External and internal entropy assessment on farms in relation to their competitiveness

Hodnocení externí a interní entropie zemědělských podniků ve vztahu k jejich konkurenceschopnosti

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Abstract: Internal and external entropy are indicators of evaluation of the success of the firm management. The evaluation of the file of the chosen agricultural firms shows, that the level of internal and external entropy is not too high for the future dynamics and development. Competitiveness of the evaluated firms can be influenced especially by problematic level of their interior social situation (it means social subsystem measured with the help of the internal entropy) that is connected with a not very efficient management of the human resources.

Key words: entropy, management, agriculture, competitiveness

Abstrakt: Úroveň interní a externí entropie patří k základním ukazatelům hodnocení úspěšnosti řízení podniků a tím i jeho konkurenceschopnosti. Entropie představuje v tomto pojetí jistou míru neuspořádanosti podniku, která může vést ke snížení jeho výkonnosti. V předloženém příspěvku je popsána a vyhodnocena míra entropie u vybraných zemědělských podniků. Z hodnocení úrovně jejich řízení vyplývá, že úroveň jejich vnitřní, vnější a celkové entropie není příliš příznivá pro jejich další dynamiku a rozvoj. Ze sledovaných ukazatelů se jeví jako problematická zejména úroveň vnitřní entropie (hodnota sociálního subsystému). Její zlepšení spočívá ve zefektivnění řízení lidských zdrojů.

Klíčová slova : entropie, řízení, zemědělství, konkurenceschopnost

INTRODUCTION

Agricultural enterprises went through a relatively great development in the past. It is necessary to improve more and more their systems of management for their future development and operation, of course besides other influences. This article describes the system of evaluation of the level of product and potential of the firm with the help of evaluation of the external and internal entropy. These indicators are ones of those evaluating the success or failure of the management of these firms.

REVIEW OF LITERATURE

The level of external and internal entropy belongs according to Kopčaj (1999) to the basic indicators of assessment of the management successfulness and the competitive level of enterprises. The entropy represents measure of the non-systematic character of the enterprise, which can lead to decrease of its productivity and to the end its competitive ability.

The specific characterising of global markets is a certain measure of turbulence (Drucker 1995; Gibson 1998) meaning the lowered ability or foreseeing of the future (this process must have an influence on agricultural enterprises, too). There is a possible strategy for trade in global market to improve flexibility and adaptability of relevant enterprises. It is impossible without a highly functional technical subsystem on one hand and high qualification and personal motivation of every employee on the other hand. We can assess the quality of both systems by the means of indicators of internal and external entropy.

METHODS

The assessment of internal and external entropy was provided by the methodology of Kopčaj (1999). The external entropy is measured as an estimation of level of individual enterprise processes (like marketing, sale, economy, finance etc.) in comparison with the best competitor (1 is the full insufficiency of enterprise, 0 then its full excellence).

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The manager estimates the internal entropy in the similar way. The internal entropy conveys the percentage of frequency of several types of employee (from co-entrepreneur to person concentrated on himself – Table 1).

The sum of types I and II (co-entrepreneur + improver) conveys the level of development of the firm's ideology. The employees work according to the motto "I want subjectively" and are able to use opportunities from the surroundings for the enterprise. The sum of types IV and V represents then the firms' policy and the employees are managed according to the motto "I must not do objectively" and "I must do objectively". The closing objective of management should be the transformation of the best count of employees from group IV, V to group I, II.

The sums of types I, II and IV, V are drawn in conform with the methodology in Figure 1 and subsequently knocked off value of the internal entropy. This value represents average of the level of firm ideology and firm policy.

The data file covers 11 agricultural enterprises of the districts České Budějovice and Český Krumlov. These enterprises operate in less favoured areas in the altitude 500–850 m. The enterprises originated mainly by transformation of the former agricultural co-operatives or their parts or by privatisation of the former state farms.

RESULT AND DISCUSSION

The per cent frequency of several types of employees is described in Table 2. There it results from the average values that the selected enterprises employ 3% of co-entrepreneurs, 14.5% of improvers, 50% of fillers, 27.5% of half-fillers and 5.1% of egocentric people.

Table 1. Five types of employees and stability (arranged by Kopčaj 1999)

Types of employee	I co-enterpreneur	II improver	III filler	IV half-filler	V egocentric man
Measure of stability	stable bend	stable focus	non-stable focus	non-stable bend	totally non-stable
Restrictions	assigns himself	sticks	sticks	forced sticks	non-sticks
Directives	assigns himself	fill	fill	forced fill	non-fills
Threats	changes to opportunities	minimises	solves with manager	converts to enterprise	converts to enterprise
Opportunities	takes advance for enterprise	takes advance for enterprise	does not take advance	takes advance for himself	rips off enterprise

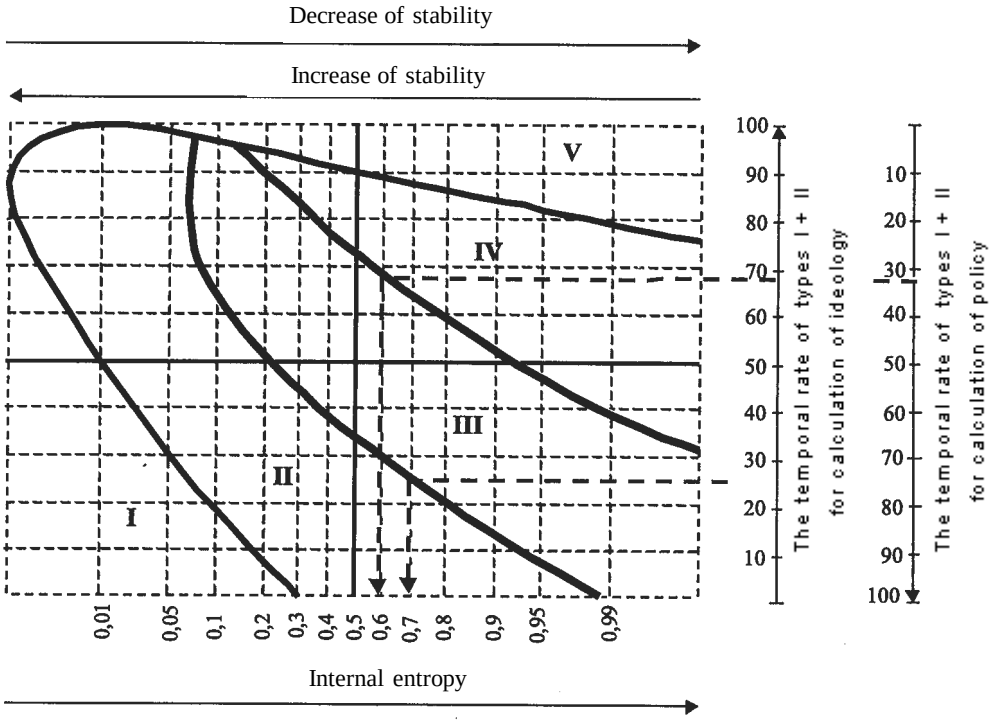

Figure 1. Stability of social subsystem (Kopčaj 1999)

Table 2. Frequency of different types of employees in the selected agricultural enterprises (in %) – employees without management

Type of employee	Enterprise											Average
	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	
I Co-entrepreneur	0.0	14.7	0.0	0.0	0.0	0.0	0.0	8.0	0.0	0.0	10.3	3.0
II Improver	20.6	25.3	0.0	21.4	3.0	0.0	20.0	8.0	16.7	14.3	29.9	14.5
III Filler	54.0	49.3	26.1	50.0	45.5	50.0	70.0	40.0	83.3	42.9	39.3	50.0
IV Half-filler	15.9	10.7	73.9	28.6	45.5	44.7	10.0	40.0	0.0	21.4	10.3	27.4
V Egocentric man	9.5	0.0	0.0	0.0	6.1	5.3	0.0	4.0	0.0	21.4	10.3	5.1
Total	100	100	100	100	100	100	100	100	100	100	100	–

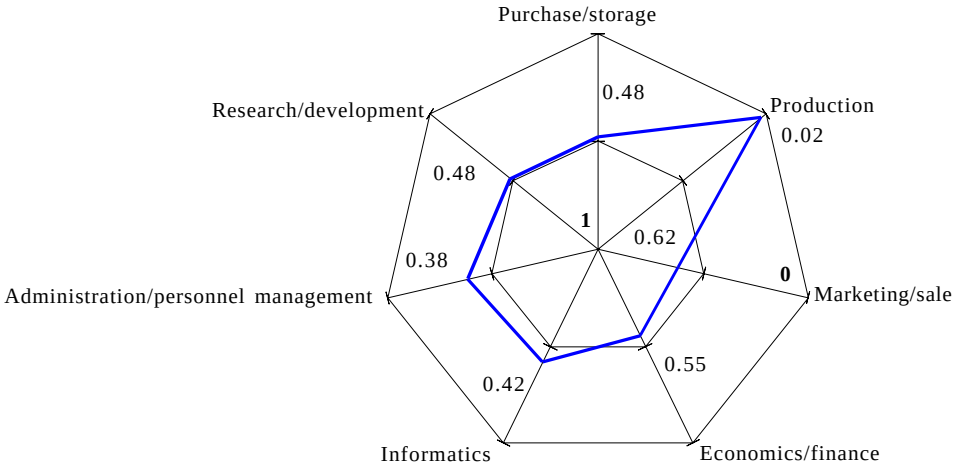

Figure 2. Chart of technical subsystem of chosen agricultural enterprises

It is in average 17.5 % of co-entrepreneurs and improvers (types I + II) and 32.5% half-fillers and egocentric people (IV + V). We can reason therefore that there is obtained in the frame of running agricultural enterprises the orientation of management to the firm policy ("I must not do objectively", "I must do objectively"). For it is the typical passivity of employees concerning the interests of enterprise (the employees transfer risks to enterprise, opportunities to themselves) and the forced abidance of forbiddances and commands.

The measure of internal entropy reaches in the average for the explored enterprises the value of 0.72. This value is relatively high and it exceeds the measure of internal entropy ascertained by Kopčaj (1999) by industrial enterprises (0.65). It is thus the under average level of stabilisation of the social subsystem, which is one of the important reasons of the potential failure of the selected agricultural enterprises.

There results from the assessment of technical subsystem (Figure 2), that the agricultural enterprises excel in production as the enterprise process (the value of entropy is 0.02). Their weaknesses is, however, marketing/sale (the value is 0.62) and economics/finance (the value 0.55). The average value of external entropy is on the level 0.42. It represents a higher level of technical subsystem in comparison with industrial enterprises (entropy is 0.55; Kopčaj 1999).

The total level of entropy achieved for the data file of enterprises reaches the level 0.84. This level is comparable to the level of average Czech industrial enterprises ascertained Kopčaj (1999). It does not, however, guarantee the progress of agricultural enterprises to the first league (group) of excellence, if the current course is prolonged without change.

CONCLUSION

The level of internal, external and the total entropy is not, according to the assessment of the present level of the selected agricultural enterprises, any too favourable for their future dynamics and development. The agricultural enterprises reach values of the total entropy comparable to the industrial firms, the values of external entropy are slightly higher, the problem is, however, the level of internal entropy. We can evaluate the present

level of agricultural enterprises in the whole context as unsatisfactory. Competitiveness of the reviewed enterprises is thus designated to a considerable measure without influence of the surroundings as well as the problematic level of internal entropy. Internal entropy can be better influenced by the management of agricultural enterprises.

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