



# A survey on ISO 9001 decertified companies: The three stages leading to withdrawal

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## Abstract

This study investigates the three main stages of the ISO 9001 certification process (implementation, maintenance, and withdrawal) from the perspective of decertified firms. The research employs a descriptive and inductive survey methodology, drawing insights from a literature review and the analysis of primary data obtained from a sample of decertified organisations. Results suggest that the decertification is triggered during the pre-certification stage, where these firms overemphasise external motivations to the detriment of internal ones. Additionally, this study finds that, in the maintenance stage, these firms are unable to commit to continuous improvement. The interplay of external motivations, the lack of internalisation and continuous improvement, and the nature of benefits gained by these entities ultimately leads to certification withdrawal. Furthermore, the paper highlights that the consequences of decertification vary: most firms report no negative impact on their performance, but some report a negative impact, which seems to result from even stronger external motivations. This is the first descriptive (and inductive) study to address decertification from the dual perspective of the whole certification process and of the decertified firms, adding to the scarce research on decertification by providing a comprehensive overview of this phenomenon and identifying a holistic explanation for the withdrawal.

**Keywords:** benefits, continuous improvement, decertification, ISO 9001, maintenance, motivations, obstacles, performance.

## 1. Introduction

ISO 9001 stands out as the most widely embraced standard for certifying quality management systems (QMS; Wiengarten et al., 2017). Firms are drawn to ISO 9001 certification due to its potential to enhance internal operations in terms of quality and efficiency, as well as its ability to bolster external perceptions, thereby positively impacting market image and market share (Boiral & Roy, 2007; Lo & Chang, 2007; Martínez-Costa et al., 2008; Sampaio et al., 2012;

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Djofack & Camacho, 2017; Siltori et al., 2021). These advantages often translate into a competitive edge (e.g., Conti, 2004; Casadesús & Karapetrovic, 2005), which significantly influences financial performance (e.g., Tzelepis et al., 2006; Chatzoglou et al., 2015).

The existing body of research on ISO 9001 has predominantly focused on its performance impact and the benefits associated with certification (e.g., Hernandez-Vivanco et al., 2019; Ullah, 2020; Siougle et al., 2024), with the majority of studies indicating a positive effect (e.g., Hernandez-Vivanco et al., 2019; Sfreddo et al., 2021; Siougle et al., 2019, 2024). Additionally, research has explored various related topics, including the implementation process of ISO 9001 (e.g., Esgarrancho and Cândido, 2020), motivations and barriers to certification (e.g., Djofack & Camacho, 2017; Carvalho and Medeiro, 2022), internalisation of the standard versus decoupling (e.g., Cai and Jun, 2018; Georgiev and Georgiev, 2024), and the stages of the certification process (e.g., Castka, 2018; Cândido, 2024). Other research topics also include the maintenance of the ISO 9001 QMS (e.g., Ong et al., 2015), innovation within certified firms (e.g., Terziovski and Guerrero, 2014; Bravo et al., 2017), the revision of the ISO 9001 standard (e.g., Fonseca et al., 2023), and the regional and worldwide diffusion of the standard (e.g., Rodriguez-Arnaldo and Martínez-Lorente, 2021).

However, recent years have witnessed a notable trend of firms withdrawing from ISO 9001 certification (Cândido et al., 2021). On average, according to the latest available data, 60,132 firms decertify annually, which corresponds approximately to 18% of the firms that should annually renew their certificates (ISO, 2015a; Ferreira & Cândido, 2021). The extension of this worldwide phenomenon of decertification has prompted a burgeoning interest in research, albeit still nascent (Camango and Cândido, 2023). This emerging body of literature primarily delves into two key areas: the motivations driving decertification among both certified and decertified firms (e.g., Chiarini, 2019; Clougherty and Grajek, 2023), and the subsequent consequences anticipated by certified firms or experienced by those already decertified (Alic, 2014; Kafel and Simon, 2017; Cândido and Ferreira, 2022).

This research has primarily approached this issue from the perspective of firms that might become decertified, paying less attention to those already decertified. Furthermore, research from the latter perspective has mainly addressed motivations for decertification (Alič, 2014; Kafel & Nowicki, 2014; Cândido et al., 2016; Simon & Kafel, 2018; Chiarini, 2019), while overlooking other factors pertinent to certification and maintenance phases (e.g., certification obstacles, certification benefits, and maintenance problems), which can be crucial for better understanding decertification. Thus, despite the growing interest, there remains a dearth of research elucidating why ISO 9001 withdrawal affects many firms. Understanding why and how firms decertify is vital for both organisational managers and certification authorities, as it can inform strategies to mitigate the likelihood of withdrawal.

Therefore, this study seeks to fill this research gap by delving into the topic of decertification from the perspective of decertified firms. It begins by reviewing the limited existing literature on decertification from the standpoint of these firms, encompassing only six studies (Alič, 2014; Kafel & Nowicki, 2014; Cândido et al., 2016; Simon & Kafel, 2018; Chiarini, 2019; Hernandez-Vivanco & Bernardo, 2023). Subsequently, it investigates novel research questions across the three stages of the certification process: pre-certification (i.e., preparation and implementation), post-certification (i.e., maintenance), and decertification. Specifically, this study focuses on identifying the motivations and barriers perceived in the pre-certification stage by subsequently decertified firms, understanding the certification benefits, weaknesses, and maintenance problems during the post-certification period, and analysing the reasons and consequences of the ISO 9001 withdrawal.

No previous studies have examined the problem of decertification from this comprehensive perspective: (1) investigating decertification throughout the entire certification process and (2) exploring the decertification phenomenon from the viewpoint of companies



that have already undergone decertification. Thus, the study aims to (1) identify and (2) correlate the prominent aspects of the phenomenon at each stage (motivations, benefits, problems, among others).

Employing a descriptive and inductive survey methodology, this study gathers data from a sample of Portuguese decertified firms. Portugal serves as an intriguing context for this research due to its significant number of ISO 9001 certified organizations (ISO, 2023) and the prevalence of the decertification phenomenon in recent years, according to the latest available data (ISO, 2015a).

## 2. Literature review and research questions

### 2.1. The pre-certification period

*ISO 9001 certification motivations.* ISO 9001 certification is applicable to organizations, both public and private, regardless of their size or industry (ISO, 2015b). These organizations anticipate that the certification of their Quality Management Systems (QMS) will yield value (ISO, 2012). To attain certification, their quality systems undergo auditing by an external, independent agency to ensure compliance with all requirements (Castka et al., 2015). Motivations prompting firms to seek QMS certification typically fall into internal and external categories (Kakouris & Sfakianaki, 2018). Internal motivations primarily concern organizational matters, process enhancement, streamlining, productivity, product quality, cost reduction, economic and financial performance, and competitiveness. External motivations revolve around client pressure, market signalling, corporate image, legitimacy, market share, relative advantages over non-certified competitors, and recognition of the ability to deliver quality products (Boiral & Roy, 2007; Martínez-Costa et al., 2008; Nair & Prajogo, 2009; Prajogo, 2011; Sampaio et al., 2012; Ismyrlis & Moschidis, 2015; Djofack & Camacho, 2017; Cai & Jun, 2018; Yang & Kang, 2020). Firms driven by external motives typically reap external benefits, while those with internal motivations generally experience internal benefits (Martínez-Costa et al., 2008; Sampaio et al., 2012; Djofack & Camacho, 2017). Moreover, internally motivated firms tend to perceive certification benefits more positively (Boiral & Roy, 2007; Martínez-Costa et al., 2008; Prajogo, 2011). However, existing literature only explores the motivations of certified organizations. In contrast, the certification motivations of organizations that subsequently decertify remain unexplored (Table 1). This study addresses this gap based on previous literature findings on decertification. Cândido et al. (2021) suggest that certification withdrawal might be influenced by the type of firm's initial motivations for obtaining ISO 9001 certification. Ferreira and Cândido (2021) establish a correlation between the initial certification motivations and the propensity of certified firms to decertify. Thus, the lack of research on the certification motivations of firms that subsequently decertify, coupled with indications that these motivations may differ from those of other firms, justifies the first research question:

**RQ1:** What motivates firms to pursue ISO 9001 certification prior to subsequent decertification?

*ISO 9001 certification barriers.* ISO 9001 certification is a challenging process, demanding meticulous attention to customer requirements, regulatory compliance, product quality, resource management, personnel commitment, supplier relationships, and rigorous internal auditing to effectively internalise the standard (Boiral & Roy, 2007; ISO, 2015b; Carvalho & Medeiros, 2022). Internalization denotes the firm's commitment to and adoption of ISO 9001 principles in day-to-day operations (Tari et al., 2020). Achieving this necessitates staff training, process documentation, continuous process improvement, and both internal and external audits (Cai and Jun, 2018; Tari et al., 2020). Consequently, it is not unexpected for



firms to harbor apprehensions about embarking on a formal, demanding, and prolonged ISO certification journey entailing substantial costs that might outweigh perceived benefits (Cai & Jun, 2018). This concern is particularly pronounced in small and medium-sized enterprises (SMEs), which often lack the financial and personnel resources of larger corporations (Gerolamo et al., 2014). Indeed, evidence suggests that SMEs encounter heightened obstacles in obtaining certification (Aggelogiannopoulos et al., 2007). Existing research identifies numerous barriers to successful ISO 9001 certification, categorized as internal and external, i.e., within or beyond managerial control (Ferreira & Cândido, 2021). These barriers encompass certification expenses, staff qualifications, time constraints, quality policies, managerial commitment, lofty expectations associated with ISO 9001, availability of alternative certifications, and industry-specific requisites (Aggelogiannopoulos et al., 2007; Zeng et al., 2007; Soares, 2014; Parra-López et al., 2015; Sfakianaki & Kakouris, 2020). Importantly, all existing evidence on this subject originates from certified organizations or those in the certification process. To date, no study has investigated the certification hurdles encountered by organizations that later decertify (Table 1), a crucial inquiry for comprehending the reasons behind their withdrawal from ISO 9001 certification (Ferreira & Cândido, 2021). Hence, the second research question of this paper is as follows:

**RQ2:** What are the barriers perceived by decertified firms during the period preceding their ISO 9001 certification?

## ***2.2. The post-certification period***

*ISO 9001 certification benefits.* Firms obtaining ISO 9001 certification anticipate a broad spectrum of benefits. These encompass reductions in errors, deficiencies, rework, waste, and associated inefficiencies (Lo & Chang, 2007; Yang & Kang, 2020; Sfreddo et al., 2021). Additionally, notable benefits include enhancements in product quality, production processes, punctual delivery, client satisfaction, customer trust and loyalty, employee contentment, internal communication, marketing outreach, external image, legitimacy, and expansion into new markets (Corbett et al., 2005; Lo & Chang, 2007; Lee et al., 2012; Wu & Jang, 2014; Ismyrlis & Moschidis, 2015; Kakouris & Sfakianaki, 2018; Gonçalves et al., 2020; Sfreddo et al., 2021; Maletič et al., 2022). Overall, ISO 9001 certification instills best practices that elevate productivity and quality, thereby contributing to cost savings and increased revenues and profit margins (Lo & Chang, 2007; Sivaram et al., 2013; Sfreddo et al., 2021). Indeed, most studies observe a positive and significant impact of certification on firms' financial performance (e.g., Psomas et al., 2013; Fatima, 2014; Psomas & Kafetzopoulos, 2014; Chatzoglou et al., 2015; Islam et al., 2016), which can endure for several years post-certification (Corbett et al., 2005; Aba et al., 2016; Hernandez-Vivanco et al., 2019; Siougle et al., 2019; Liu et al., 2021; Siougle & Dimelis, 2021). Importantly, evidence suggests that firms with internal motivations derive greater benefits from ISO 9001 certification compared to those with external motivations (Boiral & Roy, 2007; Sampaio et al., 2011; Sivaram et al., 2013; Kusumah & Fabianto, 2018; Maletič et al., 2022). However, existing literature primarily discusses the benefits of ISO 9001 certification solely for certified organizations. To date, research has yet to uncover the perceived benefits by organizations that ultimately decertify from this standard (Table 1). This prompts the third research question of this paper:

**RQ3:** What are the benefits of ISO 9001 registration for firms that later lose their certification?

*ISO 9001 certification weaknesses.* Several studies suggest that ISO 9001 certification does not significantly impact performance (Terziovski et al., 1997; Lima et al., 2000; Lindlbauer et al., 2016; Galetto et al., 2017), labour productivity (Albulescu et al., 2016), innovation (Bravo et al., 2017), market value (Martínez-Costa & Martínez-Lorente, 2003; Lo & Yeung, 2018), and external image (Vilkas & Vaitkevicius, 2013). There are several potential



explanations for these findings. For example, certification is often viewed as an automatic upgrade for firms merely by holding and displaying the certificate (Bangert, 2012; Ullah, 2020), which is not the case. ISO 9001 certification also presents other weaknesses, such as insufficient motivation for management and staff to fully comprehend its internal significance and comply with its requirements (Saizarbitoria et al., 2015; Sfakianaki & Kakouris, 2020), excessive levels of bureaucracy and paperwork (Terziovski et al., 2003; Sivaram et al., 2013; Chiarini & Brunetti, 2019), the non-industry-specific nature of the standard (Sivaram et al., 2013; Lindlbauer et al., 2016), diminishing external benefits in the medium term (Lo & Chang, 2007; Soares, 2014), and the possibility for competitors to also obtain certification (Su et al., 2015). Moreover, evidence suggests that ISO 9001 certification can negatively impact profitability (Martínez-Costa & Martínez-Lorente, 2007; Sampaio et al., 2011). In such cases, the costs firms incur to obtain certification (Corbett et al., 2005; Martínez-Costa & Martínez-Lorente, 2007; Sivaram et al., 2013; Glogovac & Filipovic, 2018) may not be offset by the certification's benefits (Cai & Jun, 2018). Kafel and Nowicki (2014) identify bureaucracy, frequency of internal audits, and the cost of certification maintenance as significant weaknesses in the ISO 9001 certification process from the perspective of decertified companies. This study is the only examination of this issue from such a viewpoint (Refer to Table 1). Given the scarcity of similar studies and the unique perspective of decertified firms in identifying certification weaknesses, this paper's fourth research question is as follows:

**RQ4:** What are the weaknesses of ISO 9001 certification identified by decertified firms?

*ISO 9001 certification maintenance problems.* Effectively maintaining an ISO 9001 certification presents a significant challenge, as it necessitates substantial changes in the attitudes and behaviours of both management and staff (Wahid & Corner, 2009; Ong et al., 2015; Pekovic, 2015). Key success factors in this context include top management commitment and support, staff engagement, training and education, comprehension of the standard, teamwork, continuous improvement, performance measurement, reward systems, and communication (Chin et al., 2000; Wahid & Corner, 2009; Wahid et al., 2011; Ong et al., 2015; Basir & Davies, 2018). Firms that fail to master these factors struggle to fully internalize the standard and encounter difficulties in sustaining their certification. Importantly, as highlighted by Wahid and Corner (2009), most challenges in this realm are internal and pertain to human resources, encompassing staff resistance to participate, reluctance to adhere to procedures, inadequate staff training, limited understanding of the standard, lack of commitment and communication, and deficiencies in continuous improvement efforts. Intriguingly, prior research has not explored the issues surrounding certification maintenance as perceived by decertified firms. Thus, this paper raises the following research question:

**RQ5:** What are the problems related to certification maintenance experienced by decertified firms?

### **2.3. The decertification period**

*ISO 9001 decertification motivations.* Decertification refers to the withdrawal or revocation of the ISO 9001 certificate following a period of valid registration with a certification body. Certification withdrawal may stem from a firm's independent decision, regardless of compliance with the standard, or from the certification body's decision due to the firm's non-compliance with the standard (Alič, 2014; Cândido, 2024). The number of decertified firms has been steadily increasing over the years (Cândido et al., 2016), with evidence suggesting that in some countries, the rate of withdrawals has outpaced the issuance of new certificates (Alič, 2014; ISO, 2015a). Firms may decertify due to internal or external motivations (Simon & Kafel, 2018). Internal motivations encompass factors such as the cost and time required for certification maintenance and renewal (Lo and Chang, 2007), financial distress (Simon and Kafel, 2018), certification outcomes falling short of expectations (Cândido et al., 2021),



insufficient internalization of the standard (Sansalvador & Brotons, 2015), excessive bureaucratic processes (Lo & Chang, 2007), among others. External motivations, on the other hand, include adverse external shocks, widespread certification within the firm's industry, lack of client interest in certification, and certification expiration or cancellation by the certification body (Lo & Chang, 2007; Alič, 2014; Kafel & Nowicki, 2014; Sansalvador & Brotons, 2015; Cândido et al., 2016; Chiarini, 2019; Cândido et al., 2021). Despite the significance of this topic, there is no consensus in the literature regarding the primary motivations for decertification. For instance, Alič (2014) posits that inadequate standard implementation is the primary driver, whereas Kafel and Nowicki (2014) contend that recertification costs are the main factor. Conversely, Cândido et al. (2016) emphasize that decertifying firms may have already internalized the standard. Simon and Kafel (2018) suggests that financial distress may lead to decertification, while Chiarini (2019) concludes that it mainly results from the lack of interest in certification by the firm's customers. Given the significance of this issue and the lack of consensus, this paper's sixth research question is defined as follows:

**RQ6:** What are the factors contributing to ISO 9001 decertification?

*ISO 9001 decertification consequences.* The final research question seeks to elucidate the consequences of ISO 9001 decertification. This is a significant area of inquiry as it sheds light on the outcomes of decertification, which remains relatively underexplored in the literature (Camango & Cândido, 2023). Limited research indicates that decertified firms often demonstrate diminished financial performance, with some even facing bankruptcy post-decertification (Alič, 2014). However, Cândido et al. (2016) argue that decertified companies do not typically exhibit abnormal financial performance in the aftermath of decertification, attributing this to the internalization of the standard during their certification period. Additionally, Kafel and Nowicki (2014) emphasize that decertified firms may continue to operate (at least partially) the Quality Management System (QMS), thereby saving on recertification costs, which could align with the findings of Cândido et al. (2016). The significance of this topic, the conflicting viewpoints present in the literature, and the absence of research addressing other potential consequences of decertification (refer to Table 1) justify the formulation of this paper's final research question:

**RQ7:** What are the corporate consequences resulting from ISO 9001 decertification?

Table 1 provides a summary of all studies investigating ISO 9001 decertification from the perspective of decertified organizations, revealing that most of the research questions addressed in this study are novel to the literature. For instance, research questions RQ1 to RQ3 and RQ5 have not been previously explored or were only partially examined in one study. Kafel and Nowicki (2014) assess whether the certification motivations of decertified companies (RQ1) are internal or external, but they do not specifically identify the certification motivations. Alič (2014) solely investigates the certification's impact on the financial performance of firms that subsequently decertify (RQ3), without analysing other certification benefits. Moreover, Alič (2014) and Hernandez-Vivanco & Bernardo (2023) concentrate on the financial ramifications of certification loss (RQ7) without delving into other post-decertification impacts. Lastly, Chiarini (2019) does not differentiate conceptually between maintenance problems (RQ5) and withdrawal motivations (RQ6), only exploring the latter research question. While research questions RQ4 and RQ7 have been explored by one study each, and RQ6 by five papers, the research remains limited, and the results are largely contentious, particularly regarding withdrawal motivations (RQ6) and the consequences of decertification (RQ7).



### 3. Methodology

#### 3.1. Population and sampling procedure

The study's target population consists of 237 Portuguese firms that lost their ISO 9001 certification in 2015, identified through the Portuguese Institute of Accreditation (IPAC) database. A total of 83 companies, approximately one-third of this population, were randomly selected for participation. Telephone contact was attempted with all selected companies to confirm their operational status and decertification in 2015. The research team was unable to reach 11 firms, and an additional 8 had incorrect or untraceable telephone numbers. Furthermore, 6 firms stated that they did not lose their ISO 9001 certification in 2015. Ultimately, 58 firms were deemed eligible for the study, all of which explicitly agreed to participate. Subsequently, a questionnaire link was emailed to these 58 companies, and 27 provided valid responses, resulting in a response rate of 46.6%. Data collection occurred in January and February of 2018. The two-year gap between the decertification event and the data collection process is attributed to the periodicity of the IPAC database, which provided data up to the year 2015 at the beginning of 2018.

**Table 1.** Literature investigating ISO 9001 decertified firms

Study	Alič (2014)	Kafel & Nowicki (2014)	Cândido et al. (2016)	Simon & Kafel (2018)	Chiarini (2019)	Hernandez-Vivanco & Bernardo (2023) <sup>a</sup>
Objective	Determine how firms operate after decertification	Determine decertification motivations and repercussions	Determine the impact of decertification on performance	Determine decertification motivations	Determine decertification motivations	Determine the impact of decertification on performance
Method	Longitudinal survey	Case study	Event study	Descriptive survey	Delphi method and survey	Longitudinal, SFA
RQ1: Motivations	n/a	n/a*	n/a	n/a	n/a	n/a
RQ2: Obstacles	n/a	n/a	n/a	n/a	n/a	n/a
RQ3: Benefits	n/a*	n/a	n/a	n/a	n/a	n/a
RQ4: Weaknesses / disadvantages	n/a	Identifies three weaknesses	n/a	n/a	n/a	n/a
RQ5: Maintenance problems	n/a	n/a	n/a	n/a	n/a*	n/a
RQ6: Decertification motivations	Identifies decertification motivations	Identifies decertification motivations	Identifies decertification motivations	Identifies decertification motivations	Identifies decertification motivations	n/a
RQ7: Withdrawal consequences	n/a*	Identifies features of QMS that continue to operate	n/a*	n/a	n/a	n/a*

Notes: The table only considers studies that investigate ISO 9001 decertified firms. <sup>a</sup> Hernandez-Vivanco & Bernardo (2023) consider different stages of the certification process, but not all from the perspective of the decertified firm. n/a: Not addressed/Not identified. \*Partial analysis only. SFA: Stochastic frontier analysis.

Table 2 presents summary statistics for the 58 eligible firms, utilizing data obtained from the AMADEUS database for the fiscal year 2018,<sup>2</sup> coinciding with the survey period for this paper. The table indicates that the eligible firms primarily consist of micro or small enterprises, based on both employee count and total sales benchmarks. Most of these firms (39.0%) employ between 10 and 49 individuals and generate sales of less than 2 million euros (52.5%). Additionally, descriptive statistics reveal that only 22.7% of eligible firms are not profitable, with the majority (75.6%) belonging to a corporate group. The most prominent activity sectors among these firms include manufacturing (34.8%), wholesale and retail trade, motor vehicle

<sup>2</sup> Since the questionnaire is anonymous, the researchers are unable to identify with certainty which of the 58 eligible firms answered the questionnaire. Hence, this paper presents summary statistics for 58 companies and not the actual 27 firms in the sample.



and motorcycle repair (15.2%), and professional, scientific, and technical activities (13.0%).

### 3.2. Questionnaire design

The questionnaire comprises seven questions, aligning with the seven research questions of the study. Each question prompts respondents to select from a predefined set of options, with provisions for additional comments if desired. These predefined options are derived from the authors' literature review. The questions are phrased in neutral language, featuring straightforward instructions and clear wording to ensure easy interpretation. Precautionary measures were implemented ex-ante to mitigate common-method bias (Chang et al., 2010). These measures include assuring respondents of the anonymity of their responses, emphasizing that there are no correct or incorrect answers, and encouraging honesty in all responses.

**Table 2.** Descriptive statistics of eligible firms for the 2018 fiscal year

Variable	Frequency	Percentage
<b>Employees number</b>		
< 10	12	29.3
[10, 49]	16	39.0
[50, 249]	12	29.3
≥ 250	1	2.4
Total	41	100.0
<b>Sales (millions of euros)</b>		
≤ 2	21	52.5
]2, 10]	14	35.0
]10, 43]	5	12.5
> 43	0	0.0
Total	40	100.0
<b>Return on Assets</b>		
≤ -10%	0	0.0
] -10%, 0%]	10	22.7
]0%, 10%]	28	63.6
> 10%	6	13.6
Total	44	100.0
<b>Number of companies in corporate group</b>		
0	11	24.2
[1, 5]	25	55.6
> 5	9	20.0
Total	45	100.0
<b>Industry (NACE Classification)</b>		
Manufacturing	16	34.8
Wholesale, retail trade, and repair of motor vehicles and motorcycles	7	15.2
Professional, scientific, and technical activities	6	13.0
Administrative and support service activities	4	8.7
Construction	3	6.5
Transportation and storage	3	6.5
Information and communication	2	4.3
Other	5	10.9
Total	46	100.0

Note: Differences between totals and eligible firms (n=58) are missing values in AMADEUS database.

### 3.3. Randomness and non-response bias tests

Following the data collection process, two statistical tests were employed to evaluate sample randomness and potential non-response bias. Firstly, the non-parametric runs test was conducted. In all cases, the null hypothesis of sample randomness was not rejected, as the significance level of each individual test exceeded 0.05. Subsequently, the Kruskal-Wallis non-parametric test was utilized to ascertain the extent of variance between earlier and later responses. Across all variables, the p-values derived from this test surpassed 0.05, indicating a lack of evidence supporting bias. Thus, given the precautions taken to mitigate bias and the outcomes of these tests, it can be inferred that there are no significant differences between



respondents and non-respondents. Collectively, the results of both tests suggest that the responses obtained from the 27 sample firms are suitable for examining the seven research questions, as they indicate sample randomness and the absence of non-response bias.

### 3.4. Data analysis and power of the statistical tests

The data analysis encompasses several components: descriptive statistics for each research question, binomial tests of hypotheses for motivations and benefits, and correlation analysis among all research variables. The aim is to scrutinize the principal motivations and barriers in the pre-certification phase, shedding light on reported benefits during the post-certification phase, as well as maintenance issues and certification weaknesses. These findings, consequently, contribute to understanding the motivations for decertification and the ensuing consequences among the sample firms in the final certification stage. Moreover, the correlations furnish additional empirical evidence regarding the relationships across certification stages.

The power of the binomial tests conducted in this study was assessed using both SPSS and the G\*Power software (Faul et al., 2007). With a significance level of  $\alpha=5\%$ , a test proportion of  $\pi=0.51$ , and an effect size of 0.30, the binomial tests achieved a power level of  $\beta=94.4\%$ . For a commonly adopted power level of  $\beta=80\%$ , a minimum sample size of  $n=16$  would be necessary. Therefore, the power level ( $\beta=94\%>80\%$ ) and the sample size ( $n=27>16$ ) are both adequate for conducting the statistical tests. Nevertheless, given that the sample size might be deemed small by certain standards, caution should be exercised in interpreting the results.

## 4. Results

### 4.1. Motivations of decertified firms to initially obtain an ISO 9001 certification

Table 3 presents an overview of the motivations compelling decertified firms to initially pursue ISO 9001 certification. The 27 respondents collectively identify 78 motivations, averaging 2.9 motivations per firm. Notably, the most frequently cited motivations include enhancing market share, enhancing the firm's image, and optimizing internal organization, each cited by 33.3% of the sample firms. Additionally, the table highlights other significant motivations, such as the imperative to streamline production cycles and address marketing concerns (mentioned by 29.6% of respondents), bolstering competitive advantages in exports and demonstrating the ability to offer high-quality products (acknowledged by 25.6% of the firms), and responding to client pressure (acknowledged by 22.2% of respondents).

**Table 3.** Motivations of decertified firms to initially obtain ISO 9001 certification

Motivations for ISO 9001 certification	Rank	Frequency	Percentage of firms
Increase market share (E)	1	9	33.3
Improve firm image (E)	1	9	33.3
Improve internal organisation (I)	1	9	33.3
Improve production cycle (I)	4	8	29.6
Marketing related issues (E)	4	8	29.6
Obtain competitive advantage on exports (E)	6	7	25.9
Prove capacity to trade high-quality products (E)	6	7	25.9
Client pressure (E)	8	6	22.2
Improve and simplify documented processes (I)	9	5	18.5
Improve product quality (I)	10	4	14.8
Reduce firm's costs (I & E)	10	4	14.8
Obtain the preference of demanding foreign customers (E)	12	1	3.7
Represent a large international player (E)	12	1	3.7
Total responses (average number of responses per firm)	-	78 (2.9)	-

Note: I: internal. E: external.



Table 3 suggests that the primary impetus for the sample firms' initial ISO 9001 certification lies predominantly in external motivations. Specifically, out of the three principal motivations identified, only one is internal (i.e., improving internal organization). Moreover, among the eight main motivations outlined, only two are internal (i.e., improving internal organization and production cycle). A binomial test does not reject the hypothesis that most firms ( $\geq 51\%$ ) initially seek certification due to external motivations ( $p=0.822$ , one-tailed).

#### **4.2. Barriers perceived by decertified firms during the pre-certification period**

Table 4 presents an overview of the barriers perceived by decertified firms during their pre-ISO 9001 certification period. The data reveals that nearly 60% of respondents identify the cost of the certification process as the most significant barrier during this stage. Additionally, 40.7% highlight the excessive formality, complexity, and duration of the ISO 9001 certification process, commonly referred to as bureaucracy. Third and fourth critical barriers, according to the available data, include concerns about insufficient returns from ISO 9001 certification (22.2%) and the high expectations placed on certification outcomes (22.2%). Although less frequently reported, other barriers are associated with challenges in internalizing the standard, such as insufficient top management commitment and resources, employee resistance to change, misunderstanding of the standard, limited time to achieve certification, and non-compliance with the standard.

**Table 4.** Barriers perceived by decertified firms during the pre-ISO 9001 certification period

Barriers in the pre-ISO 9001 certification period	Rank	Frequency	Percentage of firms
High cost of the process	1	16	59.3
Formality, complexity, and duration of the process (bureaucracy)	2	11	40.7
Fear of obtaining low returns from certification	3	6	22.2
Excessive firm expectations	3	6	22.2
Short period of time to achieve certification	5	4	14.8
Lack of compliance with the standard requirements	5	4	14.8
Lack of top management commitment	7	3	11.1
Alternative certifications	7	3	11.1
Small size of the firm	7	3	11.1
Lack of resources	10	2	7.4
Young age of the firm	11	1	3.7
Quality policy of the firm	11	1	3.7
Lack of understanding of the standard	11	1	3.7
Employee resistance to change	11	1	3.7
Total responses (average number of responses per firm)	-	62 (2.3)	-

Previous results, in Table 3, indicate that the primary motivations for initial ISO certification are external, focusing on enhancing the firm's image and expanding market share. Since extracting economic benefits (efficiency improvements) through improvement of their internal processes (internalisation of the standard) is not the main motivation of these companies, it is understandable why respondents in Table 4 cite cost and bureaucracy as the primary obstacles encountered during the pre-certification period. This also explains why most sample firms do not emphasize the significance of barriers such as lack of management commitment, resource constraints, resistance to change, and misunderstanding of the standard. These obstacles would likely be more pertinent for organizations aiming to internalize the standard, a goal that appears less prevalent among the surveyed respondents.

#### **4.3. Benefits of the ISO 9001 certification for decertified firms**

Table 5 illustrates the benefits derived from ISO 9001 certification for the surveyed firms. All 27 respondents report at least one benefit, averaging 2.6 benefits per firm. The top three benefits identified include improved documentation organization (55.6%), enhanced organizational



image (33.3%), and access to new domestic and international markets (29.6%). Consistent with the previously identified external motivations, the primary benefits reported by the respondents are also predominantly external. Notably, internal aspects such as enhanced efficiency in resource management and improved production processes only rank fourth and seventh, respectively. Therefore, it is unsurprising that a nonparametric binomial test confirms that most sample firms ( $\geq 51\%$ ) predominantly experienced external benefits ( $p=0.232$ , one-tailed).

**Table 5. Benefits of ISO 9001 certification in firms that subsequently decertified**

Benefits of ISO 9001 certification	Rank	Frequency	Percentage of firms
Organisation of documentation (I)	1	15	55.6
Improvement of firm image (E)	2	9	33.3
Entry into new national and international markets (E)	3	8	29.6
Higher efficiency in resources management (I)	4	7	25.9
Improvement of clients' satisfaction and trust (E)	4	7	25.9
Improvement in the quality of firm's facilities (I)	6	6	22.2
Improvement of production processes (I)	7	5	18.5
Improvement of on time product delivery (I)	7	5	18.5
Improvement of internal communication (I)	7	5	18.5
Improvement of market positioning (E)	10	3	11.1
Improvement of product/service quality (I)	11	2	7.4
Increase on firm's value (E)	11	2	7.4
Increase in staff satisfaction (I)	11	2	7.4
Increase on revenues (I & E)	14	1	3.7
Authorization to distribute an international brand (E)	15	1	3.7
Increase in profit margin (I & E)	-	0	0.0
Total responses (average number of responses per firm)	-	78 (2.9)	-

Note: I: internal. E: external.

Table 5 also indicates that the sample firms did not report a significant financial impact resulting from their ISO 9001 certification. Specifically, only 7.4% noted an increase in their value, and 3.7% mentioned an increase in revenues. Interestingly, none of the respondents reported an increase in the profit margin. These results clearly suggest that the sample firms overlooked the internal certification drivers, failing to capitalize on the full potential of certification.

**Table 6. Weaknesses of ISO 9001 certification in firms that subsequently decertified**

Weaknesses of ISO 9001 certification	Rank	Frequency	Percentage of firms
Certification costs	1	21	77.8
Excessive bureaucracy and documentation	2	10	37.0
Short-term benefits that stagnate following the process	2	10	37.0
Does not reduce unit production cost	4	8	29.6
Firms can maintain their performance after decertifying	4	8	29.6
Does not increase labour productivity	6	7	25.9
External benefits dissipate as competitors are also able to certify	7	6	22.2
Negative impact on the quality of firm's facilities	8	3	11.1
Does not increase market share	8	3	11.1
Does not account for industry-specific needs	10	2	7.4
Negative impact on firm's profits	10	2	7.4
Negative impact on firm's image	12	1	3.7
Negative impact on firm's market positioning	12	1	3.7
Does not increase client's satisfaction	12	1	3.7
Total responses (average number of responses per firm)	-	83 (3.1)	-

#### ***4.4. Weaknesses of the ISO 9001 certification from the perspective of decertified firms***

The weaknesses of ISO 9001 certification are also explored in the questionnaire. Table 6 summarizes the results, clearly showing that the cost of certification is the most significant aspect to be considered in this context. In fact, 77.8% of respondents state that the process is



too costly, which is seen as a clear disadvantage. Additionally, 37.0% mention that ISO 9001 is too bureaucratic, and that the short-term benefits quickly stagnate following the certification process. Interestingly, almost 30% of the respondents claim that they might be able to maintain their performance after decertifying, and a similar proportion questions the process's inability to reduce unit production costs and increase labour productivity.

The weaknesses reported by the sample firms, namely the short-term benefits that quickly stagnate (37.0%), the dissipation of external benefits (22.2%), and the absence of improvements in production cost (29.6%) and labour productivity (25.9%), seem to be a consequence of the fact that most of them pursue their ISO 9001 certification due to external motivations. Table 6, and in particular, the top seven weaknesses reported therein, clearly suggest that the majority of the respondents are not firmly committed to the goal of achieving continuous improvement.

#### 4.5. ISO 9001 certification maintenance problems

Table 7 summarizes the ISO 9001 certification maintenance problems reported by the sample firms. All the recorded responses pertain to internal problems, averaging 2.1 problems per firm. The top three issues are the lack of updates in internal procedures (40.7%), procedures not being executed as defined (33.3%), and a deficiency in encouraging continuous improvement (25.9%). Remarkably, all these maintenance problems are associated with a lack of commitment to continuous improvement. The remaining issues typically revolve around human resource management topics, such as a lack of communication and internal auditors or inadequate auditing, as well as deficiencies in commitment, training, and understanding the standard. These problems reinforce the idea that most of the sample firms do not prioritize the goal of continuous improvement, as noted earlier in this paper.

**Table 7.** ISO 9001 maintenance problems in firms that subsequently decertified

ISO 9001 maintenance problems	Rank	Frequency	Percentage of firms
Procedures not updated according to current best practices	1	11	40.7
Procedures not performed as defined and documented	2	9	33.3
Continuous improvement not stimulated	3	7	25.9
Difficulty to communicate with staff working outside facilities	3	7	25.9
Insufficient internal auditors	5	4	14.8
Lack of staff commitment	5	4	14.8
Internal auditing not taken seriously	5	4	14.8
Lack of top management commitment	8	3	11.1
Lack of performance assessment	8	3	11.1
Lack of communication between top management, quality team, and staff	8	3	11.1
Staff's lack of understanding about the quality system	11	1	3.7
Staff's lack of training	11	1	3.7
Total responses (average number of responses per firm)	-	57 (2.1)	-

#### 4.6. Reasons for the ISO 9001 decertification

Table 8 summarizes the reasons provided by the sample firms to justify their ISO 9001 decertification. As shown, a total of 62 motivations are provided, averaging 2.3 motivations per respondent. The available evidence suggests that the primary reason for decertification is the poor cost-benefit relationship of certification (59.3%). Importantly, the economic crisis impacting Portugal in the period from 2013 to 2015 is mentioned by 37.0% of the respondents as a reason for decertification. The sample firms also cite issues such as the lack of compliance with the standard requirements (29.6%), certification expiration (29.6%), and a lack of interest in certification renewal (18.5%).

**Table 8.** Reasons for the ISO 9001 decertification

ISO 9001 decertification reasons	Rank	Frequency	Percentage of firms
Cost-benefit relationship of the certification	1	16	59.3
Economic crisis	2	10	37.0
Lack of compliance with the standard requirements	3	8	29.6
Certification expiration	3	8	29.6
Lack of interest for certification renewal	5	5	18.5
Firm's organisational changes	5	5	18.5
Excessive documentation to maintain certification	7	4	14.8
Certification is just a minimum requirement	8	3	11.1
External audit not conducted	9	2	7.4
Termination of contract with the brand that required certification	10	1	3.7
Total responses (average number of responses per firm)	-	62 (2.3)	-

Overall, the findings presented in Table 8 are consistent with the earlier conclusions of this paper, indicating that internal motivations do not primarily drive ISO certification among the sampled firms. Consequently, this lack of internal drive, as suggested by motivations 3, 4, and 5 in Table 8, translates into a reduced commitment towards the goal of continuous improvement. Such a scenario elucidates why a majority of these companies express agreement regarding the suboptimal cost-benefit ratio associated with the certification process, as indicated by motivation 1. Moreover, amidst an economic crisis context, as indicated by motivation 2, these companies might have experienced a decline in sales, further skewing the cost-benefit relationship towards the cost side. Consequently, through decertification, these companies can circumvent the expenses tied to certification and achieve some level of cost savings.

#### 4.7. Consequences of the ISO 9001 decertification

The final research question aims to understand the consequences of losing the ISO 9001 certification. Table 9 reveals that the sample firms mention 99 different consequences, averaging 3.7 per firm. Surprisingly, this study finds that most respondents claim that losing their certification does not result in a loss of production (63%), sales (55.6%), client satisfaction (40.7%), or profit (37.0%). In fact, given the framing of the questionnaire, it is plausible that some of the sample firms experienced an increase in these variables.

**Table 9.** Consequences of ISO 9001 decertification

Consequences from the ISO 9001 decertification	Rank	Frequency	Percentage of firms
No change or increase in production	1	17	63.0
No change or increase in sales	2	15	55.6
No change or increase in number of employees	3	12	44.4
No change in clients' satisfaction	4	11	40.7
No change or increase in profits	5	10	37.0
Reduction in number of employees	6	6	22.2
Reduction in exports	7	5	18.5
No change in assets	7	5	18.5
Financial problems	9	4	14.8
Decrease in clients' satisfaction	10	2	7.4
Decrease in sales	10	2	7.4
Decrease in profits	10	2	7.4
Decrease in assets	10	2	7.4
No change in exports	10	2	7.4
Changes in top management	10	2	7.4
Decrease in production	16	1	3.7
Decrease in customers' trust on the firm	16	1	3.7
Total responses (average number of responses per firm)	-	99 (3.7)	-

However, some firms report the opposite type of consequences, namely, a decrease in client satisfaction (7.4%), sales (7.4%), profits (7.4%), and assets (7.4%). Additionally, some



firms mention financial problems after losing their ISO 9001 certification (14.8%), and a reduction in their exports (18.5%). There are a total of nine companies in this group experiencing some decline in performance. In untabulated results, a thorough analysis of the responses from these companies reveals that the emphasis on external motivations and benefits is even stronger for them. In fact, the four most frequent motivations are external (prove capacity to trade high-quality products, obtain a competitive advantage in exports, increase market share, and improve firm image), as well as the three most frequent benefits (improvement of firm image, entry into new national and international markets, and improvement of client satisfaction and trust). Accordingly, these companies exhibit similar problems of lack of internalization (continuous improvement not stimulated, procedures not updated according to current best practices, internal auditing not taken seriously, and insufficient internal auditors).

#### 4.8. Correlation analysis

The analysis conducted thus far suggests the presence of potential significant relationships between the various stages of the certification (and decertification) process. Specifically, the evidence presented in this paper indicates that external motivations predominantly lead to external benefits, accompanied by a host of internal maintenance problems and several certification weaknesses. Decertification emerges as a consequence, reflecting a disillusionment with the certification process itself. This assertion finds support from many of the sample firms, who assert that their performance either remains stable or even improves in the period following ISO withdrawal. To delve deeper into this theme, correlation analysis is employed, utilizing the number of responses provided by sample firms to each of the research questions considered in this study.

**Table 10.** Correlations between number of responses to each research question

Variables	CERTMOT	BAR	BEN	WEAK	MPROB	DECMOT
Certific. motivations (CERTMOT)						
Barriers (BAR)	0.155					
Benefits (BEN)	0.393**	0.348*				
Weaknesses (WEAK)	0.081	0.010	-0.013			
Maintenance problems (MPROB)	0.081	0.361*	0.461**	0.065		
Decertif. Motivations (DECMOT)	0.227	0.115	0.168	-0.059	0.033	
Consequences (CONS)	0.145	0.057	0.361*	0.339*	0.199	0.332*

Note: \*Significant at 10 percent level, \*\*Significant at 5 percent level.

Table 10 presents the results of the correlation analysis. Notably, this study uncovers a significant correlation between CERTMOT and BEN (0.393,  $p=0.043$ ), indicating that the number of motivations identified by respondents aligns with the number of benefits reported by the same respondents. Additionally, significant correlations are observed between the number of barriers and the number of benefits (0.348,  $p=0.075$ ), the number of barriers and the number of maintenance problems (0.361,  $p=0.064$ ), the number of maintenance problems and the number of benefits (0.461,  $p=0.016$ ), the number of benefits and the number of decertification consequences (0.361,  $p=0.064$ ), the number of weaknesses and the number of consequences (0.339,  $p=0.083$ ), and the number of decertification motivations and decertification consequences (0.332,  $p=0.091$ ). While most correlations in Table 10 do not reach significance, each stage exhibits at least one variable significantly correlated with another variable from a different stage. Notably, certification benefits demonstrate correlations with several variables, and decertification consequences are linked to certification benefits, certification weaknesses, and certification withdrawal motivations. These findings, in conjunction with the preceding descriptive analysis, suggest that all three stages of the process leading to decertification display significant correlations.

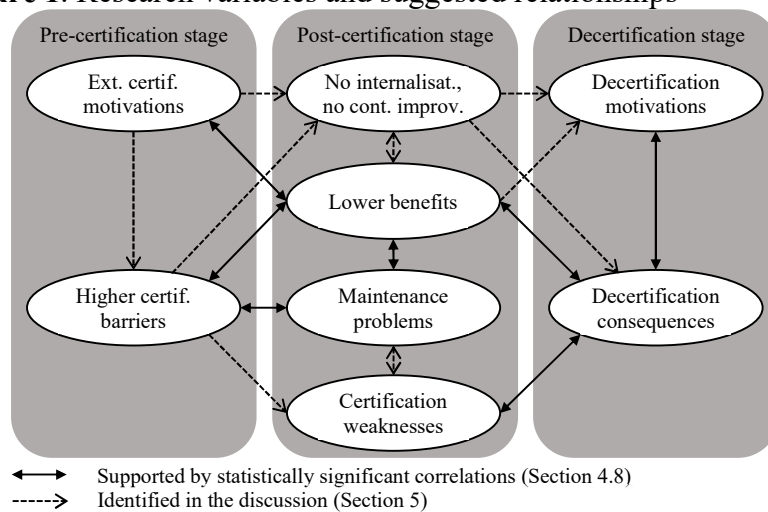
However, it's crucial to approach further analysis of these frequencies with caution. Readers seeking additional insights from these results must acknowledge that the data represents frequencies of response rather than the intensity of the response (e.g., motivations, barriers). Therefore, the magnitude of correlations, signs of some correlations, and the corresponding statistical tests should be interpreted in light of the nature of the data.

### 5. Discussion and contributions

This study illuminates the escalating trend of ISO 9001 decertification, which affects numerous firms each year (Cândido et al., 2021). By scrutinizing the pre-certification, post-certification, and decertification phases (refer to Figure 1), it furnishes insights into the comprehensive journey culminating in certification withdrawal. Furthermore, the research provides a distinctive depiction of certification motivations, barriers, benefits, weaknesses, maintenance problems, withdrawal rationales, and decertification repercussions from the perspective of decertified firms.

This paper unveils that the primary motivations behind initial ISO 9001 certification stems predominantly from external factors, an important finding given previous research linking such motivations to reduced benefits and heightened implementation obstacles (Prajogo, 2011; Sampaio et al., 2014; Djofack & Camacho, 2017; Sun et al., 2019). The absence of internal motivations to embrace ISO 9001 suggests that the surveyed firms lack a commitment to internalizing this standard, likely viewing certification merely as a marketing tool (Boiral & Roy, 2007; Lo & Chang, 2007; Sampaio et al., 2014). The failure to internalize the standard elucidates why decertified companies highlight cost, bureaucracy, non-compliance with the standard, and apprehension about future returns as the most significant obstacles in the certification process. Indeed, internally motivated firms are more inclined to prioritize barriers such as resource scarcity, resistance to change, and inadequate understanding of the standard - issues less frequently cited by respondents in this study. These findings imply that such firms did not undertake initiatives conducive to standard internalization, such as experimentation, pilot tests, training, and change management (e.g., Esgarrancho & Cândido, 2020; Sfakianaki & Kakouris, 2020; Cândido, 2024). This paper's conclusions are noteworthy and original, as prior research has not delved into the certification motivations or barriers of decertified firms.

**Figure 1.** Research variables and suggested relationships



The analysis of the post-certification period suggests that the decertified firms in the sample fail to fully capitalize on ISO 9001 certification. Indeed, only a quarter of the



respondents mention an increase in client satisfaction, which is unsurprising given that client satisfaction is not a primary motivation for the certification process (Cf. Table 3). Moreover, the sample firms do not emphasize any significant financial benefits stemming from their ISO 9001 certification, a discrepancy with much of the existing research (e.g., Ochieng et al., 2015; Islam et al., 2016; Siougle et al., 2019; Liu et al., 2021; Siougle & Dimelis, 2021). Instead, two of the three most frequently cited benefits by the sample firms - firm image, and entry into new markets - align with the external motivations of these firms (Boiral & Roy, 2007; Sampaio et al., 2014; Djofack and Camacho, 2017). Additionally, respondents rarely cite internal benefits such as resource efficiency, process improvement, and delivery time improvement when queried about their ISO post-certification benefits. Taken together, these results strongly suggest a lack of internalization of the standard by most of the sample firms. This conclusion aligns with the motivations and barriers identified during the pre-certification period, which also indicate a lack of interest in internalizing the standard.

The motivations and barriers identified by the sample firms during the pre-certification period, together with the lack of perception of significant internal benefits during the post-certification period, are crucial for understanding why these companies report several certification weaknesses and subsequently, decertify. The most frequently cited weaknesses - costs of certification, bureaucracy, short-term benefits, and lack of improvement in labour productivity and unit production costs - suggest that the respondents do not make a sustained effort to achieve continuous improvement (Boiral & Roy, 2007; Wahid & Corner, 2009, 2011; Kafel & Nowicki, 2014; Ferreira & Cândido, 2021), particularly regarding short-term benefits and productivity improvement. This conclusion is consistent with the previous discussion of the research results, reinforcing the notion that most of the sample firms do not internalize the ISO 9001 standard.

This paper also demonstrates that the sample firms faced certification maintenance problems. The three most frequently mentioned are obsolete procedures, disregard of documented procedures, and lack of stimulus for continuous improvement, all of which underscore the lack of process improvement in the sample firms due to their unique ISO 9001 certification. Continuous improvement is, however, a crucial standard requirement and has been recognized as vital for the success of the certification process (Terziovski & Guerreiro, 2014; Djofack & Camacho, 2017; Castka, 2018). Therefore, based on the evidence collected in this research, the post-certification stage is characterized by infrequent internal benefits and reveals low internalization of the standard. Additionally, firms report several weaknesses and maintenance problems with their ISO 9001 certification, suggesting that they are unable to sustain continuous improvement, a likely result of the motivations and barriers identified in the pre-certification stage. This paper's findings are relevant and original because previous research did not identify the certification benefits, weaknesses, and maintenance problems of decertified firms, which this study directly addresses. Moreover, the correlation results highlight several links between motivations, barriers, benefits, and maintenance problems ( $r=0.393$ ,  $p=0.043$ ;  $r=0.348$ ,  $p=0.075$ ;  $r=0.361$ ,  $p=0.064$ ), which are also original results for decertified firms and merit further exploration in future research.

The last part of this paper explores the post-decertification period. Evidence indicates that decertification is often driven by an unfavourable cost-benefit ratio during the certification period, consistent with the conclusions drawn by Lo and Chang (2007), Kafel and Nowicki (2014), Sansalvador and Brotons (2015), and Chiarini (2019). Additionally, this paper documents various other reasons for decertification, including non-compliance with standard requirements or audits, or simply allowing the certificate to lapse. Furthermore, a minority of the sampled firms (three firms) decertify because they view ISO 9001 merely as a minimum requirement, indicating a need or desire for a more advanced QMS. This discovery aligns with studies suggesting that ISO 9001 decertification is not predominantly driven by economic



factors (Cândido et al., 2021) and with research indicating the existence of a smaller yet significant cohort of organizations decertifying as they have already internalized the standard and seek to adopt more sophisticated QMSs (Cândido & Ferreira, 2023; Ferreira & Cândido, 2021).

Finally, there is clear evidence that decertification leads to very heterogeneous outcomes, challenging previous research suggesting a more uniform scenario (Cf., Alič, 2014; Kafel and Nowicki, 2014; Cândido et al., 2016). Many sample firms claim that losing their ISO 9001 certification does not result in a significant loss in their production level, sales volume, company size (employee number), client satisfaction, or profits. This is consistent with the results of Cândido et al. (2016), which concluded that decertification has no negative impact on economic-financial performance. However, a subset of nine companies (33.3%) report the opposite, suggesting that, in certain circumstances, decertification facilitates financial distress. This is, in turn, consistent with the results of Alič (2014), which reported financial distress and firm bankruptcies after decertification. The study findings are relevant since research is yet to reach a consensus on the motivations for decertification and its consequences (Ferreira & Cândido, 2021; Cândido & Ferreira, 2022, 2023). The present study contributes to this ongoing debate as it explores these issues from the perspective of the decertified firms and the whole process of certification-decertification. Accordingly, this study suggests that there may be different groups of decertified companies, each with different certification histories and decertification consequences. In fact, this paper establishes that the decertification consequences are correlated with certification benefits and weaknesses, as well as decertification motivations (respectively,  $r=0.361$ ,  $p=0.064$ ;  $r=0.339$ ,  $p=0.083$ ;  $r=0.332$ ,  $p=0.091$ ).

## **6. Conclusion, implications, and further research**

This study adds to the scarce number of papers addressing the reasons for ISO 9001 decertification. The study contributes to this research by characterizing the stages of the encompassing process leading up to decertification. In fact, results suggest that such event starts in the pre-certification period, as firms overemphasize the external motivations for certification and, at the same time, minimize the internal ones. Such motivational pattern indicates that many of the sample firms had no intention to internalise the standard right from the start. Similarly, the implementation obstacles they report suggest that internalisation of the standard is not a (main) concern. This conclusion explains why such companies perceive that the most important benefits from certification are organisation of documentation, firm image, and entry into new markets. At the same time, the lack of internal benefits from the ISO 9001 certification suggests that the sample firms are unable to take full advantage of the certification process. This is a very important conclusion that impacts the remaining certification stages. In accordance, this paper shows that the main difficulties faced by the sample firms in the maintenance stage are (directly and indirectly) related to the lack of continuous improvement resulting from their low ISO 9001 internalisation. Moreover, the results show that most firms decertify because their certification process fails to produce an adequate cost-to-benefit relationship. The actual decertification event triggers very heterogeneous responses. Most of the sample firms claim that it does not negatively affect critical dimensions such as production, sales, profits, and costumers' satisfactions, while others seem to experience exactly the opposite situation.

### **6.1. Implications for theory**

This research underscores the vital role of a comprehensive understanding of ISO 9001 certification's three pivotal stages: implementation, maintenance, and decertification. It



highlights that successful certification hinges on adept navigation through these phases, encompassing preparation, implementation, and sustained QMS maintenance. Unlike previous studies that overlooked the interrelation between these stages (e.g., Alič, 2014; Kafel and Nowicki, 2014; Cândido et al., 2016; Simon and Kafel, 2018; Chiarini, 2019), this study reveals that decertification stems from a failure to navigate them correctly.

Furthermore, this study introduces a comprehensive model (refer to Figure 1) illustrating potential relationships among key variables throughout the certification-decertification process. While some relationships find support through frequency and correlation analyses, others necessitate empirical validation, emphasizing the need for further research to substantiate these associations. By establishing this framework, the study provides valuable guidance for future empirical inquiries, fostering a deeper understanding of pertinent relationships.

Additionally, the proposed framework builds upon the model developed by Camango and Cândido (2024), incorporating several key variables and organizing them according to the sequential stages of the certification-decertification process. This new depiction enhances comprehension of this process, providing a valuable contribution to the field.

Moreover, this study contributes significantly by conducting a robust analysis of empirical data collected and analysed across seven key research questions. These inquiries delve into critical aspects of the certification-decertification process, offering original insights, particularly from the perspective of decertified firms. The data, gathered for the first time through the lens of these firms, offers a unique vantage point, enriching the understanding of the field by providing valuable insights into the challenges and dynamics surrounding ISO 9001 decertification.

Lastly, the research suggests the existence of distinct groups of decertified firms, each characterized by unique motivations, certification processes, and consequently, different consequences of decertification. This finding extends Ferreira and Cândido's (2021) suggestion that certification consequences vary among certain groups of companies, challenging the prevailing notion of a more homogeneous scenario (Cf., Alič, 2014; Kafel and Nowicki, 2014; Cândido et al., 2016).

## ***6.2. Implications for practice***

This study offers valuable guidance for managers of firms seeking ISO 9001 certification, as well as for consultants assisting them, registrars, and other certification authorities, including ISO and national quality management bodies like IPQ and IPAC in Portugal. The research highlights the paramount importance of addressing internal issues throughout the ISO 9001 certification process to maximize its benefits. Managers are urged to actively engage in preparing for, implementing, and maintaining the certification, fostering internalization of the standard and driving sustained improvement within the organization. To this end, managers should remain vigilant regarding internal certification motivations, barriers to internalization, and challenges in maintaining continuous improvement. Additionally, considering the adoption of other standards that share the ISO high-level structure (HLS), such as ISO 14001 and OHSAS 18001, could be beneficial. Previous studies suggest that implementing these standards alongside ISO 9001 may enhance the overall benefits (Wiengarten et al., 2017; Hernandez-Vivanco and Bernando, 2023), potentially reducing maintenance problems and motivations for decertification. By embracing these insights and strategies, firms can optimize their ISO 9001 certification process and reap the associated rewards while minimizing potential challenges.

As for companies that have lost their certification, the decision to pursue recovery warrants careful consideration. Losing certification may indicate that, for most decertified companies, the initial certification was not thoroughly considered. In any case, the decision to



pursue recovery should be based on an objective analysis of the situation, including an evaluation of the motivations for recertification, potential benefits, and anticipated challenges. Are the motivations primarily external, or can they be transformed into internal drivers?<sup>3</sup> Have the challenges and obstacles remained consistent, or have there been changes that might facilitate internalization of the standard? These are critical questions that organizations must address to inform their decision-making process regarding recertification.

Consultants, registrars, and other certification authorities can leverage this study to recognize the impact of biases towards external issues, coupled with the growing trend of decertification, on the relevance and sustainability of the ISO 9001 standard. By understanding these dynamics, they can adjust standards, policies, and practices to identify firms at risk of decertification and mitigate the underlying issues leading to withdrawal. It is recommended that their policies and actions address the entire certification process, from pre-certification to maintenance. Specifically, they should consider the certification motivations, implementation hurdles, weaknesses, and maintenance problems highlighted in this study.

Furthermore, this research underscores the necessity of tailored approaches based on each organization's unique certification motivations, benefits, maintenance challenges, and potential drivers of decertification. Consultants and registrars should be attuned to decertification motivations in each company and address them effectively in their consulting and registrar roles. It is crucial to recognize that decertification motivations do not always translate into decertification. Consulting firms and registrars must adapt their responses accordingly. For example, if a company aims to transition from ISO 9001 to IATF 16949, consultants and registrars should guide them in that direction. However, if there is simply a lack of motivation to recertify by allowing the certificate to lapse, a different approach is warranted. This approach depends on other variables, namely on whether the initial certification motivations were exclusively external or had a moderate amount of internal motivations. If they were sufficiently internal, perhaps the renewal of the certification might be successful, but if the motivations were external and these motivations have vanished (e.g., customers don't require certification anymore), then recertification is probably not recommended (Cândido, 2024). Understanding these nuances enables consultants and registrars to provide tailored guidance, ensuring effective support aligned with each firm's specific circumstances and objectives, as well as a reduction in decertification trends.

Lastly, one of the most cited motivations for decertification is the perceived low cost-benefit ratio. However, many organizations lack a robust performance measurement system to effectively gauge this ratio (Chiarini, 2019). Consultants and registrars can play a crucial role in assisting these companies in developing a more accurate perception of the actual cost-benefit ratio. By providing guidance and support in establishing appropriate performance measurement systems, consultants and registrars empower organizations to make better-informed decisions regarding re/decertification. This proactive approach can help organizations align their certification efforts more closely with their strategic objectives and improve the overall effectiveness and value derived from ISO 9001 certification.

### **6.3. Limitations**

This study has several limitations. First, the sample size is relatively small. Although the related literature considers empirical results based on smaller samples (e.g., Kafel & Nowicki, 2014) and the sample size in this research exceeds the minimum sample size required (Section 3.4), future research should attempt to explore richer datasets with alternative methodologies. Second, the conclusions of this study may be context-dependent because the research is

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<sup>3</sup> Regarding the conversion of external motivations into internal ones, see for instance Prajogo (2011), Kakouris and Sfakianaki (2019), Tari et al. (2020), and Cândido (2024).



conducted in a single country. Hence, future studies should be conducted in other contexts for comparative purposes. Third, the correlation analysis conducted in this research is based on variables representing the number of motivations, number of obstacles, number of benefits, and so on. Although these variables represent the frequency of the main variables of the paper, they do not represent the intensity of the motivations, barriers, and so on. Thus, the magnitude of correlations, signs of some correlations, and the corresponding statistical tests need to be interpreted with caution. Future research should continue to consider the quantitative relationships between these variables, which are rarely analysed but fundamental for the advancement of the field (Chiarini, 2019). Fourth, the study recognises that there may be a different and smaller group of firms (three in this sample) with a completely distinct story to tell. Ferreira & Cândido (2021) noted also that some firms quickly internalise the standard and move on to other more demanding QMS. This less numerous group of firms is not addressed in this study but may be so in future research. Lastly, the approach adopted in this study was based on the analysis of management subjective perceptions, gathered through a self-administered questionnaire. This is a common approach when investigating management initiatives such as ISO 9001 certification. However, future research might also adopt a complementary approach based on objective measures and alternative research methods. Integrating objective measures, such as performance metrics or audit results, and alternative methods, such as case studies or longitudinal studies, could provide a more comprehensive understanding of ISO 9001 certification/decertification and its implications for organizations, enriching future research efforts and contributing to a more nuanced understanding of the topic.

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### **Declaration of generative artificial intelligence (AI) and AI-assisted technologies in the writing process**

In the development of this manuscript, the authors employed an advanced AI language model, ChatGPT 3.5, developed by OpenAI, to enhance the overall readability. Following the application of this AI tool, the authors diligently reviewed and edited the content, acknowledging complete responsibility for the final substance of the publication.

### **Disclosure statement**

The authors have no conflicts of interest to declare.

### **Data availability**

Data will be made available to readers upon request sent to the contact author.



## References

- Aba, E.K., Badar, M.A., & Hayden, M.A. (2016). Impact of ISO 9001 certification on firms financial operating performance. *International Journal of Quality & Reliability Management*, 33(1), 78-89.
- Aggelogiannopoulos, D., Drosinos, E.H., & Athanasopoulos, P. (2007). Implementation of a quality management system (QMS) according to the ISO 9000 family in a Greek small-sized winery: A case study. *Food Control*, 18(9), 1077-1085.
- Albulescu, C., Drăghici, A. Fistiș, G., & Truşculescu, A. (2016). Does ISO 9001 quality certification influence labor productivity in EU-27? *Procedia: Social and Behavioral Sciences*, 221(1), 278–286.
- Alič, M. (2014). Impact of ISO 9001 certification cancellation on business performance: a case study in Slovenian organisations. *Total Quality Management & Business Excellence*, 25(7), 790-811.
- Bangert, M. (2012, June). Management: Make ISO work for you. *Quality Magazine*. Retrieved February 1, 2022, from <https://www.qualitymag.com/articles/88970-management--make-iso-work-for-you>.
- Basir, S.A., & Davis, J. (2018). ISO 9000 maintenance measures: The case of a Malaysian local authority. *Total Quality Management and Business Excellence*, 29(2), 185-201.
- Boiral, O., & Roy, M.-J. (2007). ISO 9000: Integration rationales and organizational impacts. *International Journal of Operations & Production Management*, 27(2), 226–247.
- Bravo, M.I.R. Montes, F.J.L., & Moreno, A.R. (2017). Open innovation and quality management: The moderating role of interorganisational IT infrastructure and complementary learning styles. *Production Planning & Control*, 28(9), 744-757.
- Cai, S., & Jun, M. (2018). A qualitative study of the internalization of ISO 9000 standards: The linkages among firms' motivations, internalization processes, and performance. *International Journal of Production Economics*, 196, 248-260.
- Camango, C., & Cândido, C.J.F. (2023). ISO 9001 maintenance, decertification and recertification: A systematic literature review. *Total Quality Management & Business Excellence*, 34(14), 1764-1796. <https://doi.org/10.1080/14783363.2023.2203379>
- Cândido, C.J.F. (2024). Strategies for the ISO 9001 certification life cycle (StrategISO). *International Journal of Productivity and Performance Management*, 73(6), 1856-1884. <https://doi.org/10.1108/IJPPM-05-2023-0224>
- Cândido, C.J.F., & Ferreira, L.M.F.R. (2022). Determinants of expected performance after ISO 9001 certification withdrawal. *Total Quality Management & Business Excellence*, 33(15), 1691-1717. <https://doi.org/10.1080/14783363.2021.1997142>
- Cândido, C.J.F., & Ferreira, L.M.F.R. (2023). ISO 9001 internal decertification motivations: Exploring barriers and benefits of certification as withdrawal antecedents. *Production Planning & Control*, 34(4), 330-344. <https://doi.org/10.1080/09537287.2021.1916638>
- Cândido, C.J.F., Coelho, L.M.S., & Peixinho, R.M.T. (2016). The financial impact of a withdrawn ISO 9001 certificate. *International Journal of Operations & Production Management*, 36(1), 23-41. <https://doi.org/10.1108/IJOPM-11-2014-0540>
- Cândido, C.J.F., Coelho, L.M.S., & Peixinho, R.M.T. (2021). Why firms lose their ISO 9001 certification: Evidence from Portugal. *Total Quality Management & Business Excellence*, 32(6), 632-651. <http://dx.doi.org/10.1080/14783363.2019.1625266>
- Carvalho, R.S.M.C. and Medeiros, D.M. (2022). A methodology for assessing the main difficulties faced by SMEs in implementing ISO 9001:2015 requirements. *Total Quality Management & Business Excellence*, 33(14), 1674-1690.



- Casadesús, M., & Karapetrovic, S. (2005). Has ISO 9000 lost some of its lustre? A longitudinal impact study. *International Journal of Operations & Production Management*, 25(6), 580-596.
- Castka, P. (2018). Modelling firms' interventions in ISO 9001 certification: A configurational approach. *International Journal of Production Economics*, 201, 163-172.
- Castka, P., Prajogo, D., Sohal, A., & Yeung, A.C.L. (2015). Understanding firms selection of their ISO 9000 third-party certifiers. *International Journal of Production Economics*, 162, 125-133.
- Chang, S.-J., Witteloostuijn, A., & Eden, L. (2010). From the Editors: Common method variance in international business research. *Journal of International Business Studies*, 41(2), 178-184.
- Chatzoglou, P., Chatzoudes, D., & Kipraios, N. (2015). The impact of ISO 9000 certification on firms' financial performance. *International Journal of Operations & Production Management*, 35(1), 145-174.
- Chiarini, A., & F. Brunetti (2019). What really matters for a successful implementation of Lean production? A multiple linear regression model based on European manufacturing companies. *Production Planning & Control*, 30(13), 1091-1101.
- Chiarini, A. (2019). Why are manufacturing SMEs cancelling their ISO 9001 certification? Research from Italy. *Production Planning & Control*, 30(8), 639-649.
- Chin, K.-S., Poon, G.K.K., & Pun, K.-F. (2000). The critical maintenance issues of the ISO 9000 system: Hong Kong manufacturing industries perspective. *Work Study*, 49(3), 89-96.
- Clougherty, J.A., & Grajek, M. (2023). Decertification in quality-management standards by incrementally and radically innovative organizations. *Research Policy*, 52, 104647, 1-16.
- Conti, T. (2004). How to conceptually harmonize ISO 9000 certification, levels of excellence recognition and real improvement. *Total Quality Management*, 15(5/6), 665-677.
- Corbett, C., Sancho, M., & Kirsh, D. (2005). The financial impact of ISO 9000 certification in the united states: An empirical analysis. *Management Science*. 51(1), 1046-59.
- Djofack, S., & Camacho, M.A.R. (2017). Implementation of ISO 9001 in the Spanish tourism industry. *International Journal of Quality & Reliability Management*, 34(1), 18-37.
- Esgarrancho, S., & Cândido, C.J.F. (2020). Firm preparation for ISO 9001 certification: The case of the hotel industry in Portugal. *Total Quality Management & Business Excellence*, 31(1), 23-42. <http://dx.doi.org/10.1080/14783363.2017.1404428>
- Fatima, M. (2014). Impact of ISO 9000 on business performance in Pakistan: Implications for quality in developing countries. *Quality Management Journal*, 21(1), 16-24.
- Faul, F., Erdfelder, E., Lang, A.-G., and Buchner, A. (2007). G\*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavioral Research Methods*, 39(2), 176-191.
- Ferreira, L.M.F.R., & Cândido, C.J.F. (2021). Factors influencing firm propensity for ISO 9001 withdrawal: Evidence on decertification tendency and antecedents. *International Journal of Production Economics*, 233, Article 108024. <https://doi.org/10.1016/j.ijpe.2020.108024>
- Fonseca, L., Domingues, P., Nóvoa, H., Simpson, P. and Sá, J.G. (2023). ISO 9001:2015: The view from the conformity assessment community. *Total Quality Management & Business Excellence*, 34(5-6), 558-579.
- Galetto, M., Franceschini, F., & Mastrogiacomo, L. (2017). ISO 9001 certification and corporate performance of Italian companies. *International Journal of Quality & Reliability Management*, 34(2), 231-250.



- Georgiev, E., and Georgiev, S. (2024). Decoupling of a management standard: How decision-makers reinterpret, renegotiate, and modify the adoption of ISO 9001. *Benchmarking: An International Journal*, 31(5), 1402-1425.
- Gerolamo, M., Carpinetti, L., Vitoreli, G., Sordan, J., & Lima, C. (2014). Quality and safety management systems: Joint action for certification of small firms in an industrial cluster in Brazil. *South African Journal of Industrial Engineering August*, 25(1), 189-202.
- Glogovac, M., & Filipovic, J. (2018). Quality costs in practice and an analysis of the factors affecting quality cost management. *Total Quality Management & Business Excellence*, 29(13), 1521-1544.
- Gonçalves, F.M.R.R., Cândido, C.J.F., & Feliciano, I.M.P.L. (2020). Inertia, group conformity and customer loyalty in healthcare in the information age. *Journal of Service Theory and Practice*, 30(3), 307-330. <https://doi.org/10.1108/JSTP-08-2019-0184>
- Hernandez-Vivanco, A., Domingues, P., Sampaio, P., Bernardo, M., & Cruz-Cázares, C. (2019). Do multiple certifications leverage firm performance? A dynamic approach. *International Journal of Production Economics*, 218, 386-399.
- Hernandez-Vivanco, A., & Bernardo, M. (2023). Management systems and productive efficiency along the certification life-cycle. *International Journal of Production Economics*, 266, article 109028.
- Islam, M.M., Habes, E., Karim, A., & Agil, S.O.S (2016). Quality certification and company performance - The newly developed country experience. *Journal of Business Economics and Management*, 17(4), 628-644.
- Ismyrlis, V., & Moschidis, O. (2015). The effects of ISO 9001 certification on the performance of Greek companies. *The TQM Journal*, 27(1), 150-162.
- ISO (2012). *ISO Survey 2011*. Geneva: ISO Central Secretariat.
- ISO (2015a). *ISO Survey 2014*. Geneva: ISO central Secretariat.
- ISO (2015b). *ISO 9001:2015 Quality Management Systems Requirements*. Geneva: ISO.
- ISO (2023). *ISO Survey 2022*. Geneva: ISO central Secretariat.
- Kafel, P., & Nowicki, P. (2014). Functioning of environmental and quality management systems after resignation of management standard certification: Case study of Polish organisations. *International Journal for Quality Research*, 8(4), 505–516.
- Kafel, P., and Simon, A. (2017) The Reasons for Decertification of ISO 9001: Financial Aspects, *Quality Innovation Prosperity*, 21(3), 173-184.
- Kakouris, A.P., & Sfakianaki, E. (2018). Impacts of ISO 9000 on Greek SMEs business performance. *International Journal of Quality & Reliability Management*, 35(10), 2248-2271.
- Kakouris, A.P. and Sfakianaki, E. (2019). Motives for implementing ISO 9000: Does enterprise size matter? *International Journal of Productivity and Performance Management*, 68(2), 447-463.
- Kusumah, L.H., & Fabianto, Y.S. (2018). The differences in the financial performance of manufacturing companies in Indonesia before and after ISO 9000 implementation. *Total Quality Management & Business Excellence*, 29(8), 941-957.
- Lee, V-H., K-B. Ooi, A.S. Sohal, & A.Y-L. Chong. (2012). Structural relationship between TQM practices and learning organisation in Malaysia's manufacturing industry. *Production Planning & Control*, 23(10-11): 885-902.
- Lima, M., Resende, M., & Hasenclever, L. (2000). Quality certification and performance of Brazilian firms: An empirical study. *International Journal Production Economics*, 66(1),



143-147.

- Lindlbauer, I., Schreyögg, J., & Winter, V. (2016). Changes in technical efficiency after quality management certification: A DEA approach using difference-in-difference estimation with genetic matching in the hospital industry. *European Journal of Operational Research*, 250(3), 1026-1036.
- Liu, H., Wu, S., Zhong, C., & Liu, Y. (2021). An empirical exploration of quality management practices and firm performance from Chinese manufacturing industry. *Total Quality Management & Business Excellence*, 32(15), 1694-1712.
- Lo, C.K.Y., & Yeung, A.C.L. (2018). Quality management standards, institutionalization and organizational implications: A longitudinal analysis. *International Journal of Production Economics*, 200, 231-239.
- Lo, L., & Chang, D. (2007). The difference in the perceived benefits between firms that maintain ISO certification and those that do not. *International Journal of Production Research*, 48(1), 1881-97.
- Maletič, D., Almeida, N.M., Gomišček, B., & Maletič, M. (2022). Understanding motives for and barriers to implementing asset management system: An empirical study for engineered physical assets. *Production Planning & Control*, 34(15), 1497-1512.
- Martínez-Costa, M., & Martínez-Lorente, A. (2003). Effects of ISO 9000 certification on firms' performance: A vision from the market. *Total Quality Management & Business Excellence*, 14(10), 1179-1191.
- Martínez-Costa, M., & Martínez-Lorente, A. (2007). A triple analysis of ISO 9000 effects on company performance. *International Journal of Productivity and Performance Management*, 56(5/6), 484-99.
- Martínez-Costa, M., Martínez-Lorente, A., & Choi, T. (2008). Simultaneous consideration of TQM and ISO 9000 on performance and motivation: An empirical study of Spanish companies. *International Journal of Production Economics*, 113(1), 23-39.
- Nair, A., & Prajogo, D. (2009). Internalisation of ISO 9000 standards: The antecedent role of functionalist and institutionalist drivers and performance implications. *International Journal of Production Research*, 47(16), 4545-4568.
- Ochieng, J., Muturi, D., & Njihia, S. N. (2015). The impact of ISO 9001 implementation on organizational performance in Kenya. *The TQM Journal*, 27(6), 761-771.
- Ong, C.M., Kathawala, Y., & Sawalha, N. (2015). A model for ISO 9000 quality management system maintenance. *Quality Management Journal*, 22(2), 11-32.
- Parra-López, C., Hinojosa-Rodríguez, A., Carmona-Torres, C., & Sayadi, S. (2015). ISO 9001 implementation and associated manufacturing and marketing practices in the olive oil industry in southern Spain. *Food Control*, 62(1), 23-31.
- Pekovic, S. (2015). Quality and environmental management practices: Their linkages with safety performance. *Production Planning & Control*, 26(11), 895-909.
- Prajogo, D. (2011). The roles of firms' motives in affecting the outcomes of ISO 9000 adoption. *International Journal of Operations & Production Management*, 31(1), 78-100.
- Psomas, E., & Kafetzopoulos, D. (2014). Performance measures of ISO 9001 certified and non-certified manufacturing companies. *Benchmarking: An International Journal*, 21(5), 756 - 774.
- Psomas, E., Pantouvakis, A., & Kafetzopoulos, D. (2013). The impact of ISO 9001 effectiveness on the performance of service companies. *Managing Service Quality*, 23(1), 149-164.



- Rodriguez-Arnaldo, O., & Martínez-Lorente, A.R. (2021). What determinants influence the diffusion of ISO 9001 by countries? *The TQM Journal*, 33(1), 223-246.
- Saizarbitoria, I., Arana, A., & Boiral, O. (2015). Do ISO 9001 certified hotels get a higher customer rating than non-certified ones? *International Journal of Hospitality Management*, 51(1), 138-146.
- Sampaio, P., Saraiva, P., & Gomes, C. (2014). ISO 9001 European Scoreboard: An instrument to measure macroquality. *Total Quality Management & Business Excellence*, 25(3-4), 309-318.
- Sampaio, P., Saraiva, P., & Monteiro, A. (2012). ISO 9001 certification pay-off: Myth versus reality. *International Journal of Quality & Reliability Management*, 29(8), 891-914.
- Sampaio, P., Saraiva, P., & Rodrigues, A. (2011). The economic impact of quality management systems in Portuguese certified companies: Empirical evidence. *International Journal of Quality & Reliability Management*, 28(1), 929-50.
- Sansalvador, M., & Brotons, J. (2015). Valuation of the option of abandoning ISO 9001 certification: An empirical study in Spain. *Total Quality Management & Business Excellence*, 26(11/12), 1255-1268.
- Sfakianaki, E., & Kakouris, A.P. (2020). Obstacles to ISO 9001 certification in SMEs. *Total Quality Management & Business Excellence*, 31(14), 1544-1564.
- Sfredde, L.S., Vieira, G.B.B., Vidor, G., & Santos, C.H.S. (2021). ISO 9001 based quality management systems and organisational performance: A systematic literature review. *Total Quality Management & Business Excellence*, 32(4), 389-409.
- Siltori, P.F.S., Rampasso, I.S., Martins, V.W.B., Anholon, R., Silva, D., & Pinto, J.S. (2021). Analysis of ISO 9001 certification benefits in Brazilian companies. *Total Quality Management & Business Excellence*, 32(11-12), 1614-1632.
- Simon, A., & Kafel, P. (2018). Reasons for decertification of ISO 9001: An empirical study. *Innovar*, 28(70), 69-80.
- Siougle, E., & Dimelis, S. (2021). Linking ISO 9000 certification to firm performance and financial crisis: A matched sample longitudinal analysis. *International Journal of Quality & Reliability Management*, 38(3), 751-779.
- Siougle, E., Dimelis, S., & Economidou, C. (2019). Does ISO 9000 certification matter for firm performance? A group analysis of Greek listed companies. *International Journal of Production Economics*, 209, 2-11.
- Siougle, E., Dimelis, S. & Malevris, N. (2024). Does personal data protection matter for ISO 9001 certification and firm performance? *International Journal of Productivity and Performance Management*, 73(3), 749-774.
- Sivaram, N., Devadasan, S., & Muruges, R. (2013). Conceptualisation for implementing total productive maintenance through the ISO 9001:2008 standard-based quality management system. *South African Journal of Industrial Engineering*, 24(2), 33-46.
- Soares, J. (2014). Study of the relevance of ISO 9001 standard in the performance of the Portuguese hospitality industry, *Tourism & Management Studies*, 10(2), 57-66.
- Su, H.-C., Dhanorkar, S., & Linderman, K. (2015). A competitive advantage from the implementation timing of ISO management standards. *Journal of Operations Management*, 37, 31-44.
- Sun, X., Wen, D., Yan, D., & Li, Y. (2019). Developing and validating a model of ISO 9001 effectiveness gap: Empirical evidence from China. *Total Quality Management & Business Excellence*, 30(S1), S274-S290.



- Tarí, J.J., Molina-Azorín, J.F., Pereira-Moliner, J., & López-Gamero, M.D. (2020). Internalization of quality management standards: A literature review. *Engineering Management Journal*, 32(1), 46-60.
- Terziovski, M., & Guerrero, J.-L. (2014). ISO 9000 quality system certification and its impact on product and process innovation performance. *International Journal of Production Economics*, 158, 197–207.
- Terziovski, M., Power, D., & Sohal, A. (2003). The longitudinal effects of the ISO 9000 certification process on business performance. *European Journal of Operational Research*, 146(1), 580–595.
- Terziovski, M., Samson, D., & Dow, D. (1997). The business value of quality management systems certification: Evidence from Australia and New Zealand. *Journal of Operations Management*, 15(1), 1-18.
- Tzelepis, D., Tsekouras, K., Skuras, D., & Dimara, E. (2006). The effects of ISO 9001 on firms' productive efficiency. *International Journal of Operations & Production Management*, 26(10), 1146-1165.
- Ullah, B. (2020). Signaling value of quality certification: Financing under asymmetric information. *Journal of Multinational Financial Management*, 55, 100629.
- Vilkas, M., & Vaitkevicius, S. (2013). Typological models of motives and effects of adoption of ISO 9000 series standards. *Engineering Economics*, 24(4), 373-384.
- Wu, S.-I., & Jang, J.-Y. (2014). The impact of ISO certification on consumers' purchase intention. *Total Quality Management & Business Excellence*, 25(4), 412-426.
- Wahid, R., & Corner, J. (2009). Critical success factors and problems in ISO 9000 maintenance. *International Journal of Quality & Reliability Management*, 26(1), 881-93.
- Wahid, R.A., Corner, J., & Tan, P.-L. (2011). ISO 9000 maintenance in service organisations: Tales from two companies. *International Journal of Quality & Reliability Management*, 28(7), 735-757.
- Wiengarten, F., P. Humphreys, G. Onofrei, & B. Fynes. (2017.) The adoption of multiple certification standards: Perceived performance implications of quality, environmental and health & safety certifications. *Production Planning & Control* 28(2): 131-141.
- Yang, M.G., & M. Kang. (2020). An integrated framework of mimetic pressures, quality and environmental management, and firm performances. *Production Planning & Control*, 31(9): 709-722.
- Zeng, S.X., Tian, P., & Tam, C.M. (2007). Overcoming barriers to sustainable implementation of the ISO 9001 System. *Managerial Auditing Journal*, 22(3), 244-254.