

Savov, Radovan; Chebeň, Juraj; Lančarič, Drahoslav; Serenčėš, Roman

Article

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MBNQA APPROACH IN QUALITY MANAGEMENT SUPPORTING SUSTAINABLE BUSINESS PERFORMANCE IN AGRIBUSINESS

Radovan Savov¹, Juraj Chebeň^{*2}, Drahoslav Lančarič³ and Roman Serenčేశ⁴

¹⁾³⁾⁴⁾ *Slovak University of Agriculture in Nitra, Slovakia*

²⁾ *Academy of Media Studies, Bratislava, Slovakia*

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Abstract

Despite attention being paid to quality management in the literature, little empirical research has been conducted on developing the link between adoption of quality management approach and business performance in agricultural enterprises, and moreover, only a few empirical studies have investigated this issue in Central and Eastern Europe. The conducted empirical survey examines the relationship between adopting the quality management approach and business performance from the perspective of agricultural enterprises in Slovakia. The empirical findings are based on 70 responses from agribusinesses in Slovak Republic. To measure the adopting of quality management approach the MBNQA model was used. The authors have used linear regression as an evaluation method. Based on the results it can be concluded the adopting of quality management approach is determined by ownership. The enterprises owned by the owner from abroad adopt the quality management approach more readily than the domestic ones. The size of the enterprise and type of production do not determine the adopting of quality management approach in the agricultural enterprises in the Slovak Republic. This study contributes to the European research that studies the relation between quality management and business performance of agribusinesses by means of an empirical investigation in agricultural organizations in a transition economy such as Slovakia.

Keywords: MBNQA model, quality management, business performance, agribusiness

JEL Classification: Q13, M11, O13

* Corresponding author, **Juraj Chebeň** – j_cheben@yahoo.com

Introduction

Since 1989 majority of Central and Eastern European countries have gone through many democratic reforms which stimulated economic liberalization in the agricultural sector (Deininger, 2003; Swinnen and Rozelle, 2009). Another historical milestone was joining the European Union in 2004. Since becoming the EU member state, the agribusinesses in Slovakia are challenged by cheaper products and products of superior quality from other member states. Some agribusinesses have responded to this challenge by embracing a broader view of quality. The firms began to stress the management of quality in all phases and aspects of the business. Some of the major concepts that are introduced in the strategic quality management approach are: reduction of variation, continuous improvement of products and services to meet customers' needs, costs of ensuring quality and costs emerged because of poor quality, cross functional management systematic approach to quality, competitiveness, profitability, quality planning and organization wide commitment. Successful implementation of strategic quality management is not an easy task and changes are required. However, the implementation process in some companies is more difficult than in others. We presume that in agriculture it can be determined by a) the size of the farm (measured by the utilized area), b) the type of production (the specialization towards live or crop production) and c) the ownership structure of a farm (foreign capital). The role of quality management in the company is to improve the business performance. The importance of using quality management standards such as ISO 9000, therefore, cannot be ignored (Najmi and Kehoe, 2001; Gotzamani et al., 2007; Magd, 2008).

The agriculture in Slovakia is specific in many regards (Ciaian et al., 2009; Pokrivčák and Rajčániová, 2014). In Western Europe, the USA and other developed countries the agricultural sector is usually dominated by relatively small family farms. The situation is different in Central and Eastern European countries (CEEC) where a dual structure of farms exists and there are large corporate farms and relatively small family farms (Ciaian et al., 2009). Agriculture in Central and Eastern European countries is also a much more important component of the economy than in industrialized countries. It traditionally accounted for 15-20% of GDP and total employment, compared to only 2-3% in the EU (Klomp, 2014).

The quality in agriculture is usually dealt with from the point of view of water and soil quality (da Silva et al., 2015) and food quality and safety (Carvalho, 2006; Kafetzopoulos and Gotzamani, 2014). The literature exploring the quality management approach in agriculture is lacking (especially in CEEC). This paper extends the existing research on quality management in agriculture by examining the impact of selected factors on adopting the quality management approach in agricultural companies and examining the link between adoption of MBNQA quality management model approach and business performance in agricultural enterprises. According to our observations we can state that there are only few agribusiness companies in Slovakia with implemented TQM model with mostly positive managerial experience. TQM implemented in these companies brought them more transparency, better processes, quality and efficiency improvements; this is visible mainly in the area of planning, logistics and sales. The only negative experience is connected with longer TQM implementation time.

The rest of the paper is structured as follows: section 2 reviews the empirical literature on management of quality, section 3 presents the data and the methodology, in section 4, empirical results are summarized and implications are discussed, section 5 concludes the paper.

1. Literature Review

With increased access to information, with a strong desire for knowledge, and with increased standards, both companies and consumers pay an important attention to quality and information technologies, which are, on the one hand, a sure path to success for an entrepreneur and, on the other hand, the confirmation of a correct choice for a consumer (Dinu, 2011, p.667; Dabija and Băbuș, 2014). Due to the growing demands of customers and several food crises, quality assurance schemes have become increasingly popular in agribusiness. Whereas in the beginning, certification systems emphasized pure product control, these days such systems seek to establish comprehensive quality management (Schulze et al., 2008). Although some previous research has focused on the use of quality management systems in agribusiness, we can hardly find a research which would analyse the effectiveness and efficiency of MBNQA within a performance framework in agribusiness. It specifically deals with application of MBNQA model in agribusinesses in a transition economy and this kind of research was not conducted in the sector of agriculture.

1.1 Quality management

Total quality management (TQM), as a tool created to manage and to control quality, is an approach to management embracing both social and technical dimensions aimed at achieving excellent results effectively and efficiently, which needs to be put into practice through a specific framework. Most TQM definitions emphasize the concepts such as continuous improvement, customer focus, human resource management and process management. Some authors also include soft and hard TQM elements, organization performance and benchmarking as well (Talib et al., 2012, p.264). According to Rungtusanatham et al. (2005) when applying TQM model cultural differences should not be neglected.

TQM seeks to integrate all organizational functions to focus on meeting and surpassing customers' requirements and organizational objectives. TQM empowers every member of the organization and offers the opportunity to participate, contribute and develop a sense of ownership. It is intended to promote continuous, sustained and long-term improvement in quality and productivity, and eliminate employees' fear of change (Talib et al., 2012, p.260). There are two broad dimensions of TQM: social (soft) and technical (hard) (Lewis et al., 2006; Fotopoulos and Psomas, 2009; Psomas et al., 2014). Social part of TQM deals with human resources management and includes leadership, teamwork, employee support, employee engagement, employee empowerment, top management commitment, strategic quality planning, employee involvement, supplier involvement. Technical part is focused on improving production methods, benchmarking, control charts, procedures to make improvement of goods and services towards customers. According to Zairi and Thiagarajan (1997) the "social" TQM elements are long-standing concerns and cannot be exploited after an organization's TQM implementation and they should be reinforced by the "technical" elements of TQM (Zairi and Thiagarajan, 1997). The "soft" TQM elements have a significant direct impact on quality improvement, employee benefits and customer satisfaction. However, the impact of the "hard" TQM elements on the above quality management benefits is not direct but indirect, through their significant correlation with the "soft" TQM elements. Therefore, food companies should accept the leading role of the "soft" aspect of TQM and the supporting role of the "hard" aspect in maximizing the

quality management benefits. Quality improvement is also a significant factor that directly influences employee benefits, customer satisfaction and business performance (Psomas et al., 2014, p. 431).

A quality improvement and the consolidation of the company's market position are influenced mainly by adopting "soft" TQM elements and secondarily "hard" TQM elements. Quality tools usage alone cannot lead a company to continuous process improvement, customer satisfaction and consolidation of its market position, without the proper guidance by top management and employee and supplier support (Fotopoulos and Psomas, 2009). TQM can also facilitate decision-making process and simplify problem solving processes because it serves as standardized guideline for managers. An exhaustive list of benefits of TQM (e.g. improved financial performance and improved process management, increased social responsibility and ethics) as reported in literature can be found in Talib et al. (2012, p. 265). Živanović et al. (2015) have researched that in the area of agriculture the great success achieved in outcomes in Serbia was based on the application of techniques of TQM. They also state that although there are many followers who suggest using TQM, there are obstacles to the implementation of TQM, as a result of increased costs.

There are no direct financial supports for adopting TQM in the organization on EU's policy part in the agricultural sector. Nevertheless, there are some minor nonproduction subventions which can be used for quality improvement. Common Agricultural Policy (CAP) has changed support based on product to subventions based on producer through main policy objectives such as viable food production, sustainable management of natural resources and climate action, and balanced territorial development. The main task of these objectives is to face enhanced competition, improved sustainability, and greater effectiveness (European Commission, 2013). Based on this logic we could say that the influence of EU decisions in area of CAP is much more significant than the implementation of TQM for the company's performance.

1.2 Drivers of TQM and evaluation quality systems

Economical and organizational factors are the most significant incentives required to motivate the food industry to adopt ISO 14001 (Massoud et al., 2010). Managerial requirements in order to ensure the quality of production are published in international standard ISO 9000:2015 that describes requirements on quality management systems and ISO 9004:2009 which focuses on how to make a quality management system more efficient and effective along with managing sustainable success of an organization ISO (2016).

The main driver to Quality management system implementation is effectiveness of all operations within the organization as well as productivity enhancement. The increase of productivity and profitability is linked to savings that support a competitive advantage of a company. Prajogo and Sohal (2003) recognize TQM is known worldwide as a tool that provides a company with a competitive advantage. To achieve a sustainable competitive advantage a TQM culture is primarily required Fotopoulos and Psomas (2009). Quality management systems aim to ensure highly competitive and consistently high quality products or services and a better corporate image that subsequently could lead to market share increase or market expansion. These quality management models are increasingly

more important in period of globalization where competitors can easily emerge from a country all over the world.

Foreign capital that exceeds 51% in the company also contributes to eagerness to implement TQM system. According to Wali (2010), firms which implemented TQM are characterised by a participating leadership, have a good experience in quality, have good partnership relations and mainly belong to a multinational group will display a more open attitude towards change and innovative organizational practices. Adoption of Quality assurance systems by small food enterprises can be influenced by perception of internal and external benefits, by type (kind) of production, costs of TQM implementation, organizational quality culture, reduction of controls and inspections, reduction of non-conformities, cohesion inside organization, customers' satisfaction, corporate image, the positioning in the market place compared to the competition, impact of a poor quality on company's performance, quality goals in company, and supply chain partners (Karipidis et al., 2008).

Size of a company plays also a significant role in Quality assurance system implementation. Small food companies are keener on implementing Quality assurance systems than large companies or public organizations which are mainly food distributors, retailers, manufacturers, hospitals or restaurants (Rodrings-Escobar et al., 2006). Implementation of quality assurance models can be also based on company's managerial strategy that could focus on high-end quality products for premium prices, customers' trust increase with highly reliable products, reputation increase promoted by exceptional quality of products (Hooker and Caswell, 1999). Strategic orientation of an organization (cost leadership, market differentiation and focus strategy) is a moderating factor influencing the relationship between registration to a quality model system such as the ISO 9000, and the organization's financial performance (Dimara et al., 2004).

Following international food sector trend, improving environmental performance and enhancing company image are the most salient drivers to adopt ISO (Massoud et al., 2010)

Implementation of quality models based on *ISO norms*, *national agrifood certification systems*, *GLOBALGAP* (*Global standard that assures food safety and sustainability*), *BRC Global Standard* (*Safety and quality certification programme especially for retailers*), *TQM system*, *European Quality Award* (*European Foundation for Quality Management – EFQM*) model or *Malcolm Baldrige National Quality Award (MBNQA)* model has also been driven by stakeholders' preferences, especially by customer requirements. In some cases these models help to overcome import barriers or regulations created by governments in order to protect their national markets. According to Massoud et al. (2010) the lack of government support and stakeholder demand as well as the fact that ISO 14001 is not a legal requirement constitute the most salient factors hindering the adoption of the standard.

Last, but not the least important drivers to widely implement a quality model in the company can emerge from innovation performance, supply chain partners, and international sector trend. According to Prajogo and Sohal (2003, p.914) TQM significantly and positively contributes to innovation performance, in terms of both product and process. Its contribution to innovation performance, however, seems to be inferior to that of quality performance. The achievement of quality performance as a result of the implementation of TQM practices does, to certain degree, lead to realization of innovation performance.

The continuous improvement tools that are typically presented in studies associated with the supply chain and operations, such as that conducted by Foster et al. (2011), include the following: Six Sigma, FMEA (Failure Mode Effect and Analysis), PDCA (Plan-Do-Check-Analysis), lean tools (Kaizen), control charts and SPC (Statistical Process Control), 5S, DOE (Design of Experiment), QFD (Quality Function Deployment), and QC (Quality Control) Story (Mayer et al., 2016). ISO and TQM have inspired quality award models that present powerful tools for effective management of product or service quality in modern organizations. The most known and basic quality models (systems) that outline requirements for organizations in quality management are ISO, TQM, EFQM in Europe, MBQNA in USA, Deming prize (PDCA) in Japan. The exhausting list of different quality assurance systems has been presented in Theuvsen and Spiller (2007, pp.14-15). Their categorization is according to: degree of harmonization, geographic focus, number of participating firms, and area of application: local, national, international, and other criteria presented in table no. 1.

Service quality models are reviewed in the work by Tachiciu and Dinu (2010). Dudin et al. (2014) have revealed that further stimulation of sustainable development of the world's agribusiness can be performed through total quality management as well. For agricultural companies, quality management should be based on the Deming Cycle concept.

Table no. 1: Examples of different quality assurance systems

criteria	Categories	Examples of quality systems
focus	<ul style="list-style-type: none"> • product characteristics and documentation standards • <i>process characteristics</i> • system characteristics 	<ul style="list-style-type: none"> ➤ Qualität und Sicherheit in Germany, British assured farm standards, Protected Designation of Origin (PDO), Protected Geographical Indication (PGI) ➤ <i>environment-friendly, welfare standards</i> ➤ IFS
target group	<ul style="list-style-type: none"> • consumer-oriented schemes • business-to-business standards 	<ul style="list-style-type: none"> ➤ organic farming, Fairtrade ➤ EurepGAP, IFS, GLOBALGAP, BRC Global Standard, ISO
goal	<ul style="list-style-type: none"> • guarantee of legal minimum requirements in a mass market • product differentiation 	<ul style="list-style-type: none"> ➤ IFS, IKB in the Netherlands, QS in Germany ➤ PDO, PGI, TSG, organic farming schemes
content	<ul style="list-style-type: none"> • product quality • <i>process quality</i> • product safety 	<ul style="list-style-type: none"> ➤ PDO schemes ➤ <i>organic farming standards</i> ➤ IKB
standard owner	<ul style="list-style-type: none"> • state-run systems • <i>international standard owner standardization organisations</i> • <i>stakeholder approaches</i> • retailer driven schemes 	<ul style="list-style-type: none"> ➤ organic farming in Denmark ➤ <i>ISO 9001 and ISO 22000</i> ➤ <i>Fairtrade</i> ➤ BRC Global Standard and IFS

Source: own adaptation after Theuvsen and Spiller, 2007, pp.14-15

In order to enhance the supply chain performance and to ensure continuous improvement of an organization, Lin et al. (2013) propose to use quality management models, such as ISO 9000, EFQM Excellence model, and MBNQA model. Some quality award models are used as a guide to TQM implementation by a large number of organizations (Bou-Llusar et al., 2009). Variety of researchers has considered quality models as operational frameworks for TQM and for higher performance (Bohoris, 1995; Van der Wiele et al., 2000; Yong and Wilkinson, 2001; Lee et al., 2003).

1.3 Malcolm Baldrige National Quality Award

The quality in the company should be evaluated by the more models, such as the Deming Prize, EFQM Excellence Model, and the MBNQA. The main idea of these models is to create competitive advantage based on improvement of all activities in small, medium, and large enterprises (Rehor et al., 2014). Quality management models are used as a guide to TQM implementation by a large number of organizations. Findings of Bou-Llusar (2009) support the EFQM Excellence Model as an operational framework for TQM, and also reinforce the results obtained in previous studies for the MBNQA, suggesting that quality award models really are TQM frameworks.

Malcolm Baldrige National Quality Award was created in 1987 by the U.S. Commerce Department and established by U.S. Congress in the same year in order to raise awareness of quality management and to encourage the American businesses and all other organizations to practice an efficient control of quality for products and services (Bujna et al., 2012; Korenko et al., 2013). The model was created to offer an excellence quality standard and also to help companies to achieve a high level of performance (Garvin, 1991). The Malcolm Baldrige National Quality Award (MBNQA) has evolved from a mean of recognizing the best quality management practices to a comprehensive framework for world class performance, where it is widely used as a model for process improvement (Flynn and Saladin, 2001).

Winn and Cameron (1998) examine the validity of the proposed relationships among the MBNQA dimensions. Research of Curkovic et al. (2000) shows that MBNQA and its criteria do capture TQM core concepts. Wilson and Collier (2000) empirically test the relationships between the Baldrige Award constructs. Goldstein and Schweikhart (2002) investigate the extent to which the improvement of Baldrige criteria leads to improved results. Lee et al. (2003) and Sun (2011) test the link between MBNQA criteria and performance. Flynn and Saladin (2006) analyze the relevance of MBNQA model application framework across national cultures and Kull and Wacker (2010) inspect the impact of national culture on quality management effectiveness.

MBNQA is a model of excellence to recognize best practices in management of the companies. Application of this model is based on seven criteria: leadership, strategic planning, customer focus, measurement, analysis and knowledge management, human resources focus and performance results. Garvin (1991) described it as "The most important catalyst for transforming American Business." Results of MBNQA criteria can enhance decision making about resource allocations because such measures allow evaluation of processes and a better understanding of the integration among these processes (Prybutok, Zhang and Peak, 2011). The Baldrige award has arguably become one of the most influential vehicles for creating quality awareness and a widely accepted model of performance excellence. It was built upon a set of interrelated core values and concepts that exemplify beliefs and behaviors found in high performing organizations (Flynn and Saladin, 2006).

2. Methodology

The purpose of the study is to evaluate the link between selected drivers (utilized area, type of production, foreign capital) and quality management in agribusinesses in Slovakia. For the purpose of the study the level of adoption of quality management approach is measured

using MBNQA model. The authors assume that MBNQA score indicates the economic performance of the farm. The descriptive (initial mapping of the field) and exploratory (determining the significance of impact of selected drivers and examining the link between MBNQA score and economic performance of the farm) research approaches have been chosen. (Figure no. 1)

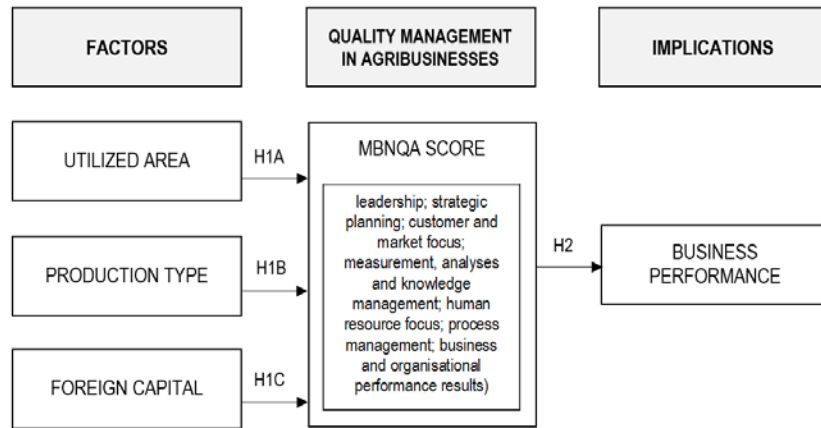


Figure no. 1: Adopting the quality management approach in agribusinesses in Slovakia

We set up following hypotheses:

H_{1A}: The adopting of concept of quality management in agribusinesses in Slovakia is affected by utilized area.

H_{1B}: The adopting of concept of quality management in agribusinesses in Slovakia is affected by their type of production.

H_{1C}: The adopting of concept of quality management in agribusinesses in Slovakia is affected by the foreign capital.

H₂: The achieved MBNQA scores sufficiently indicates the economic performance of agribusinesses in Slovakia.

To evaluate the influence of selected drivers (independent variables) the authors used linear regression. The dependent variables are MBNQA scores in the individual areas (leadership; strategic planning; customer and market focus; measurement, analysis and knowledge management; human resource focus; process management; business performance results) and the overall MBNQA score. Independent variables are: foreign capital (**FOR_C**); type of production (**TYP_P**); certificated system of quality (**QUA_S**); utilized area (**UT_A**). The functional form of regression is as follows:

$$\text{leadership} = \beta_0 + \beta_1 \text{FOR_C} + \beta_2 \text{TYP_P} + \beta_3 \text{QUA_S} + \beta_4 \text{UT_A} + \varepsilon \quad (1)$$

$$\text{strategic planning} = \beta_0 + \beta_1 \text{FOR_C} + \beta_2 \text{TYP_P} + \beta_3 \text{QUA_S} + \beta_4 \text{UT_A} + \varepsilon \quad (2)$$

$$\text{customer and market focus} = \beta_0 + \beta_1 \text{FOR_C} + \beta_2 \text{TYP_P} + \beta_3 \text{QUA_S} + \beta_4 \text{UT_A} + \varepsilon \quad (3)$$

$$\text{measurement, analysis and knowledge management} = \beta_0 + \beta_1 \text{FOR_C} + \beta_2 \text{TYP_P} + \beta_3 \text{QUA_S} + \beta_4 \text{UT_A} + \varepsilon \quad (4)$$

$$\text{human resource focus focus} = \beta_0 + \beta_1 \text{FOR_C} + \beta_2 \text{TYP_P} + \beta_3 \text{QUA_S} + \beta_4 \text{UT_A} + \varepsilon \quad (5)$$

$$\text{process management} = \beta_0 + \beta_1 \text{FOR_C} + \beta_2 \text{TYP_P} + \beta_3 \text{QUA_S} + \beta_4 \text{UT_A} + \varepsilon \quad (6)$$

$$\text{business performance results} = \beta_0 + \beta_1 \text{FOR_C} + \beta_2 \text{TYP_P} + \beta_3 \text{QUA_S} + \beta_4 \text{UT_A} + \varepsilon \quad (7)$$

$$\text{total} = \beta_0 + \beta_1 \text{FOR_C} + \beta_2 \text{TYP_P} + \beta_3 \text{QUA_S} + \beta_4 \text{UT_A} + \varepsilon \quad (8)$$

To examine the link between MBNQA score and economic performance the authors used Kruskal-Wallis ANOVA.

2.1 Operationalization of the variables

The operationalization of variables is shown in table no. 2. The questionnaire for data obtaining was based on MBNQA model and included 104 items. These items were divided into 7 categories: leadership; strategic planning; customer and market focus; measurement, analyses and knowledge management; human resource focus; process management; business and organisational performance results (Garvin, 1991).

Table no. 2: The operationalization of the variables

Variable	Measurement
Utilized Area	1=less than 100ha; 2=101ha-1000ha; 3=1001ha-2000ha; 4=over 2000ha
Production Type	1=crop production; 2=animal production; 3=mixed production
Foreign Capital	1=no; 2=yes
Certificated Quality Management System (ISO)	1=no; 2=yes
MBNQA Score	Likert scale; 1=totally disagree, 4=neutral attitude, 7=totally agree
Performance	1=loss; 2=profit

Note: ha=hectares

2.2 Data obtaining

The survey was performed from January 2016 to June 2016. There were 70 valid questionnaires from randomly selected agribusinesses.

The majority of questionnaire items were scaled from 1 to 7 (the Likert-type scale). Value 1 corresponded to the absolute disagreement of the respondent with the statement in the wording of the item (formulated as a positive statement), whilst value 7 corresponded to the absolute agreement of the respondent. The rest of the questionnaire items were categorical (table no. 2).

The reliability of the questionnaire was verified by means of Cronbach's alpha. With regard to the achieved results it is therefore possible to regard the reliability of the measurement instrument as sufficient (table no. 3). The construct validity was verified by means of factor analysis using the varimax rotation of factors. It is the most commonly used method for rotation procedure. Varimax rotation of factors is an orthogonal method of rotation that minimises the number of variables with high loadings on a factor, thereby enhancing the interpretability of the factors (Malhotra and Birks, 2006). The suitability of applying the factor analysis was verified on the basis of Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO test) and Bartlett's test of sphericity. The results of both testing statistical methods were satisfactory (Bartlett's test: $p < 0.05$; KMO test > 0.7). The assumptions of applying the factor analysis were met. The factor analysis identified background factors

which altogether explained almost 70% of the total variance. Based on the fact the identified factors fully correspond with questionnaire's content, we regard the construction validity of the measurement instrument satisfactory (table no. 3).

Table no. 3: Data reliability and validity evaluation

	No. of items	$\alpha^1 > 0.7$	KMO ² > 0.7	χ^2 ; df; p ³	Nr. of factors	Factors cumulative %
Leadership	13	0.889	0.801	564.9; 78; 0.000	3	69.935
Strategic Planning	16	0.939	0.845	795.2; 120; 0.000	4	75.621
Customer and Market Focus	13	0.886	0.830	465.6; 78; 0.000	3	67.242
Measurement, Analysis, and Knowledge Management	15	0.900	0.839	641.1; 105; 0.000	3	65.438
Human Resources Focus	17	0.891	0.822	629.2; 136; 0.000	5	71.364
Process Management	17	0.877	0.788	542.1; 136; 0.000	4	65.982
Business/Organizational Performance Results	13	0.881	0.798	439.7; 78; 0.000	3	63.139

Note: ¹ – Cronbach Alpha coefficient; ² – Kaiser-Meyer-Ohlin coefficient; ³ – p value

2.3 Characteristics of the sample

The certified quality system (ISO) is implemented in 10 agribusinesses (14.5%). Out of total number of 70, the majority of the farms are involved in livestock as well as crop production (65.7%). There are only 2 specialized livestock producers. Only 11.9% of farms utilizes an area smaller than 100 ha. There are 16 farms utilizing area larger than 2000 ha. There are 8 farms owned by owner from abroad. The sample characteristics are summarised in table no. 4.

Table no. 4: Cross-tab: Certified System of Quality, Type of Production, Foreign Capital and Utilized Area

		QUA_S		Total
		yes	no	
TYP_P	crop	2.90%	27.54%	30.43%
	livestock	0.00%	2.90%	2.90%
	mixed	11.59%	55.07%	66.67%
Total		14.49%	85.51%	100.00%
FOR_C	yes	0.00%	11.59%	11.59%
	no	14.49%	73.91%	88.41%
Total		14.49%	85.51%	100.00%
UT_A	less than 100	1.52%	9.09%	10.61%
	101ha-1000ha	3.03%	24.24%	27.27%
	1001ha-2000ha	4.55%	33.33%	37.88%
	over 2001ha	6.06%	18.18%	24.24%
Total		15.15%	84.85%	100.00%

3. Results and Discussion

Authors measured the MBNQA score in the set of agriculture enterprises in Slovakia. In theory, the maximum MBNQA score is 1 (100%), the minimum score is 0 (0%). The higher the score, the more positive self-evaluation of the company is. The calculated MBNQA scores were divided into enterprise categories with respect to surveyed drivers (foreign capital (FOR_C); type of production (TYP_P); certificated system of quality (QUA_S); utilized area (UT_A)). Authors calculated the overall MBNQA score as well as MBNQA score for every category (leadership; strategic planning; customer and market focus; measurement, analysis and knowledge management; human resource focus; process management; business performance results) separately.

Our research calculations show that the most obvious differences in average MBNQA score are based on the foreign ownership of the company. Type of production, certificated system of quality and utilized area do not account for obvious differences in MBNQA score. For evaluation of the statistical significance of the differences simple linear regression was used.

Based on results of tests of robustness it can be concluded the assumption of equal variances was not violated. The authors have applied linear model in order to determine the relations between the total MBNQA score, MBNQA scores in individual categories and selected drivers. The results are given in table 5. The independent variables explain the variance in the range of 15.8 % to 34.8%. These results suggest there are important independent variables which were not included in the model.

There was significant association between FOR_C and the overall MBNQA score ($p = 0.003$). This association was confirmed in each individual MBNQA category. *The hypothesis H_{1C} was confirmed.* We conclude the foreign ownership is a driver of adopting quality management approach in agribusinesses in Slovakia.

The evaluation of the other variables (type of production, certificated system of quality and utilized area) yield mixed results. There is no statistically significant association between type of production (TYP_P), utilized area (UT_A) and overall MBNQA score. *The hypotheses H_{1B} and H_{1A} were not confirmed.* However, the results of regression showed statistically significant associations between production (TYP_P), utilized area (UT_A) and MBNQA score in some individual categories. The type of production statistically significantly associated with categories “process management” and “business/organizational performance results”. Utilized area statistically significantly associated with category “leadership”.

When certificated quality system (QUA_S) concerned, the regression confirmed its significant association with categories “measurement, analysis, and knowledge management” and “process management”. The statistically significant association with overall MBNQA score was not confirmed. (Table no. 5)

To be able to evaluate the link between MBNQA score and economic performance of the agriculture companies the variable MBNQA score was transformed into categorical variable Using quartiles the variable was transcoded 1-4 where 1=the best 25% and 4=the worst 25%.

Table no. 5: Regression of foreign capital, production, certificated system of quality, and utilized area results

		(Constant)	FOR_C	TYP_P	QUA_S	UT_A	R ²
leadership	B	0.605	0.160	-0.002	-0.003	-0.037	0.295
	p level	0.000	0.001***	0.888	0.947	0.030**	
strategic planning	B	0.094	0.322	-0.015	0.008	-0.002	0.348
	p level	0.622	0.000****	0.486	0.873	0.909	
customer and market focus	B	0.226	0.238	-0.034	-0.016	0.006	0.223
	p level	0.248	0.000****	0.126	0.761	0.796	
measurement, analysis, and knowledge management	B	0.548	0.181	-0.019	-0.135	0.008	0.220
	p level	0.008	0.007***	0.386	0.017**	0.737	
human resources focus	B	0.347	0.227	-0.032	-0.061	0.014	0.270
	p level	0.044	0.000****	0.098	0.198	0.484	
process management	B	0.591	0.163	-0.043	-0.109	0.007	0.265
	p level	0.001	0.003***	0.022**	0.017**	0.708	
business/organizational performance results	B	0.504	0.166	-0.038	-0.021	0.015	0.158
	p level	0.005	0.005***	0.044**	0.666	0.448	
total	B	0.457	0.190	-0.029	-0.037	0.005	0.252
	p level	0.003	0.002***	0.084	0.370	0.774	

Note: **** $p < 0.001$; *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$; FOR_C=foreign capital; TYP_P=type of production; QUA_S=certificated quality system; UT_A=utilized area; R²=% of variance explained by the model

The Kruskal-Wallis ANOVA confirmed the existence of statistically significant differences in the given economic performance based on the achieved MBNQA score ($p=0.018$). The companies with higher MBNQA score stated their economic performance as profit more often when compared to companies with lower MBNQA score. *The Hypothesis H₂ was confirmed.* We conclude the MBNQA score indicates the economic performance of agricultural company in Slovakia.

Adopting quality management (QM) approach could be dependent on the number of different factors (number of markets, intensity of quality management implementation). Since differences do exist among firms, it can be expected the impact of QM is different across different firms.

A number of studies examine the effect of QM on economic and financial performance of a firm (Samson and Terziovski, 1999; Hendricks and Singhal, 2001; Douma et al., 2002; Kannan and Tan, 2005). Many studies are dealing with the effect of QM on performance from the perspective of company characteristics. One of the commonly used is its size. The size of a company is usually measured using the number of employees. In agriculture the size of the company is measured by the utilized area (MacDonald et al., 2013). Another broadly used characteristics is the company's ownership (Javorcik, 2004; Cerrato and Piva, 2010). Therefore, we inquired about the ownership of the agricultural enterprises. Another relevant characteristic of an agricultural firm is the type of production (indicating its level of specialization). This characteristics is also often examined (Lemaire et al., 2014).

Even though agriculture has many specifics (Macours and Swinnen, 2000; Latruffe et al., 2012) some results of our study are in line with previously conducted surveys. Similarly to other studies (Girma, 2005; Todo, 2006) we conclude there is spillover of firm's foreign ownership. It takes a form of higher MBNQA score indicating better adoption of quality management approach in enterprises owned by the foreign owner. There is evidence the foreign ownership benefits the domestic firms in terms of higher productivity (Javorcik, 2004) and more effective R&D (Chuang and Lin, 1999). The foreign ownership also influences the attitude towards quality culture (Sun, 2010; Goedhuys and Sleuwaegen, 2013). Usually, the foreign owned companies tend to adopt the concept of quality management more voluntarily compared to domestic ones.

Conclusions

This study examined the influence of selected factors on adopting the quality management approach in agricultural enterprises and the link between adoption of quality management approach and the business performance. To measure the adoption of quality management approach the MBNQA model was used.

Research results proved that the foreign capital can be considered a significant determinant of adopting the quality management approach in the agricultural enterprises. Regression showed us differences in companies with foreign capital in all components of MBNQA. This shows that there is smarter focus on quality in companies where foreign capital is allocated. These companies apply their foreign know-how from abroad. Managers of these companies are strongly focused to meet objectives and reach better economic performance in harmony with high quality processes inside the company. Usually they adopt quality management based on ISO standards which can help to build and improve competitive advantage on the market. Implementing the ISO standards in agribusiness companies in Slovakia should bring companies more opportunities to find business partners abroad and applying MBNQA model will provide companies better financial performance.

The type of production and the utilized area have no significant effect on adoption of quality management approach. We selected these drivers because Slovak agriculture is very specific compared to other countries. Livestock production has decreased and in Slovakia there are farms with a large area that is utilized. We hypothesised that decreasing the livestock production (due to a bad economic performance) should have effect on quality management approach because companies with only crop production have much better economic results. We also presumed that in companies with a large utilized area the quality management approach is more needed than in smaller farms, but these assumptions were not confirmed in our research. The regression analysis showed us that the difference in leadership occurs in companies with a larger utilized area. It confirms the general managerial rule about the type of leadership in small and large companies. Companies with larger area need more workers and they must be lead distinctively. Numbers in research point out that similar evaluation could be adopted in other industries. MBNQA criteria could be used in all kinds of business entities but also in non-profit organizations to improve the quality, regardless of the size of the business.

While this study provides useful findings about adopting the quality management approach by agricultural enterprises in Slovakia, it also has limitations that call for further research. First, the results of regression suggest that there are some factors not included into model.

The number of markets where the enterprise operates could be one of these factors as well as the age of the company. Second, while the MBNQA score indicates the economic performance of agribusinesses, the link between TQM and performance could be strongly mediated by legislation and cultural values in countries where awareness of quality management has been almost non-existent (e.g., former communist countries or certain Asian countries as stated in Kull and Wacker (2010)). Another restriction of fully applying our results is a context limitation and therefore perfect fit of our research results would be within economies in transition where foreign capital enters into market. The number of evaluated companies is not particularly high; therefore results could be slightly different if we researched more companies.

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