

Recovering a lost ISO 9001 certification: what is the economic impact?

Carlos J.F. Cândido, Luís M. Serra Coelho & Rúben M.T. Peixinho

To cite this article: Carlos J.F. Cândido, Luís M. Serra Coelho & Rúben M.T. Peixinho (2026) Recovering a lost ISO 9001 certification: what is the economic impact?, Total Quality Management & Business Excellence, 37:3-4, 296-313, DOI: [10.1080/14783363.2026.2619868](https://doi.org/10.1080/14783363.2026.2619868)

To link to this article: <https://doi.org/10.1080/14783363.2026.2619868>



© 2026 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 23 Jan 2026.



Submit your article to this journal [↗](#)



Article views: 162



View related articles [↗](#)



View Crossmark data [↗](#)

Recovering a lost ISO 9001 certification: what is the economic impact?

Carlos J.F. Cândido ^{a,b}, Luís M. Serra Coelho ^{a,b} and Rúben M.T. Peixinho ^{a,b}

^aFaculdade de Economia, Universidade do Algarve, Faro, Portugal; ^bCEFAGE-UA, Faro, Portugal

ABSTRACT

This study assesses the economic impact of ISO 9001 certification recovery following a medium-term period of withdrawal. Data from the Amadeus database is used to implement an event study that matches a sample of Portuguese companies that recover their ISO 9001 certification after operating a full year without such certification with a set of similar but, non-event, counterpart firms. Results show no statistically significant differences in the economic performance of the two groups of companies as measured by the return-on-assets, return-on-sales, and sales growth ratios. Contrary to the predictions of the current theory, this study suggests that certification recovery under ISO 9001 is neither beneficial nor detrimental to firm performance since such an event has no significant impact on the economic performance of the sample companies. This suggests that the decision to recover a lost certification is economically irrelevant for firms that experienced a one-year lag without being certified. This is one of the first studies to assess the impact of ISO 9001 certification recovery after a period of certification withdrawal, and the first to do so exclusively from a financial perspective. The study contributes to understand why only a small proportion of decertified companies (17%) subsequently recover their certification.

ARTICLE HISTORY

Received 13 October 2025
Accepted 14 January 2026



KEYWORDS

certification recovery;
decertification; event study;
ISO 9001; motivations;
performance; quality
management; recertification

1. Introduction

Research on ISO 9001 certification can be addressed from the certification life cycle stages' perspective: adoption, maintenance, recertification, and withdrawal (Castka, 2018; Cândido, 2024; Delfino et al., 2024). Research focusing on ISO 9001 adoption and its potential benefits is abundant (Castka, 2018; Wahid & Corner, 2009). For instance, it is well-established that companies can adopt such standard for several reasons, some of which are internal (e.g. improving internal processes), and others external (e.g. increasing market share; Boiral & Roy, 2007; Djofack & Camacho, 2017). Moreover, there is evidence that internally motivated companies achieve mostly internal benefits (e.g. process improvements), and that externally motivated companies achieve predominantly external benefits (e.g. market share; Djofack & Camacho, 2017; Martínez-Costa et al., 2008; Prajogo, 2011; Sampaio et al., 2012, 2014; Terziovski & Power, 2007). In general, this literature suggests that ISO 9001 certification has significant positive economic benefits (e.g. Corbett et al., 2005; Siougle et al., 2019; Siougle & Dimelis, 2021), despite some controversy on the financial impact of certification (e.g. Cândido et al., 2021; Dick et al., 2008; Lo & Yeung, 2018). Research has also identified the conditions that favour a most effective implementation of the standard (Boiral & Roy, 2007; Briscoe et al., 2005; Esgarrancho & Cândido, 2020), and the obstacles that impede it (e.g. Sfakianaki & Kakouris, 2020).

In contrast, there is little evidence on what happens after certification (Wahid & Corner, 2009). For instance, we still know very little about the maintenance stage of the ISO 9001 cycle (e.g. Castka, 2018), with the few papers available focusing mostly on the motivations and obstacles of such a phase, and the conditions for its success (e.g. Basir & Davis, 2018; Castka, 2018; Wahid & Corner, 2009). Furthermore, there is also a lack of understanding about the ISO 9001 certification withdrawal event (e.g. Chiarini, 2019) as only a few studies address the rationale of such a managerial decision (e.g. Cândido & Ferreira,

CONTACT Carlos J.F. Cândido  ccandido@ualg.pt  Faculdade de Economia, Edifício 8, Universidade do Algarve, Campus de Gambelas, 8005-139 Faro, Portugal

© 2026 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group
This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

2023). This is surprising since thousands of companies lose their certification every year for reasons related with customers no longer requiring certification, having no expectations of additional benefits from the recertification, adopting alternative quality management systems (QMS) (such as other certifications or total quality management (TQM)), and other reasons (Alič, 2014; Cândido & Ferreira, 2022, 2024; Chiarini, 2019; Simon & Kafel, 2018). Some studies have examined the repercussions of ISO 9001 certification withdrawal (e.g. Alič, 2014), although no consensus has been reached on this issue. Specifically, three studies suggest that decertification leads to a decline in firm performance (Alič, 2014; Kafel & Simon, 2017; Sansalvador & Brotons, 2015), whereas Cândido et al. (2016) and Hernandez-Vivanco and Bernardo (2023) report no significant effect. More recent research indicates that the performance impact of decertification may depend on the underlying motivations for both certification and decertification (Delfino et al., 2024; Ferreira & Cândido, 2021). There is also evidence that many firms losing ISO 9001 certification were already facing financial difficulties prior to decertification (Chiarini, 2019), with several subsequently declaring bankruptcy (Alič, 2014).

Research focusing specifically on ISO 9001 recertification is even scarcer. To date, only four papers have addressed this topic, the most prominent of which (Lindlbauer et al., 2016; Nurcahyo et al., 2020) examining how recurrent recertification events influence organisational efficiency. However, the literature has yet to investigate what happens to the financial-economic performance of firms that lose their ISO 9001 certification and subsequently regain it under the same standard (Hernandez-Vivanco & Bernardo, 2023). This gap is particularly relevant, as thousands of companies face such circumstances every year (Ferreira & Cândido, 2021; ISO, 2015a). Once certification is lost, firms must decide whether to pursue its recovery or to continue operating without it. Consequently, the still-unanswered research question is whether the recovery of ISO 9001 certification, after a period of operating without it, leads to abnormal economic performance. To the best of the authors' knowledge, only one prior study has explored a similar issue (Hernandez-Vivanco & Bernardo, 2023), although the study did not consider the financial impact of the recovery. That research focused on a composite measure of productive efficiency rather than on financial outcomes. In this context, the present study seeks to complement existing knowledge by assessing the economic-financial impact of ISO 9001 certification recovery following a period of certification withdrawal.

In accordance, this paper addresses this gap in the literature by considering a sample of 101 Portuguese companies that experience a one-year gap between two consecutive periods of ISO 9001 certification. Using a standard event study, this research investigates whether these firms exhibit abnormal economic performance in the three-year post-recovery period, as measured by return-on-assets (ROA), return-on-sales (ROS) and sales growth, when compared to similar non-event companies. Portugal provides an interesting setting for this research since a substantial number of companies in the country lose their certification every year (Cândido et al., 2016, 2021; ISO, 2015a), with around 17% recertifying afterwards, according to the Institute of Portuguese Accreditation and Certification (IPAC) database.

2. Literature review and hypothesis

2.1. Research on ISO 9001 and the economic-financial impact of certification

ISO 9001 is a standard for quality management systems that was developed to promote international trade by signalling the presence of a certified QMS, reducing information asymmetry between transaction parties, improving coordination between them, lowering transaction costs, and promoting business development across the globe (Blind et al., 2018; Boiral and Roy, 2007; Clougherty and Grajek, 2014; Evans and Lindsay, 2014; Ullah, 2020). ISO 9001 certification ensures that the certified company possesses a QMS that matches the principles of quality management, including, quality strategy orientation, focus on customers, measurement-based management, personnel involvement, and a continuous process of improvement (Guo et al., 2020; ISO, 2012a; Latan et al., 2020).

Despite some controversy on the positive impact of certification on economic-financial performance (e.g. Dick et al., 2008; Lo and Yeung, 2018), most of the extant research suggests significant positive benefits from certification (Hernandez-Vivanco and Bernardo, 2023). For reviews see Cândido et al. (2016), Hernandez-Vivanco et al. (2019) or Siougle et al. (2019). Table 1 constitutes an update to these reviews. As can be seen, most of the recent studies continue to suggest a positive relationship between ISO 9001 certification and

Table 1. Recent research on the economic-financial impact of ISO 9001 (2015–2025).

Study	Result/Conclusion
Kim et al. (2015) Sansalvador and Brotons (2015) Aba et al. (2016)*	Significant impact on processes which in turn significantly impact on economic-financial performance. ISO 9001 certification increases the value of most of the companies in the engineering and environmental sector. Significant improvement in economic performance ‘from prior year to year of certification’. Certified firms perform better than non-certified firms. The benefits lasted for the whole period of the study (five years) and started before certification, due to the firm preparations for certification.
Du et al. (2016) Islam et al. (2016)	Significant positive impact of ISO 9001 on economic-financial performance. Quality, competitiveness, employees, and management performance mediate the relationship between ISO certification and economic performance.
Galetto et al. (2017) Kakouris and Sfakianaki (2018) Kusumah and Fabianto (2018)*	Economic performance is not related to the presence of a QMS certified according to ISO 9001. In four case studies three of the companies reported indirect and intangible financial benefits, and one firm reported no financial benefits at all. Companies that implement ISO 9001 with commitment and consistency show significant impact in financial performance. Without commitment and consistency there is no impact.
Lo and Yeung (2018) Hernandez-Vivanco et al. (2019)*	Significant negative impact on shareholders’ value (measured by Tobin’s <i>q</i>) Significant positive impact of certification on ROCE, ROA, and ROS. Companies must practice and interiorize the philosophy embedded in the standards. The positive impact on performance lasts several years (eight years, <i>i.e.</i> the period analysed in the study).
Siougle et al. (2019)*	Significant positive effect of certification on ROE, ROA, PM and ATO. The effect lasts several years: ROE, six years, ROA, nine years (the longest period analysed in the study).
Latan et al. (2020) Ullah (2020)	The extent of continuous innovation in ISO 9001 certified firms has a significant positive relation with economic-financial performance. Certification has a crucial role in improving firms’ access to external finance which allows them to ‘grow faster and perform better than similar uncertified firms’.
Cândido et al. (2021)* Liu et al. (2021)*	Significant positive impact on ROS, but no significant impact on ROA, and a significant negative effect in sales growth. Significant improvements in ROA and ROS attributed to decrease in cost of sales and operating expenses. The effect on ROA lasted 3 years and the effect on ROS, 4 years. In the fifth year there was a significant reduction in COGS/Sales. Sales growth did not improve.
Mekić and Dinc (2021) Sfредdo et al. (2021) Siougle and Dimelis (2021)*	Significant positive effect of ISO 9001 effectiveness on financial performance. Organizational learning mediates the relationship. The relationship between ISO 9001 and economic-financial performance tends to be positive. Significant higher financial performance of certified firms vs. matched non-certified firms that persist for several years (four to six years post-certification), even during the 2008–2012 crisis.
Vetchagool et al. (2021) Kiryanto et al. (2022)	Significant positive impact of the degree of implementation of ISO 9001 in economic performance in firms that have ABC. No impact in certified firms without ABC. Significant positive impact of the ISO 9001 certification announcement on firm capital market value in the day after the announcement.
Kriemadis et al. (2022) Yu and Xiao (2023)*	The higher the level of quality management implement, the higher the improvement in its financial performance and the lower the probability of bankruptcy. Certification has a positive influence on the amount of funding obtained in crowdfunding and in the probability of reaching the funding goal.
Dočekalová et al. (2024)* Neves et al. (2024)*	The study found no significant direct impact of ISO 9001 certification on economic performance in the European mature and highly regulated markets. ISO 9001 certification has a negative impact on MgEBITDA and has no significant impact on other financial indicators, such as ROA, ROE or Tobin’s Q.
Ronalter et al. (2024)* Uşar (2024)* Wayoro et al. (2025)*	There is no significant impact of ISO 9001 certification on ROE or dividend per share yield, except in case of multiple certifications, where ISO 9001 is combined with other certifications. ‘The impact of ISO 9001 certification on ROA and Tobin’s Q is significant and positive in all model specifications’ ISO 9001:2015 certification increases firms’ performance (measured as total sales) by 48.3%.

Notes: This table updates similar summary tables in Cândido et al. (2016), Hernandez-Vivanco et al. (2019) or Siougle et al. (2019). * Longitudinal study. ABC, activity-based costing; ATO, assets turnover ratio; COGS, cost of goods sold; MgEBITDA, earnings before interest, taxes, depreciation, and amortization margin; PM, profit margin ratio; ROA, return on assets; ROCE, return on capital employed; ROE, return on equity.

firm economic-financial performance. Most longitudinal studies in the table (8/13 = 62%) also suggest that certification benefits are significant, positive, and can last for several years (Aba et al., 2016; Hernandez-Vivanco et al., 2019; Liu et al., 2021; Siougle et al., 2019; Siougle & Dimelis, 2021; Wayoro et al., 2025).

The lack of complete agreement on the impact of certification can be due to the exclusion of contingency factors in some of the extant research (Lo et al., 2013; Wiengarten et al., 2017). Thus, researchers have identified the conditions that favour the most effective implementation of the ISO 9001 standard (Boiral & Roy, 2007; Briscoe et al., 2005; Esgarrancho & Cândido, 2020; Lo et al., 2013; Naveh & Marcus, 2005; Tarí et al., 2020, 2022; Wiengarten et al., 2017) and the obstacles that impede it (e.g. Carvalho & Medeiros, 2022; Cândido & Santos, 2011, 2015; Sfakianaki & Kakouris, 2020; Sroufe & Curkovic, 2008). Some of the most important preconditions for success are top management commitment, receptive culture, a plan for the implementation of ISO 9001 tailored to the organization (Cai & Jun, 2018; Esgarrancho & Cândido, 2020; Liu et al., 2021; Tarí et al., 2020) and strong motivations for the adoption of ISO 9001 (Psomas &

Antony, 2015; Sun et al., 2019). Internally motivated organizations are more committed and tend to internalize the standard, thus face smaller implementation obstacles, and achieve higher benefits than externally motivated organisations (Boiral & Roy, 2007; Djofack & Camacho, 2017;; Martínez-Costa et al., 2008; Prajogo, 2011; Saboya et al., 2025; Sampaio et al., 2012, 2014 Sun et al., 2019; Terziovski & Power, 2007).

2.2. Research on ISO 9001 decertification

Despite the calls for research on decertification (e.g. McGuire & Dilts, 2008), papers on ISO 9001 withdrawal are still scarce (Camango & Cândido, 2023). This branch of investigation addresses two main issues: (1) the motivations for decertification and (2) the organisational consequences of decertification. The first topic has identified several reasons that may lead firms to decertify. For instance, Lo and Chang (2007) and Kafel and Nowicki (2014) highlight that the costs of the recertification process play an important role in this decision, with Alič (2014) indicating that an inadequate implementation of the standard is also very important. Sansalvador and Brotons (2015) claim that firms decertify when they experience lower-than-expected certification benefits. Cândido et al. (2016, 2021) note that the benefits from the ISO 9001 certification may have already been internalised in the company processes, which would reduce the interest in recertifying. In contrast, Simon and Kafel (2018) stress that many companies may already be in a difficult economic-financial situation before decertifying, while Chiarini (2019) emphasises that, in many cases, the loss of ISO 9001 certification is due to customers no longer demanding such certification. These and other decertification motivations are summarised in Table 2, along with other results from the existing studies.

The other main topic of research on ISO 9001 decertification is the consequences of the withdrawal. There are only six studies exploring this issue, and their conclusions are even more controversial than the research on decertification motivations. Three studies suggest that decertification can have negative consequences for the organisation, such as lower financial performance, liquidation, bankruptcy (Alič, 2014; Kafel and Simon, 2017) and the reduction of company value (Sansalvador and Brotons, 2015). Two other studies, however, conclude that ISO 9001 decertification does not lead to any statistically significant impact on firm's economic performance (Cândido et al., 2016; Hernandez-Vivanco and Bernardo, 2023). Delfino et al. (2024) provide additional evidence supporting the absence of impact for most companies, although those with stronger external motivations for certification may experience negative effects. Ferreira and Cândido (2021) further contribute empirical evidence that helps explain this contradiction in the literature by linking it to the underlying motivations for both certification and decertification, as well as to the composition of study samples.

2.3. Distinguishing continuous certification from certification recovery

Research on ISO 9001 certification is extensive and well established, particularly regarding initial adoption and the benefits of certification. In contrast, research on the subsequent stages of the certification cycle – namely, maintenance, decertification, and recovery – remains comparatively incipient. This distinction is theoretically important because continuous certification and certification recovery constitute different organisational pathways with distinct implications for internalization, continuous improvement, organisational learning and legitimacy.

A clear distinction can be drawn between certification recovery and continuous certification in terms of internalisation, learning and legitimacy. Firms that maintain uninterrupted certification typically follow a stable trajectory of incremental learning, supported by the ongoing internalisation of ISO 9001 practices. By contrast, empirical evidence shows that firms undergoing decertification frequently abandon essential elements of their QMS, such as internal audits, corrective actions, and preventive actions (continuous improvement; Kafel and Nowicki, 2014). These practices, together with the associated internalisation and learning processes, are therefore interrupted during the decertified period but must be reinstated for certification recovery to occur. The legitimacy implications also differ: continuous certification preserves a consistent external perception of reliability and conformity, whereas recovery requires organisations to restore legitimacy that may have weakened during decertification. Accordingly, certification recovery constitutes a distinct organisational pathway, rather than merely a continuation of prior certification status.

Table 2. Research on ISO 9001 withdrawal.

Study	Result/Conclusion
Lo and Chang (2007)	Identifies decertification motivations (time, cost, workload, ISO 9001 being merely a minimum requirement, low benefits, competitors already certified). Does not address the repercussions of decertification.
Alič (2014)	Identifies decertification motivations (effects of inadequate implementation, low attractiveness) and the negative consequences of decertification (decline in business performance, survival difficulties, liquidation, bankruptcy). Suggests that many organisations were already 'in trouble before taking the decision to give up certification' and that a cancelled certificate can be considered an early warning of future business performance decline.
Kafel and Nowicki (2014)	Identifies decertification motivations (cost, low benefits, certification not demanded by customers) and repercussions of decertification (the QMS, or part of it, continues to operate without certification).
Sansalvador and Brotons (2015)	Offers a method to determine the value of a real option to abandon the certification. Identifies motives for decertification (low benefits, savings from decertification, no internalisation of ISO 9001). The consequence of certification withdrawal is a reduction in company value.
Cândido et al. (2016)	Decertification has no significant impact on firm economic-financial performance (there is no decertification repercussion). Identifies motives for decertification (standard already internalized, cost, company does not expect to pass the audit).
Kafel and Simon (2017)	Concludes that decertification has a negative impact on firm performance and that there is a relationship between the type of motivation for decertification and the economic-financial performance after the withdrawal.
Simon and Kafel (2018)	Identifies decertification motivations (company in financial distress, no competitive advantage from ISO 9001 registration, cost, certification not demanded by customers, alternative standards or QMS available, new version of the standard, lack of time). Suggests a classification of motivations in internal and external. Does not address the repercussions of decertification.
Chiarini (2019)	Identifies decertification motives (customers not interested in certification, low benefits, lack of management commitment, cost) and statistically tests their validity. Proposes a model of the relationships between motivations (that remains to be tested). Does not address the repercussions of decertification.
Cândido et al. (2021)	Finds that low economic performance is <i>not</i> a reason why companies decertify. Suggests other motives for decertification (standard already internalized, certification is not rare not inimitable resource). Does not address the repercussions of decertification.
Ferreira and Cândido (2021)	Develops a comprehensive model of decertification propensity and its antecedents. Develops a measurement tool for the model constructs. Concludes that to understand decertification, the aspects related to pre-certification, certification, decertification, and post-decertification must be considered together. Introduces the concept of expected performance after decertification (EPAD).
Cândido and Ferreira (2022)	Develops a model of the antecedents of EPAD. Suggests that EPAD is a better predictor of decertification than past certification benefits. The main factors affecting EPAD are external decertification motivations and internal certification benefits. Internal benefits have a U-shaped relationship with EPAD and external decertification motivations a positive linear relationship.
Camango and Cândido (2023)	Presents a systematic literature review that develops a model of certification maintenance, decertification and recertification and identifies several recommendations for future research.
Cândido and Ferreira (2023)	Develops a model of the antecedents of internal decertification motivations. The main antecedents are external decertification motivations and external certification barriers. External barriers do not disappear after certification and are a much stronger antecedent of internal decertification motivations than low benefits. Internal barriers are not an antecedent. Does not address the consequences of decertification.
Clougherty and Grajek (2023)	Addresses the relationship between innovation and decertification, concluding that the incrementally-innovate organisations are less prone to lose their quality management certification than the radically-innovative organisations. Radical innovation is, thus, a driver (motivation for) decertification.
Hernandez-Vivanco and Bernardo (2023)	ISO 9001 decertification alone does not produce any statistically significant impact on a firm's productive efficiency; however, the simultaneous withdrawal of ISO 9001 and ISO 14001 certifications results in a negative effect.
Cândido (2024)	Develops a 'framework of the alternative strategies for the stages of the ISO 9001 life cycle: implementation/certification, certification maintenance, and recertification/decertification stages'.
Delfino et al. (2024)	Decertification originates in the pre-certification stage, when firms prioritise external over internal motivations, and continues in the maintenance stage, where they fail to internalize the standard and to sustain continuous improvement. This, combined with limited benefits, leads to certification withdrawal. Most firms report no performance impact after decertification, though those driven by stronger external motivations may experience negative effects.
Jacob et al. (2025)	Decertification in Botswana is high, with a 55% termination rate over two decades, mainly driven by managerial shortcomings, financial constraints, and weak process management, particularly affecting micro and small enterprises that often lose certification within two years.

Note: Podrecca et al. (2025) not included in the table because their study on decertification does not separate ISO 9001 from non-quality management standards.

Recognising this distinction is important for framing the contribution of the present study, as the literature on recertification to date has focused almost exclusively on organisations that continuously maintain their certified status.

2.4. Research on ISO 9001 recertification

Research specifically and purposefully addressing ISO 9001 recertification is even scarcer than studies on decertification. Only four studies appear to explore this issue, all focusing on organisations that

continuously recertify under this standard (without any period of withdrawal). In particular, Lindlbauer et al. (2016) resort to data envelopment analysis (DEA) to investigate how this type of recertification impacts the efficiency of German hospitals. Interestingly, the authors conclude that both ISO 9001 certification and recertification have a significant negative impact on hospital efficiency but speculate that such events may have a positive effect on quality improvement.

The second paper on this topic is that by Nurcahyo et al. (2020), who employ DEA to examine the impact of a continuous recertification effort on the efficiency of Indonesian public health care centres. They arrive at three main conclusions: (1) there is significant variation in efficiency among centres, (2) only 23 percent of the centres are efficient, and (3) the number of recertifications does *not* have a significant impact on efficiency. Nurcahyo et al. (2020) stress that their conclusions are surprising since recertification should allow organisations to continuously improve their processes and, consequently, it should have a positive impact on efficiency.

The third paper, Lando et al. (2024), uses partial least squares structural equation modelling (PLS-SEM) to analyse the relationship between certification body service quality and recertification intentions. The findings show that service quality does not directly affect recertification intentions but exerts an indirect influence through relationship commitment.

Lastly, Camango and Cândido (2023) present a systematic literature review of ISO 9001 maintenance, decertification and recertification to develop a comprehensive model based on this literature and offer recommendations for future research.

2.5. Hypothesis definition

A careful analysis of the literature reveals five basic pillars that are instrumental in the definition of the research hypothesis analysed in this study. The first pillar is that ISO 9001 has a positive and significant effect on firms' performance. Although causality has not been proven – due to methodological limitations and the combined effects of several contextual factors – both the quality management theory and most of the empirical studies continue to support the idea of a positive effect of certification. Simmons and White (1999) is probably the first paper providing empirical support to this result, which was followed by many others that present very similar conclusions (e.g. Aba et al., 2016; Benner and Veloso, 2008; Corbett et al., 2005; Hernandez-Vivanco et al., 2019; Liu et al., 2021; Siougle et al., 2019; Siougle & Dimelis, 2021).

The second pillar is the finding that the impact of certification on performance endures over long periods and/or accrues over time, with most longitudinal studies corroborating this view (e.g. Aba et al., 2016; Benner & Veloso, 2008; Corbett et al., 2005; Häversjö, 2000; Heras et al., 2002; Hernandez-Vivanco et al., 2019; Liu et al., 2021; Siougle et al., 2019; Siougle & Dimelis, 2021). Such long-term effect can result from continuous improvement and gradual internalisation of the standard in the firms' processes. It can also be driven by the development of a quality culture in the organisation (Tari et al., 2020), which can take as long as a decade to sink in deeply (Kotter, 2007). It might also come from an evolution of the certification motivations since, over time, companies may move from purely external ones, as their culture changes, to internal motivations (Cândido, 2024; Saboya et al., 2025; Tari et al., 2020).

The third pillar underpinning this paper's research hypothesis is that formal ISO 9001 certification helps maximize the benefits arising from the standard. In fact, although formal registration is not mandatory, ISO (2012b) argues that not doing so is a sub-optimal choice as the benefits from the standard are usually higher for companies that seek formal certification from an accredited body (ISO, 2012b). This is especially clear when customers demand such type of certification (Laskurain-Iturbe et al., 2021), and when the certification entity provides adequate feedback to improve firms' processes (Castka, 2018). Thus, certification by a third party can enhance external relationships, the ability to secure resources, to improve, to be profitable and to survive (Miller et al., 2018). This notwithstanding, the scant empirical evidence suggests that certified and similar non-registered implementers tend to exhibit similar benefits from the adoption of the ISO 9001 standard (Karapetrovic et al., 2010; Sila, 2007; Siltori et al., 2021; Wilson & Campbell, 2016).

The fourth pillar concerns the fact that (some) certified firms experience a decline in performance following the loss of certification. According to Ferreira and Cândido (2021) and Delfino et al. (2024), a proportion of firms may indeed face negative performance impacts after decertification. Earlier studies also reached similar conclusions, indicating that decertified firms tend to suffer adverse performance effects

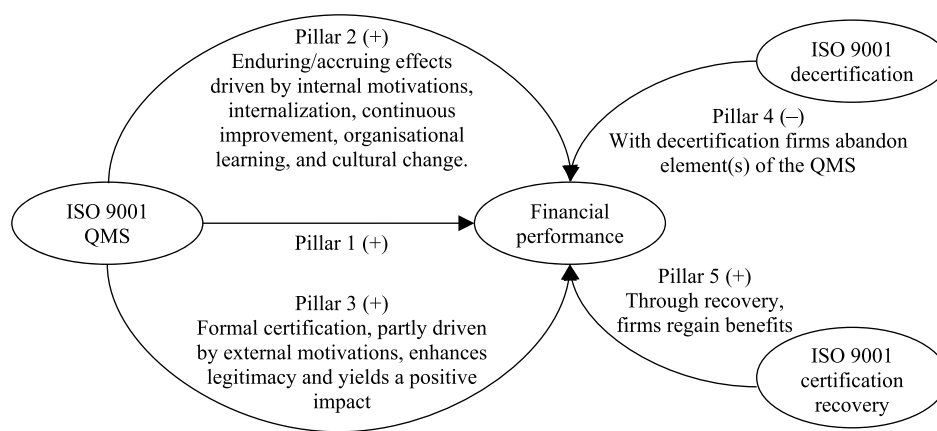


Figure 1. The five pillars and the research hypothesis.

(Alič, 2014; Kafel & Simon, 2017; Sansalvador & Brotons, 2015). Firms that lose certification often abandon parts of their QMS (Kafel & Nowicki, 2014), which consequently ceases to contribute effectively to process management. This deterioration negatively affects product quality, customer satisfaction, and ultimately, economic performance. In line with this reasoning, the abandonment of QMS elements implies non-compliance with key requirements of the ISO 9001 standard, further reinforcing the likelihood of negative performance outcomes from decertification.

The fifth and last instrumental pillar of this study is that firms may recover their certification following a period without certification. Many reasons justify why companies withdraw from ISO 9001 (e.g. Chiarini, 2019). For instance, customers might stop demanding certification (Chiarini, 2019), companies may face financial distress (Simon & Kafel, 2018) or be unable to resolve non-conformances in the period granted for doing so by the external auditor. However, if circumstances change over time, decertified firms may decide to recover their certified status. In particular, because, decertified firms can have a negative impact on performance. Importantly, there is nothing in the ISO 9001 standard precluding a company from recovering a lost ISO certificate (ISO, 2015b). As such, companies that did not fully internalize the standard (*i.e.* suffered from nonconformities), that want to improve their financial situation, or whose customers start demanding the certification can take action to recertify under the ISO 9001 standard.

Taken together, these five pillars provide the theoretical foundation for the conjecture that a company recovering its ISO 9001 certification after operating for a period without it may experience an improvement in its post-event economic performance (Figure 1). The existing literature indicates that certification has a positive and significant effect on firm performance (Pillar 1), that this effect endures and accrues over time (Pillar 2), and that formal certification (rather than merely following the requirements without pursuing formal recognition) yields greater benefits (Pillar 3). Conversely, economic-financial performance tends to decline when certification is lost (Pillar 4), while nothing prevents a company from recovering a lost certification (Pillar 5). Accordingly, the research hypothesis of this paper is as follows:

H1: Firms that recover their ISO 9001 certification after operating a full year without being certified under this standard (event) exhibit abnormal economic performance in the post-event period when compared to similar firms that do not undergo the same event.

3. Methodology

3.1. Data

This paper focus on firms operating in Portugal to analyse the hypothesis developed in the previous section. Two data sources are used to build the initial dataset: (1) the Institute of Portuguese Accreditation and Certification (IPAC) database, which contains the list of all ISO 9001 certified organisations in Portugal, and (2) the AMADEUS database, which contains historical accounting data for around 21 million European firms. Merging these two datasets is challenging, given the size of the databases and the fact that the only common

Table 3. Defining the sample of recertifying firms.

	Frequency
ISO 9001 certified firms in Portugal, in the 2011–2018 period, according to IPAC, and present in the AMADEUS database	8 476
Recovering firms (subsample of companies that lose their certification for one year and subsequently recover the certified status in the following year)	129
Firms with insufficient data on AMADEUS	28
Final sample	101

variable is the firms' name. Hence, a special programme had to be developed to help with the harmonization and integration of the databases.

As shown in Table 3, this paper initially identifies a total of 8,476 Portuguese companies that are on file on AMADEUS and, according to IPAC, are ISO 9001 certified at least once in the 2011–2018 period. This study then looks for the firms that lose their certification and immediately recertify in the following year, keeping the certified status for the usual three-year period. This step eliminates 8,347 cases. A further 28 companies are excluded because they lack the accounting data required for this study. In the end, this paper's final sample encompasses 101 firms that recover their ISO 9001 certification after a one-year period of withdrawal and subsequently keep the recovered certification for three years.

3.2. Event study methodology

This paper explores its research hypothesis using the event study methodology proposed by Barber and Lyon (1996). The event of interest is the certification recovery of the sample firms that, by convention, occurs in year t . The paper tracks such companies' abnormal performance over the customary three-year certification period (*i.e.* years t , $t + 1$, and $t + 2$). Drawing on Barber and Lyon (1996), return-on-assets (ROA) is the main operating performance measure, defined as the ratio of earnings before interest and taxes (EBIT) to the average book value of total assets. Following Cândido et al. (2016, 2021), and for robustness purposes, this paper also employs two additional measures of operating performance. The first is the return-on-sales (ROS), defined as the ratio of EBIT to total operating revenue; the second is the rate of growth in sales, defined as $(\text{Operating revenue } t - \text{Operating revenue } t-1) / \text{Operating revenue } t-1$.

Drawing on Barber and Lyon (1996), this paper employs the following change model to proxy for the sample firms' expected performance:

$$E(P_{i,t,l}) = P_{i,t} + (PI_{i,t+l} - PI_{i,t}) \quad (1)$$

where $E(P_{i,t,l})$ is the expected performance of sample firm i in any period $t + l$ using period t as the base period, $P_{i,t}$ is the actual performance of firm i in time t and $PI_{i,t}$ is the performance of the control group in year t . Barber and Lyon (1996) show that change models that account for size and pre-event performance yield well-specified test statistics in all situations they consider. Hence, this paper defines the control group as follows. First, for each sample firm i , a set of potential control candidates is determined based on size. Potential candidates must be on record on the AMADEUS database, and their book value of assets in year $t-2$ must lie between 70% and 130% of that of the sample firm in the same year. The second step eliminates all the candidates with a ROA in year $t-2$ that falls outside a 10% margin relative to the ROA of the sample firm i they are paired with. The final step deletes all control companies that do not have the required accounting data available on years $t + 1$ and $t + 2$ as Barber and Lyon (1996: 377) recommend holding the matching firm portfolio constant over time. This procedure matches a variable number of companies to each sample firm i . Drawing on Barber and Lyon (1996: 369), when appropriate, this paper employs medians as proxy for the performance of the control group in year t .

The abnormal performance of sample firm i in any period $t + l$ using period t as the base period is then estimated as follows:

$$AP_{i,t,l} = P_{i,t+l} - E(P_{i,t,l}) \quad (2)$$

where $P_{i,t+l}$ is the actual performance of firm i in time $t + l$, and $E(P_{i,t,l})$ is given by equation (1). Next, this paper tests whether the abnormal performance is significantly different from zero. Barber and Lyon (1996) suggest that nonparametric tests are more robust than parametric t-tests. When the distribution is

symmetric, the Wilcoxon signed rank (WSR) test is suitable. This is not the case when the distribution is highly skewed. In this setting, the sign test is more appropriate. This paper employs both tests and, for completeness, also reports parallel results using t-tests. Statistical computations are performed with the SAS software.

4. Results

4.1. Summary statistics

The sample firms compete in 31 different economic sectors, defined here per the companies' two-digit SIC code. A significant proportion (16 firms, 15.8% of total) are health service firms (SIC code 8049-8099) and manufacturing companies (9 firms, 8.9% of total, with SIC code 3423-3499). No additional industry concentration affects this paper's final sample.

Table 4 presents summary statistics for the sample firms, with all figures computed in the recertification year, t . For comparison reasons, parallel statics are also provided by a matching population of Portuguese firms present in the AMADEUS database. This set of firms includes all the companies that compete in the same two-digit SIC code industry as the sample firms in the calendar year of interest.¹ Importantly, all the variables reported in Table 4 are winsorized at the first and the 99th percentiles to minimize the influence of extreme outliers.

As can be seen, the sample firms are significantly larger (as measured by the book value of assets) than the AMADEUS companies considered in Table 4. This result holds irrespective of using the t or the Wilcoxon–Mann–Whitney test for the difference in means and medians, respectively. Furthermore, there is clear evidence that the sample firms are less liquid (mean difference in LIQ = -7.2 ; median difference = -0.4 , both significant at better than 1%) and more exposed to the risk of failure (mean difference in INCOV = 0.08 , median difference = 0.09 , both significant at better than 1%) than the AMADEUS database companies. Results for ROA and leverage are less clear. In fact, when considering means, Table 4 suggests that the sample firms are not as levered and are more profitable than their AMADEUS counterparts, with the t-test for difference in means significant at better than 1% for these two variables. Yet, the parallel differences in medians are not statistically significant even at 10%.

4.2. Event-study

Table 5 summarizes this paper's main findings. To help clarify the results, consider the first line of Panel A, where performance is measured using ROA and the base year of the change model is that preceding the certification recovery year. As can be seen, the mean abnormal performance of the sample firms is 0.7%, which indicates that their actual performance *exceeds* what one could reasonably expect in the absence of the ISO recertification event. However, the p -value of the t-test is *not* statistically significant even at 10%, a conclusion that holds when one considers the parallel non-parametric evidence. In particular, the median abnormal performance is again positive (0.1%) but the Wilcoxon signed-rank test (*i.e.* this paper's main statistical test) and the sign test are not significant at 10%. Together, these results suggest that the certification recovery event does *not* lead the sample firms to experience any abnormal performance (as measured by ROA) in the period under analysis. The full range of results summarized in Panel A of

Table 4. Summary statistics.

Variable	Sample Firms		Amadeus Population		Diff. (Sample-Population)	
	Mean	Median	Mean	Median	Mean	Median
TA (€m)	8.0	2.7	0.9	0.2	7.1***	2.5***
LEV	25.0%	25.9%	29.8%	16.8%	-4.8%***	9.1%
LIQ	2.1	1.5	9.3	2.0	-7.2***	-0.4***
INCOV	0.18	0.13	0.09	0.04	0.08***	0.09***
ROA	5.7%	4.7%	0.6%	3.3%	5.2%***	1.4%

Notes: *** significant at the 1%, ** significant at the 5%, * significant at the 10% level. TA: total assets, in €m. LEV: leverage proxy (total debt/total assets). LIQ: liquidity proxy (current assets/current liabilities). INCOV: bankruptcy risk proxy (interest expense/EBITDA). ROA: return on assets (EBIT/total assets).

Table 5. Abnormal performance, matching by SIZE and ROA.

Event period	AP Mean	AP Median	Skewed	p-value (t-test)	p-value (sign test)	p-value (WSR test)
Panel A: operating performance is measured by ROA						
t-1 to t	0.7%	0.1%	Y	0.30	1.00	0.51
t-1 to t+1	1.8%	-0.1%	Y	0.06	1.00	0.27
t-1 to t+2	1.0%	0.6%	N	0.35	0.32	0.16
t to t+1	1.1%	0.2%	N	0.13	0.69	0.13
t to t+2	0.3%	0.4%	Y	0.74	0.55	0.33
Panel B: operating performance is measured by ROS						
t-1 to t	-2.2%	-0.3%	Y	0.42	0.69	0.78
t-1 to t+1	-3.0%	-0.5%	Y	0.51	0.43	0.95
t-1 to t+2	-3.9%	-0.3%	Y	0.41	0.84	0.83
t to t+1	-0.8%	0.1%	Y	0.68	0.84	0.30
t to t+2	-1.7%	0.1%	Y	0.46	0.84	0.43
Panel C: operating performance is measured by growth in sales						
t-1 to t	6.5%	1.3%	Y	0.21	0.69	0.25
t-1 to t+1	-6.9%	0.1%	Y	0.50	1.00	0.93
t-1 to t+2	3.1%	1.7%	Y	0.26	0.69	0.34
t to t+1	-13.5%	-2.6%	Y	0.13	0.16	0.10
t to t+2	-3.4%	-1.9%	Y	0.51	0.69	0.37

Table 5 leads essentially to the same conclusion since all but one of the reported *t*, Wilcoxon signed-rank, and sign tests are not statistically significant at 10%.²

Panels B and C of Table 5 summarize the results for the ROS and growth in sales performance measures, respectively. As can be seen, *none* of the reported parametric and non-parametric tests are statistically significant at 10%. Hence, this paper's main conclusion does not change when one uses these alternative performance measures, *i.e.* post-event, Portuguese companies that recover the ISO 9001 certification status *fail* to experience a significant abnormal performance (as measured by ROS or the rate of growth in sales) when compared to firms sharing similar size and pre-event performance. This conclusion holds for all the event periods and base years considered in the analysis, which leads to the rejection of this paper's research hypothesis.

4.3. Robustness

It is important to investigate whether this paper's main conclusion is robust to sensible methodological changes. Hence, following Barber and Lyon (1996), control firms are redefined, and the matching process is now based on industry (2-digit SIC code) and pre-event performance (as measured by ROA). According to the authors, such alternative set-up is useful in samples of larger firms, which seem to be the case in this research (see summary statistics in Table 4). In practice, control firms are defined as follows. First, match candidates must compete in the same 2-digit SIC code industry as their paired sample firm two years before the certification recovery year. Second, the ROA of the match firm must lie within the 90% to 110% interval of the ROA of the sample firm in the same period. Finally, all candidates that do not have the required accounting data on AMADEUS for years $t + 1$ and $t + 2$ are deleted. Medians are again used to proxy for the performance of the control group in year t .

Table 6 summarizes the results of this robustness test. As can be seen, ROA, ROS and growth in sales are employed as performance measures, and the test covers the same event periods as this paper's main test.

The evidence in Table 6 is very similar to that presented above. In particular, *none* of the Wilcoxon signed-rank tests, sign tests or *t*-tests is statistically significant at 10%. This conclusion holds for all the performance measures considered in this study (*i.e.* ROA, ROS and growth in sales) and event periods covered in the analysis. Hence, changing the control firms does not modify the main conclusion presented above. To be precise, this paper again finds that, in the post-recovery period, the sample firms do not exhibit any abnormal performance relative to their industry and pre-event performance peers, which again leads to the rejection of this paper's research hypothesis.

5. Discussion, implications, and limitations

Previous research shows that approximately 18% of firms lose their ISO 9001 status once their certification period is up (Ferreira & Cândido, 2021; ISO, 2015a). Furthermore, there is evidence that, in Portugal, only

Table 6. Abnormal Performance, matching by SIC code and ROA.

Event period	AP Mean	AP Median	Skewed	p-value (t-test)	p-value (sign test)	p-value (WSR test)
Panel A: operating performance is measured by ROA						
t-1 to t	0,8%	-0,1%	Y	0,22	1,00	0,77
t-1 to t+1	1,4%	-0,1%	Y	0,15	0,84	0,60
t-1 to t+2	0,9%	0,5%	Y	0,38	0,23	0,32
t to t+1	0,6%	0,2%	N	0,41	0,43	0,53
t to t+2	0,1%	0,5%	Y	0,90	0,43	0,55
Panel B: operating performance is measured by ROS						
t-1 to t	0,2%	-0,6%	Y	0,78	0,32	0,41
t-1 to t+1	1,1%	-0,3%	Y	0,34	0,55	0,97
t-1 to t+2	0,7%	0,6%	Y	0,69	0,43	0,32
t to t+1	0,9%	0,3%	N	0,25	0,84	0,44
t to t+2	0,5%	0,4%	Y	0,74	0,43	0,14
Panel C: operating performance is measured by growth in sales						
t-1 to t	7,8%	1,8%	Y	0,10	0,84	0,28
t-1 to t+1	2,1%	-2,5%	Y	0,53	0,55	0,87
t-1 to t+2	1,9%	0,5%	Y	0,48	0,84	0,55
t to t+1	-5,7%	-1,5%	Y	0,22	0,55	0,18
t to t+2	-5,9%	-1,4%	Y	0,19	0,55	0,35

17% of the organisations that end up losing such status regain it in a subsequent period. This low percentage of lost certification recovery is difficult to reconcile with two broadly supported findings in the ISO 9001 literature. The first is that ISO certification tends to significantly improve organisational performance (Pillar 1), with the benefits lasting or accruing over long periods of time (Pillar 2; e.g. Corbett et al., 2005; Siougle et al., 2019; Siougle & Dimelis, 2021). The second is that the benefits from the ISO 9001 standard are higher when firms formally register with an accredited certification body (Pillar 3; ISO, 2012b). Combined with the fact that companies can recover their certification at any time (Pillar 5), and that their performance might decline if they do not (Pillar 4), the existing literature suggests that decertified firms have a strong incentive to recover their ISO 9001 status in the future.

This paper's results, however, do not support this view. Using a carefully designed event-study, this paper shows that recover firms (*i.e.* firms that regain their ISO 9001 certification status following a full one-year gap without certification) are unable to experience any abnormal economic performance, at least in the subsequent three-year period. This conclusion holds for different metrics of economic performance and ways of incorporating risk into the analysis, suggesting that the decision to recover a lost certification has no statistically significant impact on the firm's economic performance. Such findings help explain why only 17% of the Portuguese companies that decertify subsequently regain their ISO 9001 status. The reported results are also consistent with those of Nurcahyo et al. (2020), but not with the evidence presented by Lindlbauer et al. (2016). In particular, Nurcahyo et al. (2020) fail to find any significant relationship between regular recertification events and firm efficiency, whereas the latter paper uncovers a negative relationship between the same type of event and efficiency. These two early studies employ a methodological approach that is different from the one in this study. The two early studies (1) analyse firm efficiency, not economic performance; (2) use DEA, not an event study; (3) use a sample of firms operating in the healthcare industry, not a multi-industry sample; and most importantly, (4) study continuous recertification, not certification recovery, following a medium-term period of decertification. This study's results contrast also with Hernandez-Vivanco and Bernardo (2023), who, using stochastic frontier analysis (SFA) on a composite measure of productive efficiency, including non-financial indicators, found that ISO 9001 certification retrieval had a negative effect.

Two possible explanations as to why the sample firms in this study do not attain abnormal performance after certification recovery can be found in some of the contingency factors that can influence the level of performance after (re)certification (see section 2.1). First, the internalization degree of the standard (Tari et al., 2020, 2022). Organisations that lose their certification are likely to have failed in the internalization of the standard. Thus, the lack of abnormal performance in the post-certification recovery period may be a result of these companies persisting in not internalizing the standard in their quality management processes, even after the certification recovery. Lack of internalization of the standard, consequently, leads to insignificant abnormal performances (Boiral & Roy, 2007; Corbett et al., 2005; Tari et al., 2020, 2022), even in the context explored in this paper.

The second contingency factor that might be considered is the motivation these firms have to certify. Motivations are usually distinguished between internal and external, including in the decertified pool of firms (Ferreira & Cândido, 2021). Firms internally motivated that lose the certification may continue to be internally motivated, and firms with external motivations may continue to need the certification for external image (legitimacy) related reasons. Therefore, the reasons for an insignificant abnormal performance after certification recovery may continue to depend on firms' motivation. Internally motivated firms may persist in the lack of internalization of the standard (as previously noted) whereas externally motivated firms are likely to exhibit an even lower level of internalization of the standard, given their focus on the external image (legitimacy) that the certification confers. Thus, both the certification motivations and the persistence of a low internalization degree of the standard can help to explain the lack of abnormal performance in the sample firms in the post-certification recovery period this paper considers.

5.1. Implications for theory

This study addresses the original research question of whether ISO 9001 certification recovery has any significant impact on firm's economic performance. The empirical evidence clearly suggests that this is not the case. Such finding is important since it helps explain why the majority of firms that lose their ISO 9001 certification do not subsequently recover such a status ($100\% - 17\% = 83\%$). In fact, the documented lack of improvement in economic performance is likely to deter companies from incurring the cost (in both time and money) that a certification recovery procedure entails. Critically, this paper's main conclusion also challenges the early literature claiming that, in general, ISO 9001 certification helps improve performance, and that the benefits accrue over long periods. In particular, the present research shows that this might not be the case, at least for companies that regain ISO 9001 certification after operating for a one-year period without being registered. In contrast, this paper provides empirical evidence to suggest that the decision to recover a lost ISO 9001 certificate is economically irrelevant. As argued above, such lack of economic impact may be explained by contingency factors, in particular: (1) the internalization degree of the standard that decertified firms can attain after certification recovery, and (2) the motivations to recover the lost ISO 9001 certification. Future studies might explore these aspects further with the help of quantitative methods based on structural equation models, regression analysis or panel data.

5.2. Implications for practice

Implications for firms

Firms that lose their ISO 9001 certification are likely to be better off if they do not attempt to recover such a distinction. In fact, as this study shows, from an economic standpoint, on average, certification recovery will not improve their performance relative to what one could reasonably expect given their risk characteristic. Yet, it should be noted that the previous literature does seem to suggest that companies that seek to be ISO certified for internal motivations may exhibit a more positive post-recertification performance. In a similar vein, externally motivated companies, whose stakeholders require certification, must look at the present results with caution. In effect, their need for external legitimacy may justify recovering their ISO 9001 certification even in the absence of any significant economic abnormal gains as this is vital for them to continue operating normally.

Implications for certification bodies and consultants

Previous studies argue that audited firms would benefit from more careful external audits and more helpful feedback from the certification bodies (Castka, 2018; Nurcahyo et al., 2020). This study adds to this literature as it suggests that any certification recovery effort must be managed with care. In particular, certification bodies (and consultants) should be aware that such efforts are unlikely to impact positively on the economic performance of firms, which calls for the need of a thoughtful consideration from the auditing (and consulting) organisation towards the specific situation of each client. This entails providing information that is meaningful and useful to the ISO recovering organisation, bearing in mind its internal context and, in particular, its certification motivations, internalization degree, culture, and receptiveness to change.

Implications for the ISO 9001 governance system

ISO 9001 has reached the maturity stage and, in some developed countries, is now declining (Mastrogia-como et al., 2021). Thus, as a product, ISO 9001 seems to need a revision, at least in the most developed countries. In contrast, in developing countries, where the number of certified companies continues to increase, a revision of the standard is not necessary and might be detrimental. This leaves the ISO 9001 governance system with a dilemma since having specific standards for different ‘markets’ is not viable. In any case, this research shows that something must be done to motivate decertified firms to regain their ISO status. For instance, in the future, the standard, and the certification bodies, could help firms seek (re)certification for internal reasons and, at the same time, facilitate the internalization of the requirements in the quality management processes. These suggestions are in line with those of Fonseca et al. (2023), who call for a simplification in language, clarification of the standard, improvement in consistency of interpretation, and making the standards easier to apply and audit.

5.3. Limitations of the study

The study has limitations that constitute opportunities for further research. The first limitation is the setting of the research. Portugal is a European developed country, but there are differences between developed countries that might limit the generalizability of the research conclusions. These differences include, for instance, (1) the proportion of certified firms in the country and in each of its economy sectors, (2) the strength of government, sectorial, and local incentives for firm certification, (3) the relevance attributed to the certification, and (4) the proportion of companies recovering their ISO 9001 certification in each country. Thus, further research is required to assess the generalisability of the results, particularly in developing countries, in developed countries with stronger governmental incentives towards ISO 9001 certification than Portugal, and where the rates of ISO 9001 adoption, withdrawal, and certification recovery are significantly distinct from those of Portugal.

The second limitation is related to the research method employed. An event study is a longitudinal method with significant comparative advantages over most of the cross-sectional studies in the field of ISO 9001. However, one main disadvantage of the longitudinal event study methodology is that, although it can control for financial variables and industry affiliation, as is the case in this research, it does not easily control for firm specific contextual factors. These include, for instance, the individual firm’s preparation for certification (Esgarrancho & Cândido, 2020), internalization degree of the ISO 9001 standard (Tari et al., 2020), certification and decertification motivations (Ferreira & Cândido, 2021), and other issues such as implementation obstacles (Cândido & Santos, 2011, 2015) and fraud in certification processes (Kafel & Nowicki, 2014), all of which can have an impact on ISO certification recovery and may be considered in future research with other alternative research methods.

The third limitation is the inability to examine sectoral differences. The sample includes only 16 firms in the largest sector (health care), 9 in manufacturing, and even fewer in all other sectors (Section 4.1), which prevents statistically reliable multi-group analyses. A visual inspection suggests no clear sectoral patterns, but this issue cannot be formally assessed with the available data. Future research with larger and more balanced samples across industries is needed to explore potential sectoral differences.

The fourth and last limitation concerns the performance measures used. Tobin’s q , a widely employed market-based indicator of firm performance, could not be computed because none of the firms in the sample are publicly traded. Without observable market values of equity, estimating Tobin’s q would require strong assumptions and introduce substantial noise, particularly given the limited financial information available for these firms. Future research using samples that include publicly listed organisations could incorporate Tobin’s q as a complementary performance metric.

Notes

1. Not all AMADEUS firms have data available to compute all the variables of interest. An average of 264 378 companies are included in the computation of the statistics for the AMADEUS population presented in Table 4.
2. The only exception is the parametric evidence for the event period $t-1$ to $t+1$. The respective Wilcoxon signed-rank and the sign tests are, however, not statistically significant at normal levels.

Acknowledgement

The authors would like to thank Inês dos Santos Serafim for her help. The authors are also grateful for the insightful comments from two anonymous reviewers which have greatly contributed to the improvement of this article.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This research was supported by national funds from the Fundação para a Ciência e a Tecnologia (FCT) under the project [UID/04007/2025]. FCT was not involved in the study's design, data collection, analysis, interpretation, manuscript writing, or the decision to submit this article for publication.

Data availability statement

Data available on request from the authors.

ORCID

Carlos J.F. Cândido  <http://orcid.org/0000-0001-5875-1243>

Luís M. Serra Coelho  <http://orcid.org/0000-0002-8074-4194>

Rúben M.T. Peixinho  <http://orcid.org/0000-0003-4178-3008>

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. <https://doi.org/10.1108/IJQRM-02-2014-0021>
- Alič, M. (2014). Impact of ISO 9001 certification cancellation on business performance: A case study in slovenian organisations. *Total Quality Management & Business Excellence*, 25(7-8), 790–811. <https://doi.org/10.1080/14783363.2014.906107>
- Barber, B., & Lyon, J. (1996). Detecting abnormal operating performance: The empirical power and specification of test statistics. *Journal of Financial Economics*, 41(3), 359–399. [https://doi.org/10.1016/0304-405X\(96\)84701-5](https://doi.org/10.1016/0304-405X(96)84701-5)
- Basir, S. A., & Davis, J. (2018). ISO 9000 maintenance measures: The case of a Malaysian local authority. *Total Quality Management & Business Excellence*, 29(1-2), 185–201. <https://doi.org/10.1080/14783363.2016.1172480>
- Benner, M. J., & Veloso, F. M. (2008). ISO 9000 practices and financial performance: A technology coherence perspective. *Journal of Operations Management*, 26(5), 611–629. <https://doi.org/10.1016/j.jom.2007.10.005>
- Blind, K., Mangelsdorf, A., & Pohlisch, J. (2018). The effects of cooperation in accreditation on international trade: Empirical evidence on ISO 9000 certifications. *International Journal of Production Economics*, 198, 50–59. <https://doi.org/10.1016/j.ijpe.2018.01.033>
- Boiral, O., & Roy, M.-J. (2007). ISO 9000: Integration rationales and organizational impacts. *International Journal of Operations & Production Management*, 27(2), 226–247. <https://doi.org/10.1108/01443570710720630>
- Briscoe, J. A., Fawcett, S. E., & Todd, R. H. (2005). The Implementation and Impact of ISO 9000 among Small Manufacturing Enterprises. *Journal of Small Business Management*, 43(3), 309–330. <https://doi.org/10.1111/j.1540-627X.2005.00139.x>
- 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. <https://doi.org/10.1016/j.ijpe.2017.12.001>
- Camango, C., & Cândido, C. J. F. (2023). ISO 9001 maintenance, decertification and recertification: A systematic literature review. *Total Quality Management & Business Excellence*, 34(13-14), 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., 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. <https://doi.org/10.1080/14783363.2019.1625266>
- 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(15-16), 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., & Santos, S. P. (2011). Is TQM more difficult to implement than other transformational strategies? *Total Quality Management & Business Excellence*, 22(11), 1139–1164. <https://doi.org/10.1080/14783363.2011.625185>
- Cândido, C. J. F., & Santos, S. P. (2015). Strategy implementation: What is the failure rate? *Journal of Management & Organization*, 21(2), 237–262. <https://doi.org/10.1017/jmo.2014.77>
- Carvalho, R. S. M. C., & 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. <https://doi.org/10.1080/14783363.2021.1996224>
- Castka, P. (2018). Modelling firms' interventions in ISO 9001 certification: A configurational approach. *International Journal of Production Economics*, 201, 163–172. <https://doi.org/10.1016/j.ijpe.2018.05.005>
- Chiarini, A. (2019). Why are manufacturing SMEs cancelling their ISO 9001 certification? Research from Italy. *Production Planning & Control*, 30(8), 639–649. <https://doi.org/10.1080/09537287.2019.1566840>
- Clougherty, J. A., & Grajek, M. (2014). International standards and international trade: Empirical evidence from ISO 9000 diffusion. *International Journal of Industrial Organization*, 36(4), 70–82. <https://doi.org/10.1016/j.ijindorg.2013.07.005>
- Clougherty, J. A., & Grajek, M. (2023). Decertification in quality-management standards by incrementally and radically innovative organizations. *Research Policy*, 52(1), 104647–16. <https://doi.org/10.1016/j.respol.2022.104647>
- Corbett, C. J., Montes-Sancho, M. J., & Kirsch, D. A. (2005). The financial impact of ISO 9000 certification in the United States: An empirical analysis. *Management Science*, 51(7), 1046–1059. <https://doi.org/10.1287/mnsc.1040.0358>
- Delfino, P. M. V., Peixinho, R. M. T., Cândido, C. J. F., & Coelho, L. M. S. (2024). A survey on ISO 9001 decertified companies: The three stages leading to withdrawal. *Total Quality Management & Business Excellence*, 35(15-16), 1788–1815. <https://doi.org/10.1080/14783363.2024.2399699>
- Dick, G. P. M., Heras, I., & Casadesús, M. (2008). Shedding light on causation between ISO 9001 and improved business performance. *International Journal of Operations & Production Management*, 28(7), 687–708. <https://doi.org/10.1108/01443570810881811>
- 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. <https://doi.org/10.1108/IJQRM-10-2014-0151>
- Dočekalová, M. P., Balcerzak, A. P., Luňáček, J., Doubravský, K., Meluzín, T., & Łapińska, J. (2024). Impact of ISO 14001, ISO 9001 and ISO 45001 on economic performance and competitive potential of European companies. *Journal of Competitiveness*, 16(4), 219–241. <https://doi.org/10.7441/joc.2024.04.11>
- Du, Y., Yin, J., & Zhang, Y. (2016). How innovativeness and institution affect ISO 9000 adoption and its effectiveness: Evidence from small and medium enterprises in China. *Total Quality Management & Business Excellence*, 27(11-12), 1315–1331. <https://doi.org/10.1080/14783363.2015.1075874>
- 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(1-2), 23–42. <https://doi.org/10.1080/14783363.2017.1404428>
- Evans, J. R., & Lindsay, W. M. (2014). *Managing for quality and performance excellence*. Cengage.
- 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, 1–14. <https://doi.org/10.1016/j.ijpe.2020.108024>
- Fonseca, L., Domingues, P., Nóvoa, H., Simpson, P., & Sá, J. G. (2023). ISO 9001:2015: The view from the conformity assessment community. *Total Quality Management & Business Excellence*, 34(5-6), 558–579. <https://doi.org/10.1080/14783363.2022.2073212>
- 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. <https://doi.org/10.1108/IJQRM-04-2015-0064>
- Guo, Y., Fan, D., & Zhang, X. (2020). Social media-based customer service and firm reputation. *International Journal of Operations & Production Management*, 40(5), 575–601. <https://doi.org/10.1108/IJOPM-04-2019-0315>
- Häversjö, T. (2000). The financial effects of ISO 9000 registration for Danish companies. *Managerial Auditing Journal*, 15(1/2), 47–52. <https://doi.org/10.1108/02686900010304632>
- Heras, I., Casadesús, M., & Dick, G. P. M. (2002). ISO 9000 certification and the bottom line: A comparative study of the profitability of basque region companies. *Managerial Auditing Journal*, 17(1/2), 72–78. <https://doi.org/10.1108/02686900210412270>

- Hernandez-Vivanco, A., & Bernardo, M. (2023). Management systems and productive efficiency along the certification life-cycle. *International Journal of Production Economics*, 266, 1–19. <https://doi.org/10.1016/j.ijpe.2023.109028>
- 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. <https://doi.org/10.1016/j.ijpe.2019.07.016>
- 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. <https://doi.org/10.3846/16111699.2015.1110712>
- ISO. (2012a). *Quality management principles*. ISO Central Secretariat.
- ISO. (2012b). *The ISO survey of management system standard certifications – 2011*. ISO Central Secretariat.
- ISO. (2015a). *The ISO survey of management system standard certifications – 2014*. ISO Central Secretariat.
- ISO. (2015b). *ISO 9001:2015 quality management systems requirements*.
- Jacob, L. A., Gandure, J., & Kommula, V. P. (2025). Investigation of sustainability failures of ISO 9001 quality management system – a case of Botswana. *International Journal of Quality & Reliability Management*, 42(1), 33–60. <https://doi.org/10.1108/IJQRM-07-2023-0223>
- 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., & Simon, A. (2017). The reasons for decertification of ISO 9001: Financial aspects. *Quality Innovation Prosperity*, 21(3), 173–184. <https://doi.org/10.12776/qip.v21i3.1024>
- 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. <https://doi.org/10.1108/IJQRM-10-2017-0204>
- Karapetrovic, S., Casadesu, M., & Heras, I. (2010). What happened to the ISO 9000 lustre? An eight-year study. *Total Quality Management & Business Excellence*, 21(3), 245–267. <https://doi.org/10.1080/14783360903553149>
- Kim, C.-B., Kwon, S.-H., & Park, Y.-Y. (2015). The influences of quality management system standards (ISO 9000) on supply chain innovation and business performance. *Journal of Korea Trade*, 19(2), 23–50.
- Kiryanto, K., Kartika, I., & Zaenudin, Z. (2022). Stock price reaction on ISO 9001 certification announcement: Evidence from Indonesia. *International Journal of Quality & Reliability Management*, 39(2), 612–629. <https://doi.org/10.1108/IJQRM-04-2020-0127>
- Kotter, J. P. (2007). Leading change: Why transformation efforts fail. *Harvard Business Review*, 85(1), 96–103.
- Kriemadis, A., Sainis, G., & Haritos, G. (2022). The impact of quality management systems on financial performance under crisis conditions: Evidence from SMEs. *Total Quality Management & Business Excellence*, 33(15-16), 1846–1871. <https://doi.org/10.1080/14783363.2021.2005461>
- 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(7-8), 941–957. <https://doi.org/10.1080/14783363.2016.1237285>
- Lando, K. K., Sudiro, A., Moko, W., & Indrawati, N. K. (2024). The effect of service quality on recertification mediated by customer satisfaction and relationship commitment. *Economic Studies (Ikonomicheski Izsledvania)*, 33(6), 160–179. No DOI available.
- Laskurain-Iturbe, I., Arana-Landín, G., Heras-Saizarbitoria, I., & Boiral, O. (2021). How does IATF 16949 add value to ISO 9001? An empirical study. *Total Quality Management & Business Excellence*, 32(11-12), 1341–1358. <https://doi.org/10.1080/14783363.2020.1717332>
- Latan, H., Jabbour, C. J. C., Jabbour, A. B. L. S., Fiorini, P. C., & Foroapon, C. (2020). Innovative efforts of ISO 9001-certified manufacturing firms: Evidence of links between determinants of innovation, continuous innovation and firm performance. *International Journal of Production Economics*, 223, 107526–13. <https://doi.org/10.1016/j.ijpe.2019.107526>
- 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. <https://doi.org/10.1016/j.ejor.2015.10.029>
- 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(15-16), 1694–1712. <https://doi.org/10.1080/14783363.2020.1769474>
- Lo, C. K. Y., Wiengarten, F., Humphreys, P., Yeung, A. C. L., & Cheng, T. C. E. (2013). The impact of contextual factors on the efficacy of ISO 9000 adoption. *Journal of Operations Management*, 31(5), 229–235. <https://doi.org/10.1016/j.jom.2013.04.002>
- 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. <https://doi.org/10.1016/j.ijpe.2018.03.028>
- Lo, L. K., & Chang, D. S. (2007). The difference in the perceived benefits between firms that maintain ISO certification and those that do not. *International Journal of Production Research*, 45(8), 1881–1897. <https://doi.org/10.1080/00207540600733709>

- Martínez-Costa, M., Martínez-Lorente, A. R., & Choi, T. Y. (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. <https://doi.org/10.1016/j.ijpe.2007.02.046>
- Mastrogiacomo, L., Carrozza, A., Maisano, D. A., & Franceschini, F. (2021). Is ‘post-decline’ the next phase of the diffusion of ISO 9001 certifications? New empirical evidence from European countries. *Total Quality Management & Business Excellence*, 32(11-12), 1384–1403. <https://doi.org/10.1080/14783363.2020.1724508>
- McGuire, S. J., & Dilts, D. M. (2008). The financial impact of standard stringency: An event study of successive generations of the ISO 9000 standard. *International Journal of Production Economics*, 113(1), 3–22. <https://doi.org/10.1016/j.ijpe.2007.02.045>
- Mekić, E., & Dinc, M. S. (2021). ISO 9001 effectiveness and financial performance of bosnian exporters: Investigating mediators. *European Journal of International Management*, 16(1), 148–165.
- Miller, S., Jayaram, J., & Xu, K. (2018). Obtaining global certification. *International Journal of Operations & Production Management*, 38(4), 957–978. <https://doi.org/10.1108/IJOPM-03-2017-0155>
- Naveh, E., & Marcus, A. (2005). Achieving competitive advantage through implementing a replicable management standard: Installing and using ISO 9000. *Journal of Operations Management*, 24(1), 1–26. <https://doi.org/10.1016/j.jom.2005.01.004>
- Neves, M. E. D., Reis, S., Reis, P., & Dias, A. G. (2024). Impact of ISO 14001 and ISO 9001 adoption on corporate performance: evidence on a bank-based system. *International Journal of Productivity and Performance Management*, 73(5), 1641–1667. <https://doi.org/10.1108/IJPPM-08-2022-0398>
- Nurcahyo, R., Kristiningrum, E., & Sumaedi, S. (2020). ISO 9001-certified public healthcare center’s efficiency and recertification. *International Journal of Productivity and Performance Management*, 69(4), 794–812. <https://doi.org/10.1108/IJPPM-11-2018-0406>
- Podrecca, M., Sartor, M., & Nassimbeni, G. (2025). Decertification from international management standards: A systematic literature review and research agenda. *The TQM Journal*, 37(9), 51–80. <https://doi.org/10.1108/TQM-01-2025-0023>
- 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. <https://doi.org/10.1108/0144357111098753>
- Psomas, E., & Antony, J. (2015). The effectiveness of the ISO 9001 quality management system and its influential critical factors in Greek manufacturing companies. *International Journal of Production Research*, 53(7), 2089–2099. <https://doi.org/10.1080/00207543.2014.965353>
- Ronalter, L. M., Hernandez-Vivanco, A., Bernardo, M., & Romaní, J. (2024). Management systems standards and shareholder wealth: Unveiling the role of multiple certifications. *Total Quality Management & Business Excellence*, 35(11-12), 1255–1273. <https://doi.org/10.1080/14783363.2024.2366509>
- Saboya, L. M., Cândido, C. J. F., & Cesário, M. I. S. (2025). Certification, maintenance and decertification of standardised innovation management systems: Motivations, barriers and benefits. *Creativity and Innovation Management*, 34(3), 541–563. <https://doi.org/10.1111/caim.12655>
- 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. <https://doi.org/10.1080/14783363.2013.807683>
- 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. <https://doi.org/10.1108/02656711211270351>
- Sansalvador, E., & Brotons, M. (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. <https://doi.org/10.1080/14783363.2014.929231>
- Sfakianaki, E., & Kakouris, A. P. (2020). Obstacles to ISO 9001 certification in SMEs. *Total Quality Management & Business Excellence*, 31(13-14), 1544–1564. <https://doi.org/10.1080/14783363.2018.1490640>
- Sfreddo, 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(3-4), 389–409. <https://doi.org/10.1080/14783363.2018.1549939>
- Sila, I. (2007). Examining the effects of contextual factors on TQM and performance through the lens of organizational theories: An empirical study. *Journal of Operations Management*, 25(1), 83–109. <https://doi.org/10.1016/j.jom.2006.02.003>
- 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(13-14), 1614–1632. <https://doi.org/10.1080/14783363.2020.1756246>
- Simmons, B. L., & White, M. A. (1999). The relationship between ISO 9000 and business performance: Does registration really matter? *Journal of Managerial Issues*, 11(3), 330–344.
- Simon, A., & Kafel, P. (2018). Reasons for decertification of ISO 9001. An empirical study. *Innovar*, 28(70), 69–80. <https://doi.org/10.15446/innovar.v28n70.74449>
- 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. <https://doi.org/10.1108/IJQRM-11-2018-0312>

- 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. <https://doi.org/10.1016/j.ijpe.2018.04.028>
- Sroufe, R., & Curkovic, S. (2008). An examination of ISO 9000:2000 and supply chain quality assurance. *Journal of Operations Management*, 26(4), 503–520. <https://doi.org/10.1016/j.jom.2007.06.006>
- 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(sup1), S274–S290. <https://doi.org/10.1080/14783363.2019.1665867>
- 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. <https://doi.org/10.1080/10429247.2019.1671764>
- Tarí, J. J., Pereira-Moliner, J., Molina-Azorín, J. F., & López-Gamero, M. D. (2022). The relationship between internalisation of a quality standard and customer results via employee and social results in the hotel industry. *Total Quality Management & Business Excellence*, 33(13-14), 1656–1673. <https://doi.org/10.1080/14783363.2021.1996223>
- Terziovski, M., & Power, D. (2007). Increasing ISO 9000 certification benefits: A continuous improvement approach. *International Journal of Quality & Reliability Management*, 24(2), 141–163. <https://doi.org/10.1108/02656710710722266>
- Ullah, B. (2020). Signaling value of quality certification: Financing under asymmetric information. *Journal of Multinational Financial Management*, 55, 100629. <https://doi.org/10.1016/j.mulfin.2020.100629>
- Uşar, D. D. (2024). Impact of ISO certifications on corporate financial performance: Evidence from Istanbul stock exchange-listed manufacturing companies. *Sustainability*, 16(16), 7021–7029, Article 7021. <https://doi.org/10.3390/su16167021>
- Vetchagool, W., Augustyn, M. M., & Tayles, M. (2021). ISO 9000, activity based costing and organizational performance. *Total Quality Management & Business Excellence*, 32(3-4), 265–288. <https://doi.org/10.1080/14783363.2018.1549938>
- Wahid, R. A., & Corner, J. (2009). Critical success factors and problems in ISO 9000 maintenance. *International Journal of Quality & Reliability Management*, 26(9), 881–893. <https://doi.org/10.1108/02656710910995073>
- Wayoro, D., Nonguierma, W., & Parkouda, M. (2025). Upfront efforts for upcoming benefits? ISO 9001:2015 certification and firms' performance in 33 countries. *International Economics*, 183, 100620–15, Article 100620. <https://doi.org/10.1016/j.inteco.2025.100620>
- Wiengarten, F., Humphreys, P., Onofrei, G., & Fynes, B. (2017). The adoption of multiple certification standards: Perceived performance implications of quality, environmental and health & safety certifications. *Production Planning & Control*, 28(2), 131–141. <https://doi.org/10.1080/09537287.2016.1239847>
- Wilson, J. P., & Campbell, L. (2016). Developing a knowledge management policy for ISO 9001: 2015. *Journal of Knowledge Management*, 20(4), 829–844. <https://doi.org/10.1108/JKM-11-2015-0472>
- Yu, J., & Xiao, S. (2023). Project certification and screening in the reward-based crowdfunding market. *Journal of Business Research*, 165, 1–12. <https://doi.org/10.1016/j.jbusres.2023.114004>