Measuring the Impact of ISO 9001 on Employee and Customer Related Company Performance

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ABSTRACT

Purpose: According to ISO 9000:2015 "the primary focus of quality management is to meet customer requirements and to strive to exceed customer expectations", where "a customer can be internal or external to the organization". Internal customers refer to a company's employees, while external customers are the buyers of a company's products and services. Previous research has scrutinised the impact of ISO 9001 on company performance, without clear focus on the performance related to internal and external customers.

Methodology/Approach: The purpose of this paper is to measure the impact of ISO 9001 on the performance to internal and external customers using a survey that has been responded by 141 companies in the Republic of Serbia.

Findings: The results show that quality management system (QMS) certification to ISO 9001 enhances employee- and customer-related company performance, while certification incentives are found to influence this relationship.

Research Limitation/Implication: The data are gathered in only one specific country, although there are no reasons to think that the results could depend of the specific analysed region.

Originality/Value of paper: The main value of the article is to be one of the first ones to analyse, in any way, the impact of QMS on internal and external customers.

Category: Research paper

Keywords: quality management system; ISO 9001; employee performance; customer-related performance; incentives

1 INTRODUCTION

ISO 9001 is an internationally accepted reference standard for quality management system (QMS), helping companies to improve their internal quality in order to achieve customer satisfaction. The total number of ISO 9001 valid certificates as of 31 December 2020 was 916,842 (ISO, 2020). The scope of ISO 9001:2015 sets requirements for a QMS "when an organization: a) needs to demonstrate its ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements, and b) aims to enhance customer satisfaction through the effective application of the system, including processes for improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements". ISO 9000:2015 emphasize that an organization should "recognize direct and indirect customers as those who receive value from the organization". The standard differentiates between external and internal customers, the former being the recipients of a company's products and services, and later being a company's employees, whose needs and expectations also need to be satisfied in order to enhance external customer satisfaction. Customer focus is the first quality management principle aimed to drive the organisation to "increased customer value, increased customer satisfaction, improved customer loyalty, enhanced repeat business, enhanced reputation of the organization, expanded customer base, increased revenue and market share", while „competent, empowered and engaged people at all levels throughout the organization are essential to enhance the organization's capability to create and deliver value" (ISO 9000:2015). Heskett at al. (1994) show that improvement of internal quality, which may be due to ISO 9001 implementation, leads firstly to employee satisfaction, which positively impacts employee retention and employee productivity; as a result, quality of output increases affecting customer satisfaction, and further customer loyalty. Loyal customers repeat purchase and spread a positive word-of-mouth, causing the increase of a company's market share, revenue and profit (Figure 1).

The motivations and outcomes of ISO 9001 have been extensively analysed (for reviews on this topic, see Heras-Saizarbitoria and Boiral (2013), Lushi et al. (2016), Sfreddo et al. (2021)). Nevertheless, there still are many gaps in the literature (Heras-Saizarbitoria and Boiral (2013) and Sfreddo et al. (2021)). Among many others, there is a scarce research analysing the achievement of ISO 9001's main goal. The current study aims to fill this research gap by examining the impact of ISO 9001 on company's performance related to its internal and external customers based on the Heskett et al. (1994) framework, with a special focus on the role of certification incentives.

The remainder of this paper proceeds as follows. Firstly, relevant literature is reviewed and hypotheses are developed. Next, the research methodology is described, followed by the presentation of empirical findings from the Republic of Serbia. Discussion section presents theoretical contributions and practical implications of the paper, as well as limitations and recommendations for future research. The final section of the paper is devoted to conclusions.

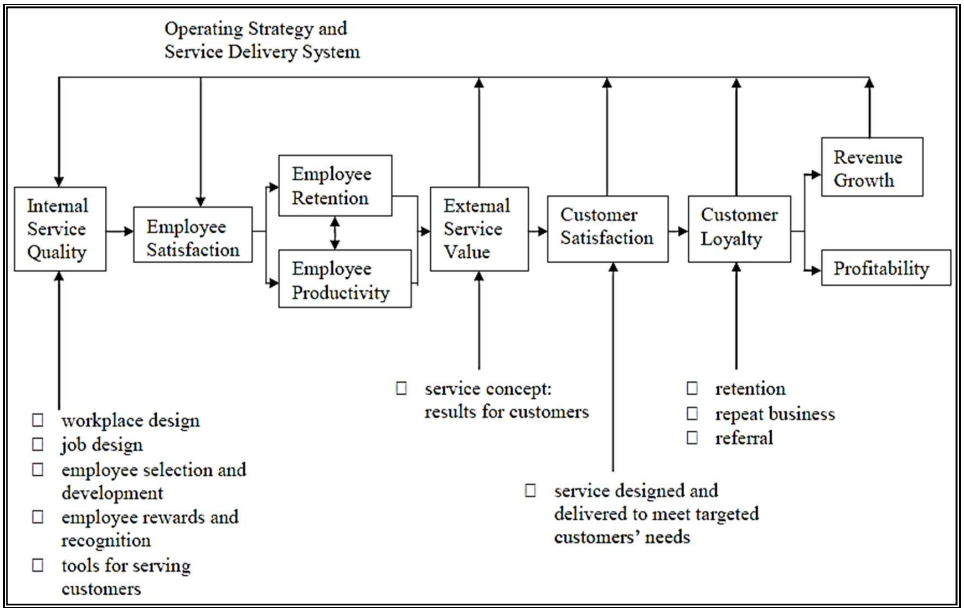

Figure 1 – The Links in the Service-Profit Chain (Heskett et al., 1994)

2 LITERATURE REVIEW AND HYPOTHESES

2.1 Impact of ISO 9001 on Employee- and Customer-Related Company Performance

ISO 9001 is widely perceived as the first step towards implementing a company-wide quality culture (Oliveira et al., 2019). Fulfilling requirements of ISO 9001 based on quality management principles enables companies to improve their QMS, with expected outcome of enhanced employee and customer satisfaction, as a necessary condition for profitability and growth. Pfau, Detzel and Geller (1991) emphasize that only a small number of employees directly serve external customers; however, almost all of employees serve their co-workers, who represent their internal customers. Internal customers need to be satisfied with the quality of services provided by their internal suppliers in order to create value for external customers. The authors assert that lagging in internal service quality produces time waste and additional costs of quality control, thus affecting a company's bottom line. They find that "The lack of close attention to internal supplier-customer relationships jeopardize external customer satisfaction. Companies must ensure that customers are satisfied-both within and outside of the firm". Similarly, Hauser, Simester and Wernerfelt (1996) state that one aspect of a company's market orientation is "to focus internal suppliers on serving their internal customer who, in turn, serves the (external) customers". McDermott and Emerson (1991) point out that employees cannot make the product or provide service of the highest standard to external customers if they are not supplied by a

quality service from their company. The authors underline that customer satisfaction should be given a strategic priority, and all employees within the company should be regarded as internal customers. Market success demands creation of internal customer service culture within a company, so each employee is aware of his customers' needs, tends to exceed those needs and expectations, and does so in a cost-effective way. Marshall, Baker and Finn (1998) notice that most Total Quality Management (TQM) initiatives emphasize internal customer service system comprised of employees as independent suppliers who perceive their co-workers as important customers. The authors further state that "at each functional interface, customer needs, reciprocal obligations, and satisfaction should be determined".

Heskett et al. (1994) demonstrate that quality of internal services and policies positively impact employee satisfaction, loyalty and productivity, contributing to value creation, making customers satisfied and loyal. Loyal customers repeat purchases and spread a positive word-of-mouth, helping a company to attract new customers. Additionally, loyal customers are less price-sensitive and buy multiple products and services from the company. The authors acknowledge that companies should employ new success measurement techniques that „calibrate the impact of employee satisfaction, loyalty, and productivity on the value of products and services delivered so that managers can build customer satisfaction and loyalty and access the corresponding impact on profitability and growth".

Impact of ISO 9001 on company performance has been studied by numerous scholars as it has been reviewed in the literature (Tarí, Molina-Azorín and Heras, 2012; Heras-Saizarbitoria and Boiral, 2013; Lushi et al., 2016; Sfreddo et al., 2021), however, the impact on employee-related company performance, as a part of its main objective, was only sporadically and partially examined. Several studies find positive impact of ISO 9001 on employee satisfaction (Valmohammadi and Kalantari, 2015; Bekele and Zewedie, 2017; Othman, 2019; Swei et al., 2019). Karapetrovic, Casadesus and Saizarbitoria (2010) point out that ISO 9001 certification leads to improved productivity, internal organisation and communication, employee motivation and defect reduction. Similarly, Melão and Guia (2015) assert that certification contributes to process improvement, job design, employee motivation and communication, while Kakouris and Sfakianaki (2018) find that ISO 9001 improves quality awareness, productivity, personnel participation and efficiency. Kokkina, Chountalas and Magoutas (2020) assert that employee engagement is one of the core principles of ISO 9001, while the key consequences of employee engagement are job satisfaction, organisational commitment and intention to quit. The authors refer to the work of Baker and Leiter (2010) stating that engagement leads to profitability through increased productivity, sales, customer satisfaction and employee retention.

In order to examine the impact of ISO 9001 on the company's performance related to employees, based on the Heskett et al.'s (1994) model, the following hypothesis is proposed:

H1: QMS certification to ISO 9001 has a positive impact on employee-related company performance.

Petnji Yaya, Marimon and Casadesus (2014) studied the relationship between ISO 9001 certification and customer-related performance of banks, such as customers' perception of service recovery, satisfaction, value and loyalty. Although these authors find no influence of ISO 9001 certification on the mentioned customer-related measures of performance, their results reveal that ISO 9001 certified banks experience about 47% stronger relationship between customer satisfaction and loyalty than their non-certified peers. Some authors find positive impact of ISO 9001 on market share (Kong, Gomez and Hamid, 2009; Valmohammadi and Kalantari, 2015) and customer satisfaction (Kong, Gomez and Hamid, 2009; Nabavi, Azizi and Faezipour, 2014; Valmohammadi and Kalantari, 2015; Husseini et al., 2018). Gotzamani (2010) concludes that ISO 9001 certification helps reduce customer complaints and increase their satisfaction, improve communication with external stakeholders, and improve company image. Prajogo, Nair and Castka (2022) find that the reputation of certification bodies directly positively affects market-oriented outcome of companies awarded with ISO 9001 certificate, while such effect is strengthened by the quality of ISO 9001 implementation. In order to analyse the impact of companies' QMS certification to ISO 9001 on customer-related company performance, based on the Heskett et al.'s (1994) model, the following hypothesis is proposed:

H2: QMS certification to ISO 9001 has a positive impact on customer-related company performance.

2.2 The Role of ISO 9001 Certification Incentives

There are various reasons for implementing ISO 9001 in organisations, such as to achieve business excellence and organisational efficiency, to improve company image, to access market or governmental funds, to follow the trend, and to respond to the expectations of stakeholders. Heras-Saizarbitoria and Boiral (2013) assert that the standard is particularly useful in international trade for eliminating obstacles arising from different national practices and reducing information-related transaction costs. This is especially important for global supply chains which need convergence of management systems, as outsourcing and relocation of activities became the key strategic options.

Two are the main theoretical perspectives that have been used in the literature to analyse the incentives to ISO 9001 certification. According to the institutional theory and neo-institutional theory perspective, organisations adopt structures and management practices according to expectations in their institutional environment in order to obtain legitimacy and ensure survival, although such

approach does not necessarily lead to efficiency (Walgenbach, 1998; Tempel and Walgenbach, 2007). As Martínez, Carabel and Del Castillo Feito (2018) assert, organisation's legitimacy and reputation are intangible assets of growing importance for the survival of organisations, and ISO 9001 positively influences these. Zhang, Jiang and Noorderhaven (2019) consider a certification as a strategic legitimacy action of foreign companies operating in a transition economy. In such an environment, where institutions are less developed and stable, certification leads to increased confidence of stakeholders, foreign company acceptance, access to valuable resources, and finally, to improved profitability. On the other side, according to the resource-based view, companies perceive ISO 9001 as a resource to be employed in building an effective QMS in order to improve operational efficiency, quality and profitability, while ISO 9001 certificate is perceived as a by-product of standards' implementation (Nair and Prajogo, 2009; Dias and Heras-Saizarbitoria, 2016).

DiMaggio and Powell (1983) explain that institutional isomorphism can take form of coercive, mimetic and normative isomorphism. With regard to ISO 9001 certification, coercive isomorphism may result as a consequence of either formal or informal pressure from the institutional environment (customers' or governmental requirements and expectations). Beck and Walgenbach (2003) find that apart from strong customer influence, obtaining ISO 9001 certificate is valuable if companies are expecting financial support from governmental agencies. Mimetic isomorphism refers to imitation of other organisations, usually competitors, in order to improve a company's image in an uncertain environment. Normative isomorphism results from the influence of professionalism, education, networks and so on. Government agencies contribute not only to coercive isomorphism, but also to the normative isomorphism through educational activities and incentive programmes promoting best practices (Heras-Saizarbitoria, Arana and San Miguel, 2010).

Presenting a historical overview of the reasons for ISO 9001 implementation, Bravi, Murmura and Santos (2019) conclude that the motivations can be classified as external and internal. External incentives are associated with a pursuit of obtaining legitimacy in the institutional environment. This means that companies certify QMS to ISO 9001 in response to market pressures, to participate in government funding, or to follow the trend and improve company image. Casadesus, Marimon and Alonso (2010) perceive that most organisations from the tourism industry are externally motivated for implementing QMS. On the other hand, internal certification incentives relate to a desire for improving quality of a company's products, services and processes, resulting also in lower costs and higher efficiency. Some questions have been raised in the literature due to standardised certificate which does not indicate the level of ISO 9001 implementation, so companies may achieve different levels of fidelity when implementing ISO 9001, from merely superficial to genuinely substantive (Chountalas, Magoutas and Zografaki, 2020). Consequently, although possessing the same certificate, some companies may achieve performance improvements,

while others may not. Several authors (Nair and Prajogo, 2009; Heras-Saizarbitoria, Boiral and Allur, 2018; Chountalas, Magoutas and Zografaki, 2020) state that the increasing number of certification bodies favours a symbolic and instrumental implementation of ISO 9001, leading to diminishing value of the certification as a differentiator. Other authors (Dias and Heras-Saizarbitoria, 2013; Nabavi, Azizi and Faezipour, 2014; Kumar, Maiti and Gunasekaran, 2018; Hernandez-Vivanco et al., 2019; Oliveira et al., 2019) argue that having only formal ISO 9001 QMS in place does not result in performance improvement, but the effective internalisation of the standard and the organisation-wide commitment to quality.

Boiral (2003, p.733) finds that, although QMS might appear coherent due to 'ceremonial aspects of certification process', in practice there are diverging opinions among personnel, what requires an adjusted implementation approach, rather than 'entirely technical, consensual and instrumental'. Moreover, the author argues that employees' different and very often critical attitudes towards ISO 9000 lead to superficial support of its adoption. Heras-Saizarbitoria and Boiral (2015) assert that engagement of external consultants diminish the role of employees in the process of standards implementation and follow-up, resulting in standards' superficial adoption. Since employees are the main lever for effective and efficient implementation of ISO 9001, their role should not be neglected. Existing research shows that internal motives for ISO 9001 certification lead to higher level of fidelity and internalisation of ISO 9001, and, consequently, produce a greater impact on business performance than external motives (Martínez-Costa, Martínez-Lorente and Choi, 2008; Nair and Prajogo, 2009; Heras-Saizarbitoria and Boiral, 2015; Valmohammadi and Kalantari, 2015; Del Castillo-Peces et al., 2018; Holmemo, Rolfsen and Ingvaldsen, 2018; Chountalas, Magoutas and Zografaki, 2020). Internal certification incentives are found to be in a positive relationship with operational performance, while that was not the case with external certification incentives (Prajogo, 2011). Zimon and Dellana (2020) find that Polish SMEs that decided to abandon ISO 9001 were rather externally than internally motivated for certification. One of the reasons for abandonment was questionable benefit in relation to the cost of certification. Given this background, the following hypotheses are suggested to test the impact of ISO 9001 on employee- and customer-related company performance with regard to certification incentives, based on the Heskett et al.'s (1994) model:

H3: Improvement in employee-related company performance after QMS certification to ISO 9001 is more significant in companies with internal certification incentives.

H4: Improvement in customer-related company performance after QMS certification to ISO 9001 is more significant in companies with internal certification incentives.

3 METHODOLOGY

3.1 Survey Design and Data Collection

The survey was conducted in the Republic of Serbia involving quality managers from 141 companies with a valid ISO 9001 certificate. According to the International Organizational for Standardization (2020) there are 3,092 valid ISO 9001 certificates in Serbia, thus the sample represents 4.6% of the population. According to the Statistical Yearbook of the Republic of Serbia (2021), the total number of companies in 2019 was 88,224, with the highest portion of micro companies (83.9%), followed by small (12.6%), medium (2.9%) and large companies (0.6%). Manufacturing companies participate with 27.1% in the total number of companies, trade companies with 34.2% and service companies with 38.7%. Given that there is no up-to-date database of certified companies, nor was it possible to obtain such information from certification bodies, the business register for each city was consulted and selected certain number of companies in proportion to the size of the city, according to the method of random sampling (for sample structure see Table 1). For each company selected in this way, the possession of valid ISO 9001 certificate was checked.

Table 1 – Sample Structure According to Industry Type and Company Size

	Frequency	**%**
Industry type		
Manufacturing	95	67.4
Trade	16	11.3
Service	30	21.3
Total	141	100
Company size		
Micro	17	12.1
Small	63	44.7
Medium	40	28.4
Large	21	14.8
Total	141	100

Data was collected using a questionnaire, which included questions related to the companies' predominant certification incentive (internal/external), and the perception of change in employee- and customer-related company performance after the ISO 9001 certification. Respondents evaluated the change of each measure of employee-related performance (employee satisfaction, employee retention, and employee productivity) and customer-related performance

(customer satisfaction, customer retention, and market share) after ISO 9001 certification on a five-point Likert scale (1 = significantly low, 5 = significantly high), and declared whether their primary motivation for certification was internal or external. Out of 228 sent questionnaires, 145 were returned, giving the response rate of 64%. There were 4 incomplete questionnaires which were excluded from the study, leading to the final sample size of 141.

3.2 Variables

The research was designed based on the Heskett et al.'s (1994) framework. To measure employee-related company performance three variables were used: employee satisfaction, employee retention and employee productivity. For measuring customer-related performance, the Heskett et al.'s (1994) model was adjusted to include the following variables: customer satisfaction, customer retention (as a reflection of customer loyalty) and companies' market share (as a result of repeated purchase of satisfied customers and purchase of new customers as a result of referral). Table 2 presents the correlation matrix (R-matrix) for employee- and customer-related performance measures. There are high intercorrelations among all three customer-related performance measures, suggesting that these variables could be measuring aspects of the same underlying dimension. When it comes to employee-related performance measures, intercorrelations among them are still significant, but lower than in case of customer-related performance measures.

In order to analyse whether the six aforementioned variables correctly measure the improvement in employee- and customer-related performance, principal component analysis (PCA) was conducted. The Kaiser-Meyer-Olkin measure, KMO = 0.785 verified good sampling adequacy and the Bartlett's Test of Sphericity, $\chi 2(15) = 349.01$, $p < 0.001$, indicated that correlations between variables were sufficiently large for PCA.

Table 3 shows the factor loadings after orthogonal rotation (varimax). In this study and according to Field (2009), the cut-off point for factor loadings was set to 0.4. Kaiser's criterion for factor extraction was used and two factors with eigenvalues greater than 1 were extracted. Variables such as customer satisfaction, customer retention rate and companies' market share load highly on factor customer-related performance and variables such as employee satisfaction, employee retention rate and employee productivity load highly on factor employee-related performance. It should be noted that employee satisfaction and employee productivity load on factor customer-related performance as well, but factor loadings for this factor are significantly lower than that for factor employee-related performance. Based on these results, it can be concluded that employee satisfaction, employee retention and employee productivity are good measures of employee-related company performance, and customer satisfaction, customer retention and companies' market share are appropriate measures of customer-related company performance. In addition, Cronbach's alphas for both

employee- and customer-related company performance measures are high, indicating good reliability of the measuring instruments. The third variable used in the study is certification incentives (internal vs. external).

Table 2 – Pearson Correlation Coefficients for the Employee- and Customer-Related Performance Measures

	Employee productivity	Employee satisfaction	Employee retention	Market share	Customer satisfaction	Customer retention
Employee productivity	1.000					
Employee satisfaction	0.715	1.000				
Employee retention	0.250	0.318	1.000			
Market share	0.457	0.375	0.144	1.000		
Customer satisfaction	0.543	0.455	0.184	0.660	1.000	
Customer retention	0.462	0.446	0.153	0.629	0.745	1.000

The study uses frequencies, arithmetic means, and standard deviations as descriptive statistics. The hypotheses are tested using the inferential statistical techniques ANOVA and T-test, and multiple regression analysis. The probability level is set at 0.05. SPSS v 21 and STATA v 13 are used for data analysis.

Table 3 – Summary of Explanatory Factor Analysis Results for the Employee- and Customer-Related Performance Measures

Item	**Rotated Factor Loadings**	
	Customer-related performance	Employee-related performance
Customer satisfaction	0.871	
Customer retention	0.864	
Market share	0.834	
Employee retention		0.822
Employee satisfaction	0.448	0.714
Employee productivity	0.555	0.615
Eigenvalues	2.715	1.632
% of variance	45.244	27.196
Cronbach's Alpha	0.861	0.636

4 FINDINGS

Table 4 presents the descriptive statistics of the measured parameters. Most respondents agree that ISO 9001 improve customer satisfaction (87%, while 13% perceive no change), customer retention (82%, 18% perceive no change), market share (80%, 20% perceive no change), and employee productivity (73%, 27% perceive no change). More than a half of respondents perceive improvement in employee satisfaction (56%, 43% perceive no change, and 1% perceive that the certification negatively affected employee satisfaction). Regarding employee retention, most respondents perceive no change (51%, 40% perceive that certification has contributed to increasing employee retention, and 9% perceive that certification even decreased employee retention). The results only partially support H1, as two out of three employee-related performance measures were improved after ISO 9001 certification. On the other hand, the obtained results show improvement in all customer-related performance measures, therefore H2 is confirmed.

The ANOVA determines whether there is a statistically significant difference between companies of different sizes (micro, small, medium and large) in terms of tested variables (see Table 5). There is a statistically significant difference in company size for market share ($F = 2.835$, $p = 0.041$) and customer retention ($F = 3.26$, $p = 0.024$). Improvement in market share after certification to ISO 9001 is the highest among small companies ($M = 4.13$), while the improvement in customer retention is the highest among medium companies ($M = 4.30$).

Table 4 – Descriptive Statistics for the Measured Parameters

Item	**N=141**
Perceptual improvement after QMS certification to ISO 9001	M ± SD (Min-Max)
Employee productivity change after QMS certification to ISO 9001	3.91±0.66 (3.00-5.00)
Employee satisfaction change after QMS certification to ISO 9001	3.65±0.72 (1.00-5.00)
Employee retention change after QMS certification to ISO 9001	3.48± 0.99 (1.00-5.00)
Market share change after QMS certification to ISO 9001	4.00± 0.67 (2.00-5.00)
Customer satisfaction change after QMS certification to ISO 9001	4.18±0.64 (3.00-5.00)
Customer retention change after QMS certification to ISO 9001	4.14±0.69 (3.00-5.00)
Incentives for QMS certification to ISO 9001	n(%)
Improvement in customer-related company performance	0.00±1.00 (-1.82-2.28)
Improvement in employee-related company performance	0.00±1.00 (-1.90-2.39)
External	24 (17.6%)
Internal	108 (79.4%)
Both external and internal	4 (3.0%)

The ANOVA test also checks for a statistically significant difference between companies belonging to different types of industries (manufacturing, trade, services) in terms of improvement of tested variables after QMS certification to ISO 9001 (see Table 6). There is a stronger significant improvement in employee retention (F = 5,246, p = 0.006) after certification in trade companies compared to manufacturing and service companies (M = 4.19 vs. M = 3.35; and M = 3.53).

Table 5 – Improvement in Employee- and Customer-Related Company Performance after QMS Certification to ISO 9001 by Company Size

	Company size											
	Micro		Small		Medium		Large		Total		F	p
	M	SD	M	SD	M	SD	M	SD	M	SD		
Employee productivity	3.59	0.51	3.97	0.70	4.05	0.74	3.74	0.45	3.91	0.67	2.504	0.062
Employee satisfaction	3.59	0.62	3.61	0.82	3.81	0.74	3.53	0.51	3.65	0.74	0.856	0.466
Employee retention	3.88	0.99	3.57	0.96	3.30	1.05	3.21	0.85	3.49	0.99	2.069	0.107
Market share	3.81	0.66	4.13	0.65	4.08	0.72	3.68	0.58	4.02	0.68	2.835	0.041
Customer satisfaction	4.00	0.73	4.28	0.64	4.27	0.65	3.95	0.62	4.20	0.66	1.901	0.133
Customer retention	4.00	0.73	4.20	0.71	4.30	0.66	3.74	0.56	4.14	0.70	3.269	0.024

Notes: M – arithmetic mean; SD – standard deviation; F– ANOVA test; p – statistical significance.

Multiple regression analysis is used to test whether there are significant differences in the improvement of overall customer- and employee-related performance after QMS certification to ISO 9001 among companies of different sizes and industries (see Table 7). The assumption of homoscedasticity is tested using the Breusch-Pagan and Cook-Weisberg test for heteroscedasticity. In both models, the test was not statistically significant ($\chi2(1) = 0.38$, $p = 0.537$; $\chi2(1) = 0.11$, $p = 0.745$), indicating that the assumptions for using the Ordinary least squares (OLS) model are met.

In the first regression model, the dependent variable is factor Improvement in customer-related company performance, while in the second one the dependent variable is factor Improvement in employee-related company performance. In both regression models, independent variables are dummy variables that represent different company sizes and different industries. Small companies and manufacturing companies are chosen as base groups since most companies in the sample are small companies, and the most common industry type is manufacturing. Even if some beta coefficients are statistically significant, both regression models are not significant (F = 2.21, p = 0.057; F = 2,03 p = 0.079), suggesting that there are no significant differences in the improvement of the

overall customer- and employee-related company performances among different company sizes and companies belonging to different industries.

Table 6 – Improvement in Employee- and Customer-Related Company Performance after QMS Certification to ISO 9001 by Industry Type

	Industry type									
	Manufacturing		Trade		Service		Total		F	p
	M	SD	M	SD	M	SD	M	SD		
Employee productivity	3.91	0.65	4.13	0.62	3.80	0.71	3.91	0.66	1.252	0.289
Employee satisfaction	3.60	0.74	4.00	0.73	3.67	0.66	3.66	0.73	2.104	0.126
Employee retention	3.35	0.92	4.19	0.98	3.53	1.07	3.49	0.99	5.246	0.006
Market share	4.01	0.64	4.06	0.77	3.96	0.74	4.01	0.67	0.111	0.895
Customer satisfaction	4.20	0.58	4.25	0.68	4.14	0.83	4.19	0.65	0.164	0.849
Customer retention	4.12	0.68	4.38	0.62	4.11	0.80	4.15	0.70	0.963	0.384

Notes: M – arithmetic mean; SD – standard deviation; F– ANOVA test; p – statistical significance.

Table 7 – Improvement in Overall Employee- and Customer-Related Company Performance after QMS Certification to ISO 9001 by Company Size and Industry Type

Company performance	**Customer-related**		**Employee-related**	
	Coef.	p	Coef.	p
Micro	-0.574	0.041	0.105	0.706
Medium	0.063	0.767	0.013	0.952
Large	-0.659	0.015	-0.088	0.742
Trade	-0.024	0.931	0.818	0.003
Services	-0.097	0.677	0.102	0.661
Constant	0.178	0.251	-0.139	0.369
F	2.21		2.03	
Prob > F	0.057		0.079	
R-squared	0.082		0.076	
Number of observations	130		130	

To test whether the effect of company size on the customer- and employee-related performance has an inverted U-shaped effect, a multiple regression model in the form of a quadratic function is specified (see Table 8). The independent variables are company size and company size squared. The variable company size takes value from one to four depending on whether a company is micro, small, medium, or large. The dependent variable in the first model is factor Improvement in customer-related company performance, while in the second one it is factor Improvement in employee-related company performance. In the first model, all estimated parameters are statistically significant. Since the estimated parameter of company size is positive ($p = 0.002$) and of company size squared is negative ($p = 0.001$), the effect of company size on the customer-related performance has an inverted U-shaped effect. Specifically, a micro-sized company that grows into a small company achieves significant improvements in overall customer-related performance after certification. However, as a company continues to grow into a medium-sized company, customer-related performance after certification starts to decrease. This trend continues as a company keeps growing to a large company. In the second model, the estimated parameters, and the whole model ($F = 0.49$; $p = 0.617$) are not statistically significant, indicating that the company size does not influence employee-related performance. The assumption of homoscedasticity is tested using the Breusch-Pagan and Cook-Weisberg test for heteroscedasticity. In both models, the test was not statistically significant ($\chi2(1) = 0.55$, $p = 0.458$; $\chi2(1) = 1.81$, $p = 0.179$), indicating that the assumptions for using the Ordinary least squares (OLS) model are met.

Table 8 – The Effect of Company Size on Overall Employee- and Customer-Related Company Performance

Company performance	**Customer-related**		**Employee-related**	
	Coef.	p	Coef.	p
Company size	1.598	0.002	-0.103	0.844
Company size squared	-0.319	0.001	0.001	0.993
Constant	-1.741	0.005	0.231	0.716
F	5.47		0.49	
Prob > F	0.005		0.617	
R-squared	0.079		0.008	
No. of observations	130		130	

The impact of certification incentives on improvement of tested variables after certification is assessed using T-tests (see Table 9). The results indicate that, after certification, companies with internal certification incentives achieve more significant improvements in employee productivity ($t = -3.232$, $p = 0.002$), employee satisfaction ($t = -3.567$, $p = 0.001$), market share ($t= -3.376$,

p = 0.001), customer satisfaction (t= -3.814, p = 0.000) and customer retention (t = -3.537, p = 0.001) than companies with external certification incentives. However, there is no evidence that certification incentives impact the improvement in employee retention after certification (t = -1.504, p = 0.135). Therefore, H3 is partially confirmed, and H4 is confirmed.

Multiple regression analysis tests whether there are significant differences in improving the overall customer- and employee-related company performance after certification between companies with internal and external certification incentives (see Table 10). Certification incentives is the primary independent variable, equal to one, if a company is internally motivated or zero, if it is externally motivated. Other independent variables are also dummy variables that control company size and industry type. Factor Improvement in customer-related company performance is the dependent variable in the first model, while in the second one it is factor Improvement in employee-related company performance.

Table 9 – Difference in Employee- and Customer-Related Company Performance Improvement between Companies Driven by Internal and External Certification Incentives

Certification incentives						
	External		Internal		t	p
	M	SD	M	SD		
Employee productivity	3.54	0.51	4.01	0.67	-3.232	0.002
Employee satisfaction	3.25	0.61	3.79	0.69	-3.567	0.001
Employee retention	3.25	0.90	3.58	1.00	-1.504	0.135
Market share	3.61	0.72	4.10	0.62	-3.376	0.001
Customer satisfaction	3.79	0.72	4.31	0.58	-3.814	0.000
Customer retention	3.74	0.62	4.27	0.66	-3.537	0.001

Notes: M – arithmetic mean; SD – standard deviation; t-test.

Breusch-Pagan and Cook-Weisberg test for heteroscedasticity is used for testing the assumption of homoscedasticity. In the first model, the test for heteroscedasticity was not statistically significant ($\chi2(1) = 1.04$, p = 0.309), indicating that the assumptions for using the OLS model are met. In the second model, this test was statistically significant ($\chi2(1) = 3.93$, p= 0.047), so the OLS model with heteroscedasticity robust standard errors is used. In both models, the estimated parameter of certification incentives is positive and statistically significant ($p < 0.004$), indicating that companies with internal certification incentives achieve more significant improvements in overall customer- and employee-related performance after certification compared to companies with external certification incentives.

Table 10 – Difference in Overall Employee- and Customer-Related Company Performance Improvement between Companies Driven by Internal and External Certification Incentives by Company Size and Industry Type

Company performance	**Customer-related**		**Employee-related**	
	Coef.	p	Coef.	p
Certification incentives	0.857	0.000	0.555	0.004
Micro	-0.503	0.061	0.122	0.643
Medium	-0.076	0.708	-0.046	0.834
Large	-0.775	0.003	-0.204	0.457
Trade	-0.039	0.879	0.760	0.014
Services	0.127	0.575	0.101	0.701
Constant	-0.483	0.045	-0.516	0.016
F	4.53		3.40	
Prob > F	0.000		0.004	
R-squared	0.191		0.116	
No. of observations	122		122	

5 DISCUSSION AND CONCLUSIONS

The current study attempts to fill the existing literature gap by focusing on the achievement of the ISO 9001's main objective in certified companies, which is to meet customer requirements and exceed customer expectations, where customers are defined as internal (employees) and external (final users of a company's outputs). Specifically, the study examines the impact of ISO 9001 on company performance related to its employees and customers. Since the previous research suggest that ISO 9001 may be only formally implemented for mandatory reasons or marketing purposes, what does not necessarily lead to fulfilment of ISO 9001 objective, this study includes certification incentives to observe their impact on the change in company performance related to customers and employees after certification. As the sample was not limited to companies of a specific size, sector or industry type, control variables, such as industry type and company size, are employed to derive insights into the impact of these characteristics on motives for, and effects of, certification.

The results of the study reveal that ISO 9001 certification positively impacts customer satisfaction, customer retention, market share, employee productivity and employee satisfaction (similar results were reached by Gotzamani, 2010; Karapetrovic, Casadesus and Saizarbitoria, 2010; Nabavi, Azizi and Faezipour, 2014; Melão and Guia, 2015; Valmohammadi and Kalantari, 2015; -bekele and

Zewedie, 2017; Husseini et al., 2018; Kakouris and Sfakianaki, 2018; Othman, 2019; Sweis et al., 2019), but there is no evidence of its impact on employee retention. Some of the authors finding positive impact of ISO 9001 on employee satisfaction (Rodríguez-Antón and Alonso-Almeida, 2011; Sakka, 2013; Bekele and Zewedie, 2017; Neyestani and Juanzon, 2017; Sweiss et al., 2019) explain that such effect comes from improved education, communication, empowerment, team work, clear quality goals, continuous improvement and improved working conditions, especially regarding safety and health at work. Positive impact of certification on customer-related company performance supports the assumption that ISO 9001 certificate helps companies to obtain legitimacy in their institutional environment, improve image and overcome trade barriers.

While it was found that ISO 9001 improves customer-related company performance, the positive impact on employee-related company performance is rather weak. As expected, compared to companies with external certification incentives, companies driven by internal incentives achieve greater benefits from certification (similarly to findings of Martínez-Costa, Martínez-Lorente and Choi, 2008; Nair and Prajogo, 2009; Prajogo, 2011; Valmohammadi and Kalantari, 2015; Holmemo, Rolfsen and Ingvaldsen, 2018; Chountalas, Magoutas and Zografaki, 2020) except in case of employee retention. The most significant improvement in market share after certification is observed in small companies, possibly because ISO 9001 certificate was beneficial for increasing legitimacy of these companies. Further, trade companies realise a more significant improvement in employee retention compared to manufacturing and service companies. The highest increase in employee retention of trade companies after ISO 9001 certification could be the consequence of potentially the highest employee fluctuation rate of trade companies prior to certification compared to manufacturing and service companies.

The current study makes significant practical contributions by explaining the link between ISO 9001 certification and company performance concerning employees and customers. The results provide evidence of value of ISO 9001 under certain conditions, and the positive impact is stronger when companies are internally motivated to obtain ISO 9001 certification. Although visibility and legitimacy achieved through ISO 9001 help improve performance, if companies are committed to standards and use them in daily activities as a resource to strengthen organisational capability, they may expect superior benefits. Small companies could expect the highest increase in market share after certification, while customer retention is likely to be the most improved in companies of medium size. Employee retention is likely to be most increased in trade companies.

6 LIMITATIONS

There are few limitations of this study. The first one refers to geographic reach of the study, limiting the generalisability of the results. The second limitation could

be the objectivity and knowledge of quality managers regarding employee- and customer-related company performance. Although it is assumed that quality managers are familiar with performance measures in question, in practice it could be different. Further, quality managers are specialist responsible for successful standard implementation, so it can be expected that their responses are influenced by social desirability bias (Heras-Saizarbitoria and Boiral, 2013; Boiral at al., 2018).

It is suggested for future research to investigate the perception of employees and their supervisors, customers, marketing and sale managers in order to improve data reliability. Future research could also investigate the level and fidelity of ISO 9001 implementation, and the impact of contingency factors on the effectiveness of ISO 9001 implementation, such as the company maturity, environmental pressures for certification, management and employee knowledge of ISO 9001, readiness to change and commitment to the standard's effective implementation, the behaviour of external consultants and certification bodies, culture and so on. Finally, the current analysis shows that 1% of companies experienced negative impact of ISO 9001 on employee satisfaction and even 9% of companies perceive that ISO 9001 reduces employee retention. Such negative experiences with ISO 9001 may be the consequence of additional workload, increased degree of formalisation, or reduced flexibility of organisations, as Beck and Walgenbach (2009) argue. Therefore, future studies may be directed towards examining this problem further.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.