisting of 30 closed-ended questions was used to collect data (Hitka et al. 2022). The questionnaire was divided into two parts. Its first part investigated the socio-demographic and qualification characteristics of the employees. Through this part, primary data about the respondents regarding their age, gender, number of years of service in the company, education completed, and job position were obtained. The second part of the questionnaire consisted of thirty individual motivation factors (Table 1), whose perceived importance was indicated by the respondents on a scale from 1 to 5 (1 – unimportant, 5 – very important). The questionnaire was distributed in 2019, 2020, 2022, and 2023 to agricultural enterprises in south-central Slovakia that were engaged in crop cultivation, livestock breeding, and hunting. All employees were contacted, with an average number of 163 employees during the years 2019–2023. The results are based on the processing of 374 correctly completed questionnaires during the research period. A more specific structure of respondents in each year is presented in Table 2.

To avoid influencing the respondents, the motivation factors were arranged alphabetically. Employees could

assign each motivation factors one of five levels of importance on a 5-point scale, with 1 being unimportant and 5 being the most important. Reliability was tested using McDonald's omega, which had a resulting value of 0.908 for the thirty items. The questionnaires were scored using SPSS 28.0.0. Descriptive statistics were used to characterise the underlying sets. Subsequently, three separate groups of employees were selected using K-means cluster analysis according to their perceived importance attitudes within the five groups of motivation factors (related to relationship, finance, work, social aspects and career). The ranking of the thirty motivation factors into the five groups is presented in Table 1.

The resulting three clusters were selected after comparing the results for clustering into 2, 3, and 4 clusters. These results varied by sorting the data through a random number generator because the K-means cluster method is sensitive to the order of values entering the analysis. Cluster analysis (CLUA) is the possibility of using the information in a multidimensional observation to sort objects into homogeneous clusters. Subsequently, a suitable interpretation for the described decomposition has to be found. The goal is to achieve a state where objects within clusters are as similar as possible, and objects from different clusters are as dissimilar as possible (Gottwald et al. 2018). The above data collection and evaluation procedure was directed towards the verification of the following research hypotheses:

H_1 : In the analysed agricultural company, there are preferentially different groups of employees in terms of the perceived importance of the investigated motivation factors.

Table 1. Motivational factor groups and their reliability

Group	Motivation factors	McDonald's omega
Finance	basic salary, other financial evaluation, fairness of evaluation, benefits	0.829
Relationship	atmosphere at the workplace, communication, good working team, attitude of the supervisor	0.774
Work	physical demands of the job, job security, job description and type of work performed, familiarity with work performance, working time, working environment, work performance, safety, mental stress, leisure time	0.776
Career	company name, opportunity to apply skills, job advancement, job competencies, prestige, independent decision-making, self-actualization, education and personal growth, recognition	0.841
Social aspects	vision of the company, development of the region, ecological approach of the company	0.701

Source: Authors' own elaboration

Table 2. Number and structure of respondents in each year

Age (years)		Year				Total
		2019	2020	2022	2023	
≤ 30	count	8	20	30	24	82
	% within age	9.8	24.4	36.6	29.3	100.0
	% within year	7.8	24.4	34.9	23.1	21.9
31–40	count	49	10	15	43	117
	% within age	41.9	8.5	12.8	36.8	100.0
	% within year	48.0	12.2	17.4	41.3	31.3
41–50	count	39	33	15	33	120
	% within age	32.5	27.5	12.5	27.5	100.0
	% within year	38.2	40.2	17.4	31.7	32.1
≥ 51	count	6	19	26	4	55
	% within age	10.9	34.5	47.3	7.3	100.0
	% within year	5.9	23.2	30.2	3.8	14.7
Total	count	102	82	86	104	374
	% within age	27.3	21.9	23.0	27.8	100.0
	% within year	100.0	100.0	100.0	100.0	100.0

Source: Authors' own elaboration

The hypothesis was aimed at the need to balance personal characteristics in the process of motivating employees in agriculture, and at the same time, it was based on the assumption that groups of employees shared motivational preferences (Kumlander 2015; Yekimov et al. 2021; Karimi et al. 2022; Hitka and Ližbetinová 2023).

H_2 : The determined groups of employees in terms of their motivational preferences are present within the individual years analysed 2019–2023.

Since motivation changes over time are also influenced by external factors, such as the economic level of the region, and changes in environmental conditions due to crises (economic or pandemic) (Yekimov et al. 2020; Hitka and Ližbetinová 2023), it is not sure that the identified motivationally oriented groups will exist for more extended periods. For the sustainability of incentive programs, the stability of similarly oriented incentive groups is positive.

RESULTS AND DISCUSSION

The research focused on the question of the importance given to the 30 observed motivational factors (which were sorted into 5 groups – relational, financial, social, work and career, see Table 1) from the point of view of the employees of the agriculture company and how these preferences change over the period under re-

view. The results of perceived importance by motivational factor group over time are presented in Figure 1.

In the long term, it can be concluded that factors related to relationships and finance play the most significant role in terms of the employees' needs of the agricultural companies under study (Figure 1), with factors related to relationships receiving an average rating of 4.37 over the period under study. Slightly lower average ratings were given to factors related to finance (4.20), followed by career (4.07), work (4.01) and social (3.73) factors. The change in the importance rating from year to year could have been influenced by several factors, both macroeconomic (uncertainty and change in macroeconomic indicators due to the COVID-19 crisis, war conflicts, or political instability) and internal (staff turnover, strategy, and management setup of the company).

As already noted in the literature research (Nasir et al. 2019; Colclasure 2020; Pogorelskaia and Várallyai 2020; Verdugo-Castro et al. 2022), these changes in motivation are natural and present across economic sectors. That is why it is more challenging to build motivation programs in a way that makes them usable in the longer term, possibly with only minor adjustments on an ongoing basis. In 2023, several new hires between the ages of 30 and 50 have been made due to the retirement of older employees. It may explain the significant change (at the 5% significance level) in the perceived importance of a group of career factors (av-

<https://doi.org/10.17221/118/2024-AGRICECON>

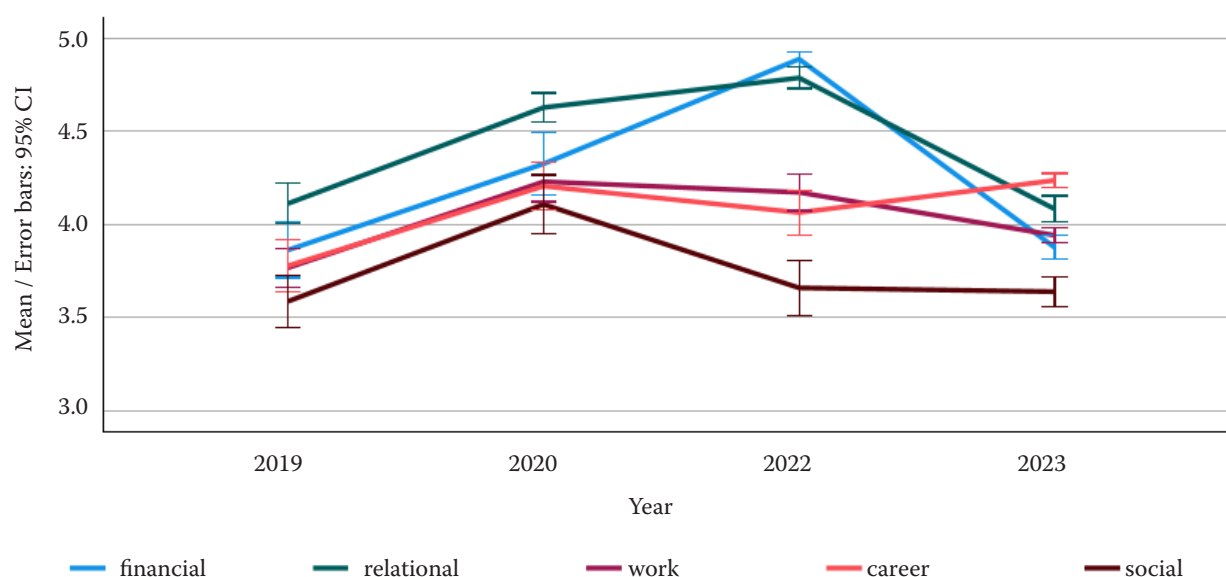


Figure 1. Preferences of groups of motivation factors in the 2019–2023 reference period

Source: Authors' own elaboration

erage of respondents' ratings = 4.23) in 2023, which were perceived as even more critical than factors related to relationships and finance). There was also a surprising and significant (at the 5% significance level) decrease in the importance attached to factors related to finance, which may be due to an increase in salaries and, thus, the fulfilment of employees' financial needs.

Cluster analysis was supposed to help us answer the research question of whether there are certain motivational types in the company, i.e. groups of people with similar motivational preferences, how many such types there are, and what makes each type characteristic, or how they differ significantly from each other. Based on the clusters formed by K-means clustering, we can use the similarity of respondents' motivational views to assign motivators to motivation programs for similarly motivationally oriented groups of employees. However, the issue of the stability of such groups over time is a significant factor. Based on the results of the research in the analysed agricultural businesses, three primary groups of similarly motivationally oriented respondents can be distinguished (Table 3). According to their preferences and constancy of attitudes, we called them 'Materialists' (cluster 1), 'Team progressives' (cluster 2), and 'Preference settled' (cluster 3). The clusters were determined by attitudes towards the five groups of motivational factors, with an ANOVA test assessing their difference at the 1% significance level. The formation of these clusters was most dependent on factors related to finance ($F = 326.99$), followed

by social ($F = 166.29$) and relational ($F = 153.75$) factors. On the contrary, career factors ($F = 34.16$) contributed the least to the formation. This way, the first research hypothesis H_1 can be verified. At the same time, their presence in all the years under study also verifies the hypothesis H_2 . The results are presented in Figures 2–4.

Cluster 1 ('Materialists') made up 31% of respondents. Their representation within age groups was almost balanced (29% of the youngest and older middle-aged groups, 18% of the younger middle-aged group and 24% of the oldest age group). We got a different perspective on how many of the total age groups of respondents fell into this cluster. In that case, it can be mentioned that up to 51% of the oldest employees and 40% of the youngest employees identified with this cluster. For the middle age groups, it was only 18–28%. Thus, it can be concluded that the middle-aged employee cluster had an increased preference for the cluster related to finance (Figure 2), which ultimately had precedence in the long run. However, they also placed an essential preference on factors related to relationships. This group of employees had noticeable volatility regarding the importance of work and social factors (significant changes at the 1% significance level over time). This group of employees was present throughout the study period from 2019 to 2023. Given the results of previous studies, it is expected that the materialistic-oriented group is often present within the population, not only in agribusinesses (Dibiku 2023).

Table 3. Representation of employees in each cluster in terms of age

Age (years)		Cluster number of case			Total
		1	2	3	
≤ 30	count	33	23	26	82
	% within age	40.2	28.0	31.7	100.0
	% within cluster	28.7	12.8	32.5	21.9
31–40	count	21	83	13	117
	% within age	17.9	70.9	11.1	100.0
	% within cluster	18.3	46.3	16.3	31.2
41–50	count	33	67	20	120
	% within age	27.5	55.8	16.7	100.0
	% within cluster	28.7	37.4	25.0	32.0
≥ 51	count	28	6	21	55
	% within age	50.9	10.9	38.2	100.0
	% within cluster	24.3	3.4	26.3	14.7
Total	count	115	179	80	374
	% within age	30.7	47.9	21.3	100.0
	% within cluster	100.0	100.0	100.0	100.0

Source: Authors' own elaboration

Cluster 2 ('Team progressives') made up 48% of respondents. They comprised 83% of middle-aged employees between 31 and 50 (i.e., 46% under 40 and 37% under 50). In terms of the total number of employees, 71% of workers in cluster 2 were between the ages of 31 and 40. Similarly, more than half of employees aged 41 to 50 were in cluster 2 (56%). This cluster was minimally represented by the oldest age group at only 3.4%. This group of employees consistently held high expectations for career and relational factors. Conversely, this cluster ranks financial factors the lowest relative to other employees. There is a significant increase in the preference for factors related to relationships in 2020 (at the 1% significance level) and a substantial change in 2023 for both career and financial factors (also at the 1% significance level). The results of Hitka et al. (2022), as well as those of other authors (Close and Martins 2015), are confirmed by the existence of this group. The presence of a similarly situated group of employees is crucial for companies in every industry (Gottwald et al. 2018; Vinš and Durec 2021; Baksa and Branyiczki 2023; Oladimeji et al. 2023).

Cluster 3 ('Preferentially settled') made up 21%. It was the least represented group of employees. It was a group of employees whose age profile was not strongly defined, with representation ranging from 16% to 32% across age groups. In terms of percentage representation within the different age groups, the cluster

thus contained the fewest middle-aged employees (up to 40 years of age is 11% and from 41 to 50 years of age is 17%). On the contrary, the youngest and oldest age groups were on average one third oriented in this group (up to 30 years of age in 32% and over 50 years of age in 38%). The group was characterised by placing equal emphasis on factors related to relationships and finance and also perceives work and career factors to be at comparable levels over the long term. A more significant change came in 2023 when the perception of factors related to finance decreased singularly compared to the previous two years (at the 1% significance level). This cluster of employees had relatively stable attitudes of perceived importance over time, and it is noticeable that preferences for the factors related to relationships and finance were significantly higher than for the other clusters (closer to a value of 5). In terms of setting long-term motivation programs, this group was interesting precisely because of the temporal constancy of their preferences and the challenge of the great difficulty they attach to individual factors.

Based on the results presented above, H_1 was verified following the ANOVA (which includes the process within the K-means cluster) at a significance level of 1%, as presented in Table 3. The analysed agricultural company had preferentially different groups of employees in terms of the perceived importance of the investigated motivation factors. The possibility of dividing employ-

<https://doi.org/10.17221/118/2024-AGRICECON>

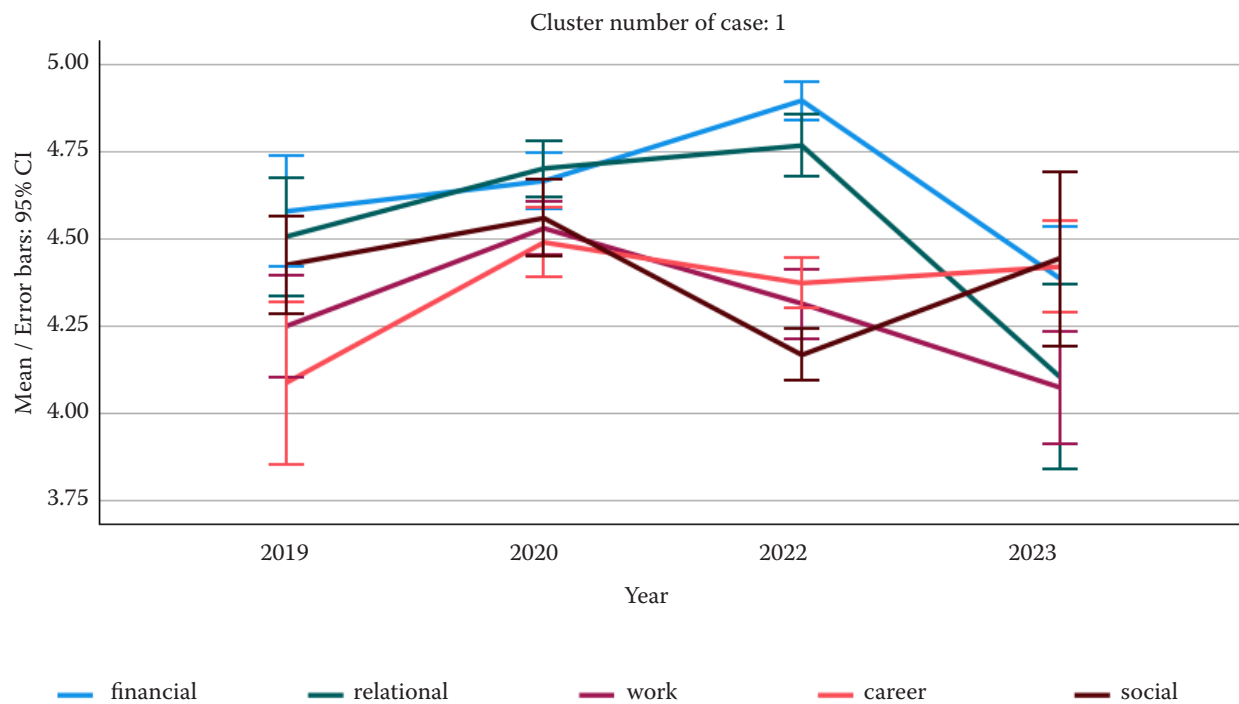


Figure 2. Preferences of motivation factors in the cluster of ‘Materialists’ over time

Source: Authors’ own elaboration

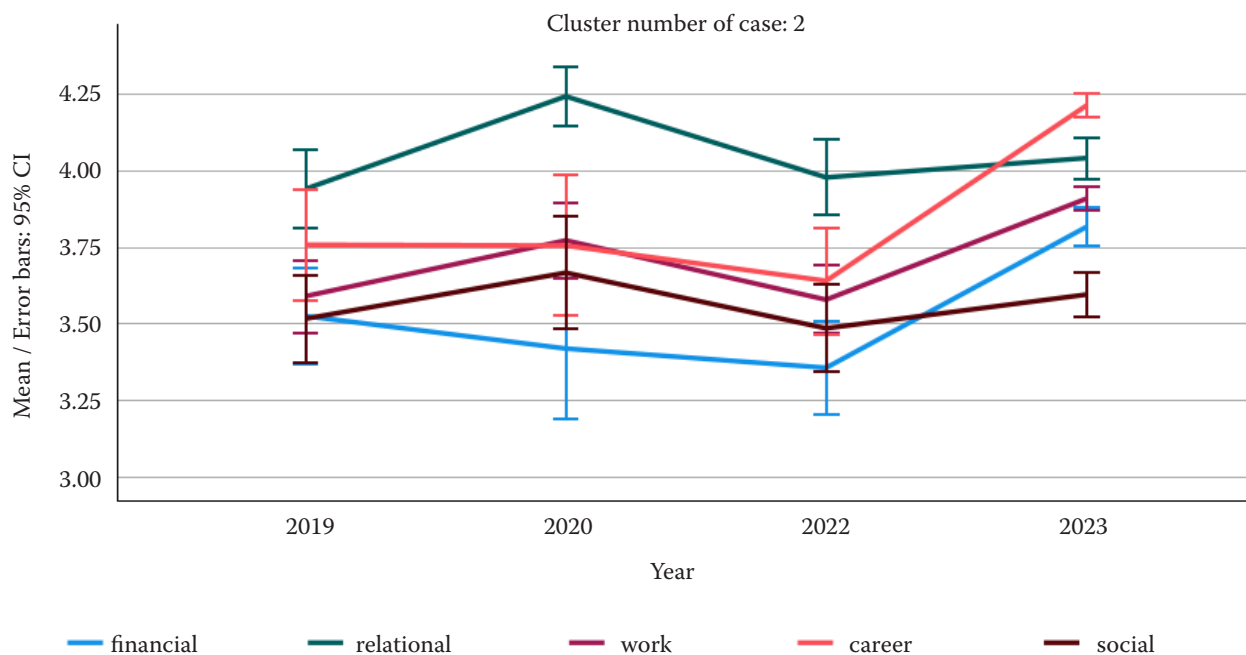


Figure 3. Preferences of motivation factors in a cluster of ‘Team progressives’ over time

Source: Authors’ own elaboration

ees into groups according to their preferences is not limited to the company. The results present an example of the motivational structure of an ordinary agricultural

enterprise in the environment of the Slovak Republic, as well as the possibilities of how it is possible to work on a small and medium-sized enterprise with differ-

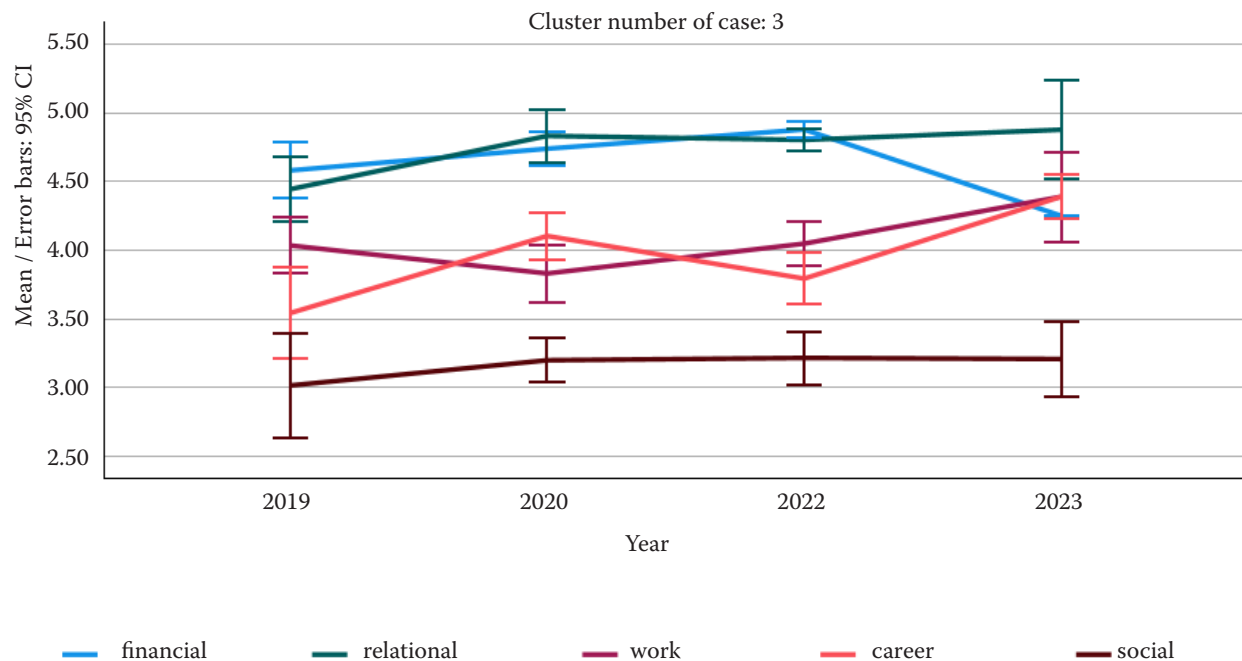


Figure 4. Preferences of motivation factors in the cluster of ‘Preferentially settled’ over time

Source: Authors’ own elaboration

ences in preferences. Studies analysing the motivational preferences and satisfaction of employees in agriculture emphasise the need for a more targeted approach according to personality characteristics (Kumlander 2015; Behluli et al. 2020; Jankelová et al. 2020; Yekimov et al. 2021; Globočnik Žunac 2024), while the sophisticated method of applying this recommendation is missing in published knowledge. At the same time, the very existence of the ‘Team progressives’ and ‘Preferentially settled’ clusters shows the dominant significance of relational factors, which was outlined by some published research (Behluli et al. 2020; Yekimov et al. 2020; Carpio and Urbano 2021; Karacsony and Vinichenko 2021; Hitka and Ližbetinová 2023).

On the other hand, the issue of the importance of setting a fair financial evaluation, which occupies an important place in incentive programs, was also confirmed. However, the problem is that the remuneration system is only sometimes efficient and flexible enough in the environment of agricultural enterprises (Mironova et al. 2021). The second research hypothesis was formulated from the point of view of the change of preferences over time within the already determined groups and potentially the sustainability of the set motivation program. H_2 was verified following the fact that

the cluster had representation in each of the monitored years 2019–2023. It is precisely the question of the representation of determined clusters in time that may not be fulfilled. Therefore, it is advisable to perform the motivation analysis repeatedly. The limits of our research are at the level of the research set, which focuses on a selected company operating in agriculture. It may not be typically represented in terms of the structure of the population working in agriculture. Also, the management setup of a particular company and its corporate culture partly influence the employees. Another limiting factor is the frequency of representation of age groups in individual years in the research set, which was affected by the incomplete return of questionnaires and, above all, the natural turnover of employees (maternity leave, retirement, longer-term health complications, etc.). However, the stated limitations do not affect the goal of the research and the verification of the hypotheses. They mainly affect the specific representation of employees in the designated clusters and their changing preferences over time. The existence and use of these clusters in further research and practice are not affected by the mentioned limits.

The use of cluster analysis methods can be seen in the processing of data from a survey of expectations re-

<https://doi.org/10.17221/118/2024-AGRICECON>

garding developments in the national economy or in the processing of data from research on interpersonal behaviour, value orientations, etc. (Kucharciková et al. 2019). This statistical procedure is also recommended by other authors as suitable for specifying customer segments based on certain common customer characteristics. Therefore, cluster analysis is considered a suitable tool for defining and specifying similar groups, as demonstrated in our research. At the same time, we can also observe the effect of the COVID-19 crisis on the level of employee motivation. A similar impact has been described by Siejka and Szajt (2022); Abdelwahed and Soomro (2023) and Mandal et al. (2023).

Identifying specific motivators for a given motivational type of employee (Vlacseková and Mura 2017) allows us to compile an optimal motivation program differentiated for relatively homogeneous (concerning preferred motivators) groups of employees. The sub-outputs of the motivation program should be detailed for each specific group of employees so that, in addition to the relevant motivators, they also include the selection of specific forms and specific conditions for their application (Vinš and Durec 2021).

CONCLUSION

Effective employee motivation hinges on a deep understanding of the unique motivational factors that drive different types of employees. This knowledge is crucial for designing tailored motivation programs that resonate with each group. An efficient and cost-effective employee motivation program should be one of the critical tasks of every company. Its improper design and application can hurt employees. As currently motivating employees does not cover all their needs, it is necessary to design sophisticated motivation programs for individual similarly motivated groups. The aim was to determine the typically oriented groups of employees in terms of their motivation and to verify whether the identified groups are invariant even under changing conditions over time. Using the K-means clusters method, three different groups were identified ('Materialists', 'Team progressives' and 'Preferentially settled'), the characteristic features of which were present during the entire monitored period 2019–2023.

The members of the group 'Preferentially settled' place equal main emphasis on factors related to relationships and finance and also perceive work and career factors to be at comparable levels over the long term. 'Team progressives' are workers who primarily need a well-functioning background of a relational nature,

while factors related to work and career are also significant for them. On the contrary, factors in terms of finance are perceived as less necessary from this point of view. For employers, these workers have a high potential, and the positive fact is that they were represented in the selected company by up to 48%. The last group is 'Materialists', who perceive the most important factors connected with financial evaluation. However, the issue of interpersonal relations in the workplace is recognized by them. The presented approach and the existence of specifically oriented groups of employees were to show the possibility of creating a valid mathematical-statistical procedure for creating a motivation program aimed at the typology of employees concerning their preferred motivation factors. The practical effect of our research is the possibility of constructing a differentiated motivation program specifically targeted to individual groups of employees with similar motivational preferences following a competent statistical analysis of motivation. The future direction of research in this area will be to explore other effects of human resource management in relation to employee motivation. A sophisticated approach to the motivation of employees in agriculture is necessary in the context of the development of employment and the innovations required in this sector. The article shows that the existence of creating incentive programs based on modern statistical methods is actual and deserves further attention.

REFERENCES

- Abdelwahed N.A.A., Soomro B.A. (2023): The COVID-19 crises: The threats, uncertainties and risks in entrepreneurial development. *Risks*, 11: 89.
- Baksa M., Branyiczki I. (2023): Invisible foundations of collaboration in the workplace: A multiplex network approach to advice seeking and knowledge sharing. *Central European Business Review*, 12: 87–104.
- Behluli A., Qerimi F., Borisov P., Hajdari M. (2020): The impact of the job characteristics on employees' internal motivation: A case study into Kosovo's agribusinesses. In: 20th International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management, SGEM, 20: 595–602.
- Blanco-Mazagatos V., De Quevedo-Puente E., Delgado-García J.B. (2018): Human resource practices and organizational human capital in the family firm: The effect of generational stage. *Journal of Business Research*, 84: 337–348.
- Cabanilla Guerra G., Cando Carrillo C., Valencia Chica M.I. (2022): Job satisfaction as a determinant of human capital

<https://doi.org/10.17221/118/2024-AGRICECON>

- productivity (Satisfacción laboral como determinante de la productividad del capital humano). *Revista Universidad y Sociedad*, 17: 42–52. (in Spanish)
- Carpio D.A., Urbano B. (2021): How to foster employee satisfaction by means of coaching, motivation, emotional salary and social media skills in the agri-food value chain. *New Medit*, 20: 40.
- Çini M.A., Erdirençelebi M., Akman A.Z. (2023): The effect of organization employees' perspective on digital transformation on their technostress levels and performance: A public institution example. *Central European Business Review*, 12: 33–57.
- Close D., Martins N. (2015): Generational motivation and preference for reward and recognition. *Journal of Governance and Regulation*, 4: 259–270.
- Colclasure B. (2020): Entry-level workplace competencies needed by graduates of a community college agriculture program: A Midwest case study using the Delphi technique. *Journal of Research in Technical Careers*, 4: 3.
- Das G.P., Mishra N.R., Maharana N. (2019): Employee relationship management (ERM) and its significance – A systematic review. *Pacific Business Review International*, 12: 96–107.
- Dibiku M.G. (2023): How salary and supervision affects turnover intention through job satisfaction the case of industrial zone located in Ethiopia. *Journal of Human Resource Management*, 26: 12–22.
- Eurostat (2024): Employment – Annual Statistics. Available at https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Employment_-_annual_statistics (accessed Jan 5, 2024).
- Globočnik Žunac A. (2024): The well-being equation: Investigating critics, negative emotions, and demotivation in the workplace. *Central European Business Review*, 13: 105–121.
- Goel N., Rashmi K. (2023): Impact of motivation on employee engagement: A literature review. *Journal of Statistics and Management Systems*, 26: 537–547.
- Gottwald D., Svadlenka L., Lejskova P., Pavlisova H. (2017): Human capital as a tool for predicting development of transport and communications sector: The Czech Republic perspective. *Communications – Scientific Letters of the University of Zilina*, 19: 50–56.
- Gottwald D., Zákorová E., Švadlenka L., Pavlisová H. (2018): Approach to human capital in National Postal Providers: A cross-country analysis in Europe. *Promet – Traffic and Transportation*, 30: 623–633.
- Hitka M., Ližbetinová L. (2023): Human potential of talents in agriculture and forestry in context of Agriculture 4.0. *Agricultural Economics – Czech*, 69: 223–233.
- Hitka M., Lorincova S., Gejdos M., Lipoldova M. (2022): Employee motivation during the time of the crisis in agricultural and forestry organizations: Case study. *Agricultural Economics – Czech*, 68: 271–281.
- Jankelová N., Joniaková Z., Romanová A., Remeňová K. (2020): Motivational factors and job satisfaction of employees in agriculture in the context of performance of agricultural companies in Slovakia. *Agricultural Economics – Czech*, 66: 402–412.
- Jankelová N., Joniaková Z., Procházková K. (2022): The way to business competitiveness: The importance of diversity management and teamwork climate in stabilizing of employees. *Journal of Business Economics and Management*, 23: 606–625.
- Jarkovská P., Jarkovská M. (2024): Employee motivation in contemporary academic literature: A narrative literature review. *Organizacija*, 57: 185–201.
- Jeki S., Sulastri (2019): The effect of human capital, motivation and job satisfaction on employee performance: A literature review. In: Patrisia D., BinIsmail M., Imran M., Briggs M., Ardi H., Marna J.E., Handayani D.F., Sari Y.P., Pebriyani D., Lasmini R.S., Thaib I. (eds): *Proceedings of the Third Padang International Conference On Economics Education, Economics, Business and Management, Accounting and Entrepreneurship (PICEEBA 2019)*, 97: 788–795.
- Karacsony P., Vinichenko M.V. (2021): Analysis of the motivation of agricultural workers in Bulgaria and Hungary. *Bulgarian Journal of Agricultural Science*, 27: 479–486.
- Karimi S., Malek F.A., Farani A.Y. (2022): The relationship between proactive personality and employees' creativity: The mediating role of intrinsic motivation and creative self-efficacy. *Economic Research – Ekonomika Istraživanja*, 35: 4500–4519.
- Kohnová L., Stacho Z., Salajová N., Stachová K., Papula J. (2023): Application of agile management methods in companies operating in Slovakia and the Czech Republic. *Economic Research – Ekonomika Istraživanja*, 36: 2142809.
- Kucharcikova A., Miciak M., Malichova E., Durisova M., Tokarcikova E. (2019): The motivation of students at universities as a prerequisite of the education's sustainability within the business value generation context. *Sustainability*, 11: 5577.
- Kumlander D. (2015): Self-organized teams: A contradictory technique to motivate personnel. In: Sobh T., Elleithy K. (eds): *Innovations and Advances in Computing, Informatics, Systems Sciences, Networking and Engineering*. City, date: 379–383.
- Maj J. (2023): Influence of inclusive work environment and perceived diversity on job satisfaction: Evidence from Poland. *Central European Business Review*, 12: 105–122.
- Mandal S., Das P., Menon G.V., Amritha R. (2023): Enablers of work from home culture: An integrated empirical framework. *Benchmarking*, 30: 1231–1258.

<https://doi.org/10.17221/118/2024-AGRICECON>

- Martínez-Cañas R., Ruiz-Palomino P., Jiménez-Moreno J.J., Linuesa-Langreo J. (2023): Push versus pull motivations in entrepreneurial intention: The mediating effect of perceived risk and opportunity recognition. *European Research on Management and Business Economics*, 29: 100214.
- Mironova N.N., Zhrebtsov V.I., Sviridovskaya E.V. (2021): The remuneration system for agricultural workers from the perspective of their work motivation. In: Bogoviz A.V. (ed.): *Complex Systems: Innovation and Sustainability in the Digital Age*. Cham, Springer: 443–448.
- Nasir, Burhanuddin Tola, Wibowo (2019): The effect of competence and compensation on the performances of agricultural extension employee in Banten province of Indonesia in digital era 4.0. *International Journal of Recent Technology and Engineering*, 8: 441–446.
- Oladimeji K.A., Abdulkareem A.K., Ishola A.A. (2023): Talent management, organizational culture and employee productivity: The moderating effect of employee involvement. *Journal of Human Resource Management*, 26: 43–56.
- Pincus J.D. (2023): Employee engagement as human motivation: Implications for theory, methods, and practice. *Integrative Psychological and Behavioral Science*, 57: 1223–1255.
- Pogorelskaia I., Várallyai L. (2020): Agriculture 4.0 and the role of education. *Journal of Agricultural Informatics*, 11: 45–51.
- Pohanková A. (2009): Motivation program as basis for successful motivating in the organization. *Human Resources Management and Ergonomics*, 3: 66–75.
- Siejka S., Szajt M. (2022): Impact of Covid-19 pandemic on the hierarchy of motivating factors among sales department employees. *Polish Journal of Management Studies*, 26: 310–329.
- Smerek L., Vetráková M. (2020): Difference in human resources development in various types of companies. *Polish Journal of Management Studies*, 21: 398–411.
- Statistical Office of the SR (2022): Work statistics. Available at https://slovak.statistics.sk/wps/portal/ext/themes/demography/labour/indicators!/ut/p/z1/IZJNU4MwEIZ_Sw9ck4VAAG8B5UsGKZQWc3GggxSnQIeijP9eSr04ox-T3lsnz7GbeLOY4xbzJPqoy66u2yY7j-ZnTl60faoYhMrD-VjQhuEMTJVlsTKhG8mwD4oxhgvsRfq-4V0ILOAdwNC-3Ik0WQlcm34lBiumyb99GTNV (accessed Feb 1 2024; in Slovak).
- Statistical Office of the SR (2024): Datacube – employment. [Dataset.] Available at https://datacube.statistics.sk/#!/view/sk/VBD_SLOVSTAT/pr2003qs/v_pr2003qs_00_00_00_sk (accessed Jan 13, 2024; in Slovak).
- Tokarcikova E., Malichova E., Kucharcikova A., Durisova M. (2020): Importance of technical and business skills for future IT professionals. *Amfiteatru Economic*, 22: 567–567.
- Trexima (2020): National Project Forecasts of the Development of the Labor Market in SR II: Comprehensive Analysis of Employment and Verification of Forecasts in 2019. Available at https://www.upsvr.gov.sk/statistiky/narodny-projekt-prognozy-vyvoja-na-trhu-prace-v-sr-ii.html?page_id=798175 (accessed Feb 15, 2024; in Slovak).
- Urbancová H., Vrabcová P. (2022): Activities of the human resources department influenced by the organizational culture. *Ekonomický Casopis*, 70: 76–93.
- Verdugo-Castro S., García-Holgado A., Sánchez-Gómez M.C. (2022): The gender gap in higher STEM studies: A systematic literature review. *Heliyon*, 8: e10300.
- Vinš M., Durec D. (2021): Attitudes of Czech and Slovak young professionals towards potential new entrants in the automotive industry. *Perner's Contacts*, 16: 8.
- Vlacsekova D., Mura L. (2017): Effect of motivational tools on employee satisfaction in small and medium enterprises. *Oeconomia Copernicana*, 8: 111–130.
- Yekimov S., Leonidov I., Smyrnov I., Karmannyi Y., Kovzhoha S. (2020): Motivating the administrative staff of agricultural enterprises during remote work during the pandemic Covid-19. *E3S Web of Conferences*, 222: 06017.
- Yekimov S., Kazachuk I., Glukhikh N., Shibakova L., Nemudraya E. (2021): The use of socionics in the motivation of personnel in agricultural enterprises. *E3S Web of Conferences*, 273: 08071.
- Yildirim I., Han M. (2023): Determining The motivation levels of the employees in the forest products industry. *BioResources*, 18: 7856–7876.

Received: March 27, 2024

Accepted: November 27, 2024