The Importance of the ISO9001 Certification on the Financial Results of Portuguese Pharmacies

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Abstract
In the last decades, quality management has become an essential tool for companies looking to gain sustainability and competitive advantage, and thus survive an increasingly competitive market. Portuguese pharmacies were no exception, and implemented mechanisms capable of boosting their financial and operational results. This work aims to study the relationship between the pharmacies certified by ISO 9000 and non-certified pharmacies, in the year 2015 in Portugal, and the impact that this certification caused on the financial results presented by these companies in the same year. In this study, the relationship between some financial ratios of Portuguese pharmacies (Return on Equity, Return on Used Capital, Profit Margin, Solvency Ratio and Liquidity Ratio) was analyzed through a Mann-Whitney econometric test, comparing the results with a sample of pharmacies that did not obtain certification by ISO 9000. Based on this study, it is concluded that in Portuguese pharmacies the existence of ISO 9000 certification is not relevant to the financial results since only on two variables, Return on Equity and Return on Capital used, there is a significant and positive difference. In the other variables studied, the existence, or not, of the certification has no influence on the results. Finally, it is also concluded that the variable Return on Equity is strongly influenced by the existence of the ISO certification, since this ratio oscillates strongly in the comparison between certified pharmacies versus non-certified pharmacies.

Keywords: Pharmacies, ISO9000, Sustainability, Performance, Quality Management, Financial Results.
Introduction

Since the 1950’s companies have been increasingly concerned about quality management. According to Martínez-Costa and Martínez-Lorente (2007), quality management clearly contributes to increase customer satisfaction and trust. On the other hand, the introduction of quality standards and processes enables a reduction of internal costs, an increase in productivity and a continuous improvement in image and processes, and it also allows easy access to new markets (Gotzamani, Theodorakioglou & Tsiotras, 2006). In this context, quality management is a strategic and competitive factor, since it allows evaluating the conformities determined by the organization for its products and/or services, through internal processes, guaranteeing the client a product designed according to standards, procedures and norms that are quite well defined and delineated.

Also according to Soares (2014), quality comes as a motor for a strategy focused on the client, which will meet their explicit and implicit expectations, while increasing productivity.

Quality certification is a visible face of quality management. The ISO 9001 norm belongs to the ISO 9000 family and is characterized by an extensive set of requirements standards, guidelines and other supporting documents that, together, can provide users with a set of tools with which they can manage and improve their organizations.

The International Organization for Standardization (ISO) is formed by a Technical Committee that develops a universal set of accepted norms in the field of quality. This Committee started its work in 1989 and the number of companies adopting this set of requirements has grown exponentially. The ISO 9000 norms set originally published in 1987 has since undergone two improvement cycles, including a smaller revision in 1994 and a deeper modification in 2000. However, certification according to the ISO 9001 norm refers to the Quality Management Systems (QMS) implemented in the company and not to the intrinsic quality of the products and services provided to customers, for which there are other certification processes.

According to Pinar and Ozgur (2007), ISO 9001 is the world's largest voluntary standard for companies and governments. The number of ISO 9001 norm certifications has increased exponentially on a global scale. In 2009, the number of certificates issued by the ISO 9001 standard was 1.064.785 distributed by 178 different countries according to the Certified Companies Guide 2010/2011. In 2009, Europe accounted for 46.53% of the world's share of certifications, with a relative decrease in the world's market share compared with 2005 (49.10%) (Certified Companies Guide, 2013). These values reveal the importance of this norm, mainly in the European continent, with Portugal having 0.47% of the world’s quota, the lowest value in the last 5 years.

Quality management aims ultimately to create value for shareholders and customers. Therefore, the literature presents several empirical studies that analyze the implications of quality management upon organizational performance (Beirão & Sarsfield-Cabral, 2002; Nicolau & Sellers, 2002; Martínez-Costa & Martínez-Lorente, 2007). Those studies have been developed over many sectors (e.g.: hospitality,
manufacturing) and in different countries such as Spain, Japan, Italy, the United States and New Zealand.

This empirical study aims to analyze the relationship between quality certification and the financial performance of Portuguese pharmacies. In the literature, no studies analyzing this sector were found. Pharmacies are mostly small companies, with an average of 5.7 employees, and reflect the permanent effort of the sector in the modernization of the infrastructures that they put at the service of the population.

Thus, certification by ISO 9001 is a relatively recent event in the pharmaceutical sector in Portugal. Of a total of 2,670 pharmacies only 54 were certified in the year under study. Thus, this paper seeks to contribute to a better knowledge about a topic that has received attention from the international academic community in other sectors.

**Literature review and research questions**

The adoption of a Quality Management System (QMS) is based on the need for companies to improve their competitiveness and create value for shareholders and customers. According to Kartha (2004) organizations have realized that the key to increase productivity and profitability is to improve quality and thus survive the competition. Companies are forced to return to the fundamentals of quality improvement management and cost competitiveness tailored to their products and/or services.

In the same line of thinking, Jitpaiboon and Rao (2007) point out that the globalization of the market, the high level of competition between companies, and the more demanding requirements established by clients, are among the most critical factors that influence and stimulate a company to implement a modern and effective Quality Management System.

Also Soares (2003) considers that the most relevant trends for the future are the increase of Quality in service companies, due to the increasing weight of services in the current economy.

The ISO 9000 norm family is an instrument for companies to start a process of implementing a QMS (Jitpaiboon & Rao, 2007). ISO has developed a set of quality requirements as a model for quality assurance in the project, production, installation and service, thus serving as a tool for the beginning of the implementation of such a system. For many companies, ISO 9000 are the starting point of a system that guarantees the quality of their products and/or services.

Also according to Magd and Nabulsi (2012), companies certified by ISO 9001 reveal a willingness to adopt the principles of a management model according to total quality. But regardless of all the efforts and research projects already undertaken under the ISO 9001 norm, results that are significantly contradictory and unanswered questions, still remain (Sampaio, Saraiva & Rodrigues, 2009).

The literature presents a large number of empirical studies that analyze the impact of QMS on company performance (Dannu & Ayokanmbi, 2008; Feng, Terziovski &
Samson, 2008; Pinar & Ozgur, 2007; Saizarbitoria & Landini, 2006). The meta-analysis works developed by Jitpaiboon and Rao (2007) and Claver-Cortés, Molina-Azorin, Pereira-Molina and López-Gamero (2007) present a synthesis of the studies on the subject. In general, the results of the meta-analysis of these two studies do not show the unequivocal existence of a positive relationship between the adoption of QMS and business performance. This fact extends to the effect of ISO 9001 on the performance of companies (Lafuente, Bayo-Moriones & García-Cestona, 2009). Depending on the author and the country under study, different conclusions are reached about the impact of the norm.

According to Beirão and Sarsfield-Cabral (2002) and Nicolau and Sellers (2002), there is a positive effect on the stock market in the United States, Portugal and Spain after certification. Nevertheless, Martínez-Costa and Martínez-Lorente (2003) state that there is no relationship between the stock market and certification in the Spanish market. In turn, Aarts and Vos (2001) indicate that there is a negative relationship between the results presented and ISO 9000 certification in New Zealand. There are also other authors (Gotzamani et al., 2006), stating that the implementation of this norm leads to a number of benefits:

- improvements in the internal and operational organization of companies;
- improvements in internal and external communication;
- employees that are more aware about the importance of quality;
- improvements in the quality of the goods produced and services provided;
- the reduction of quality costs;
- and, lastly, a greater consumer satisfaction and increased confidence in products.

On the other hand, there are other perspectives that are less optimistic concerning the results of implementing this set of standards. For example, Corrigan (1994) and Henkoff (1993) indicate that certification makes processes more bureaucratic, less flexible and reduces innovation. This view is partly shared by Stephens (1997) who states that the outcome after certification also depends on a continuous system of quality guarantee that is adaptable to external changes.

Another factor that strongly influences the success or failure of certification is the willingness to implement it correctly. According to Gotzamani et al. (2006), the maximum benefits of ISO 9001 certification are achieved when certification motivations are internal and true, that is, when they are part of a global strategy of the company.

Moreover, much of this willingness has to start from the top managers, and how they transmit it to the remaining employees. Therefore, the ISO 9001 norm should not be used only as a marketing tool or as a promotional action for the company, but rather as a way to achieve excellence (Jitpaiboon & Rao, 2007).
We can thus conclude that the existence of a QMS is positive for the performance of companies, as it contributes to continuous improvements in operational processes, documentation processes, increase in customer satisfaction, and a reduction in the number of errors. However, it should be noticed that, according to some authors, it is not consensual that the ISO 9001 norm is the best way to start a quality guarantee process.

**Research questions**

Pharmacies play an extremely important social role because they are part of a key sector for the well-being of citizens. Therefore, the improvement in the quality of the services provided may have very positive effects on the clients and investors of pharmacies.

The purpose of this analysis is to understand whether certification has a positive impact upon the financial results, and on which of these results the impact is most significant, helping us to understand how the ISO 9001 norm has an impact on the financial results of pharmacies.

This analysis will also be helpful in understanding where it is possible to improved, and where to invest at the time a pharmacy decides to implement the ISO 9001 certification, or opt for another quality management system.

Therefore, this study aims essentially to answer two research questions:

- Do companies certified by ISO 9001 in the pharmaceutical sector in Portugal obtain better financial results than non-certified companies do?
- Which indicators under study are the most susceptible to ISO 9001 certification?

In order to be able to answer these two questions, an econometric Mann-Whitney test will be applied, which will allow to assess the importance of certification by the ISO 9001 norm, by comparing the results of the certified sample with those of the control group, which corresponds to a set of non-certified pharmacies.

**Methodology**

The methodology used in this research is bibliographic and exploratory. The research is a bibliographical one because we used existing empirical studies about the impact of quality management systems on the performance of companies to our theoretical framework. This study is also exploratory because there are no studies on the impact of ISO 9001 upon Portuguese pharmacies.

The study focuses on Portuguese pharmacies that are certified by ISO 9001 and other non-certified pharmacies. The selection of the sample followed the following steps. In a first phase, starting from the Guide of Certified Companies of *Jornal de Negócios*, we verified that there were 54 pharmacies certified by the ISO 9001 norm at the end of the year under study.
However, the sample of this study considers only 30 certified pharmacies, as the remaining 24 pharmacies are sole proprietorships whose data are not considered in the databases that were used, or are recent pharmacies that do not have data available. The control sample of non-certified pharmacies consists of 90 pharmacies that were randomly selected.

The second stage consisted of the collection of the financial data through the database SABI (*Sistema de Análisis de Balances Ibéricos*), and through data provided by Informa D&B. Finally, the software used to carry out this study was the Statistical Package for the Social Sciences (SPSS).

In order to test the research hypothesis, the Mann-Whitney econometric test was used to verify if the level of performance among certified pharmacies is different from the performance of the control group of non-certified pharmacies.

The performance evaluation focused on the following financial indicators:

- **Return on Equity** is an indicator of the performance of the capital invested in the company by the shareholders/partners. The Return on Equity determines the attraction of potential investors in the long term;

- **Return on Used Capital** expresses the result of a company based on the used capital. Demonstrates the company's ability, through its production process, to generate value for investors in general;

- **Profit Margin** corresponds to the difference between total costs (fixed and variable) and the price that the consumer pays for the final product;

- **Solvency Ratio** demonstrates the proportion of company assets that are financed by equity capital against the proportion of third-party capital. The higher the value of the ratio, the more financially stable the organization is;

- **Liquidity Ratio** corresponds to the financial capacity of the company to meet its short-term liabilities, thus being a short-term solvency ratio.

**Results analysis and discussion**

The main objective of this study is to quantify the impact of the ISO 9000 certification on the financial results of pharmacies in Portugal in the year 2015, based on the comparison of the results of pharmacies that did not obtain this same certification.

Taking into account the population of pharmacies certified by the ISO 9001 norm in Portugal, of the approximately 2700 existing pharmacies, only around 2% of them are certified, from where we conclude that only a small number of pharmacies is certified.

Table 1 shows the descriptive statistics of financial performance variables. In general, the results show a large difference in Return on Equity and Return on Capital Used between the two samples, with the companies certified by ISO 9001 having better results than non-certified pharmacies.
The other three variables under study have identical results between the two samples, with the highest values occurring for the pharmacies without the ISO 9001 certification.

<table>
<thead>
<tr>
<th>Means</th>
<th>Return on Equity</th>
<th>Return on Used Capital</th>
<th>Profit Margin</th>
<th>Solvency Ratio</th>
<th>Liquidity Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certified</td>
<td>21,45</td>
<td>24,06</td>
<td>4,93</td>
<td>50,52</td>
<td>1,44</td>
</tr>
<tr>
<td>Non-Certified</td>
<td>5,77</td>
<td>12,21</td>
<td>5,38</td>
<td>51,66</td>
<td>2,17</td>
</tr>
<tr>
<td>Standard deviation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certified</td>
<td>25,53</td>
<td>27,71</td>
<td>11,92</td>
<td>26,19</td>
<td>1,52</td>
</tr>
<tr>
<td>Non-Certified</td>
<td>39,42</td>
<td>26,44</td>
<td>10,32</td>
<td>25,68</td>
<td>4,42</td>
</tr>
</tbody>
</table>

Table 1 - Descriptive Statistics of Financial Performance
Source: Authors

The Mann-Whitney test with $\alpha = 0.05$ was used to verify differences between certified and non-certified pharmacies. The test consists of a non-parametric test alternative to the t-Student test (because it is not possible to say with certainty that the sample was withdrawn from a population with a normal distribution) to compare the means of two independent samples. The Mann-Whitney test statistic can be defined as:

$$U_a = n_a n_b + \frac{n_a (n_a + 1)}{2} - \sum R_a$$

and

$$U_b = n_a n_b + \frac{n_b (n_b + 1)}{2} - \sum R_b$$

Table 2 shows the non-parametric test results, which point to a difference in the performance of certified and non-certified pharmacies, with the exception being the Solvency Ratio. For the variables Return on Equity, Return on Used Capital and Profit Margin, certified pharmacies perform better than pharmacies that are not certified by ISO 9001.
In the case of the Solvency Ratio the case is slightly different. The two samples have identical distributions (59,18 and 60,14) and the 'p' assumes the, rather high, value of 0,811. For the Solvency Ratio the conclusion is that we cannot reject the hypothesis of equality of performance between the two samples.

Finally, the Liquidity Ratio variable shows a behavior that indicates that non-certified pharmacies perform better than certified pharmacies.

In summary, the results suggest that there is a global difference in performance between the two samples of pharmacies under study, and in most cases the pharmacies that obtained the ISO 9001 certification have better average results than those who did not obtain the same certification.

<table>
<thead>
<tr>
<th></th>
<th>Mean Certified pharmacies</th>
<th>Mean Non-Certified pharmacies</th>
<th>Test Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return on Equity</td>
<td>74,20</td>
<td>55,93</td>
<td>939,00</td>
<td>0,013</td>
</tr>
<tr>
<td>Return on Used Capital</td>
<td>73,80</td>
<td>56,07</td>
<td>951,00</td>
<td>0,016</td>
</tr>
<tr>
<td>Profit Margin</td>
<td>70,87</td>
<td>56,34</td>
<td>1009,00</td>
<td>0,046</td>
</tr>
<tr>
<td>Solvency Ratio</td>
<td>59,18</td>
<td>60,94</td>
<td>1310,50</td>
<td>0,811</td>
</tr>
<tr>
<td>Liquidity ratio</td>
<td>48,25</td>
<td>64,58</td>
<td>982,50</td>
<td>0,026</td>
</tr>
</tbody>
</table>

Table 2 - Mann-Whitney test results
Source: Authors

Conclusions and recommendations

The existence of quality concerns is in many cases seen as a way for companies to obtain greater performance results. However, it is not certain that certification by ISO 9001 brings better results to certified organizations relative to those that choose not to certify.

It was the objective of this study to give a new perspective on the impact of ISO 9001 certification on the financial performance of pharmacies in Portugal in the year 2015 and thus to add a new contribution, supported by the application of different methodologies to two different samples.

Firstly, a simple averages analysis was performed (Table 1), comparing the averages of the certified pharmacies with the averages of the non-certified ones, and it was concluded that the certified pharmacies obtained better results in the Return on Equity and Return on Used Capital, and worse results in the other three variables under study.
These results appear contradictory as certified pharmacies have better Return on Equity, but then, on average, their Profit Margin, Solvency Ratio and Liquidity Ratio are worse. However, it should be noted that the difference obtained in any of these indicators, although higher in non-certified pharmacies, is very close to that obtained by certified pharmacies, which is not the case in the other two indicators, where the variation is quite high. Regarding this aspect, we have to take into account that we are analyzing only five indicators, and in the day-to-day business, there are a multiplicity of factors and variables that influence the results, which could not be taken into account.

Because in this first analysis it is not possible to draw a fully valid conclusion about the impact of quality standards upon financial results of these two samples, a Mann-Whitney statistical test was then carried out. Its main goal was to understand if any of the variables under analysis is influenced or not by the existence of the ISO 9001 certification.

We will now answer Question 1 of this study - Do companies certified by ISO 9001 in the pharmaceutical sector in Portugal obtain better financial results than non-certified companies do? - concluding that in the Portuguese pharmacies, in the year 2015, the existence of ISO 9001 certification is not relevant to the financial results. Only on two of the considered indicators, Return on Equity and Return on Capital Used, there is a significant and positive difference, whereas in the other indicators the existence, or not, of certification has no influence on results.

Regarding Question 2 - Which indicators are the most susceptible to certification by ISO 9001? - we can say that only the variable Return on Equity is strongly influenced by the existence of certification, as this ratio changes considerable in the comparison of certified versus non-certified pharmacies.

In short, it can be concluded that ISO 9001 does not have a significant relevance in the financial results of Portuguese pharmacies. However, it should be taken into account that when talking about pharmacies we are essentially referring to a place that sells products equal to those sold in other pharmacies. Most people usually opt for one or another pharmacy based on factors such as location and proximity to their home or workplace, rather than actually motivated by the quality of the service.

Concerning this study, it is also necessary to take into account some limitations, such as not analyzing whether the pharmacies considered as non-certified in the sample chose to adopt the ISO certification only partially, or if they are certified by other quality systems.

The main difficulties of this study were the collection of data, since most pharmacies are sole proprietorships and therefore do not have to submit financial data. It was also difficult to perceived understand the date of certification of each of the pharmacies that adopted the certification, so that a longitudinal analysis could be made.

This study addresses the impact of ISO 9001 certification on the performance of pharmacies in Portugal, in order to produce an empirical study of a subject as complex as the relevance of quality management in companies’ results. Being this such a vast subject it cannot be said that it has been advanced to exhaustion.
Therefore, it is suggested the study of the impact of not only the certification by the ISO norm but also by other quality systems.

For future work, a similar study may be carried out in other sectors, taking into account different indicators, in particular some that are not only financial, but also operational.

Another recommendation consists of performing a temporal analysis, that is, not to analyze the results of a single year, but to check the evolution of results over a given period. For this type of study, the period under analysis varies according to the studies carried out and the authors consulted.

For example, Corbett, Montes-Sancho and Kirsch (2005) consider a 10-year period, whereas Heras, Dick and Casadesús (2002) consider 5 years, and Martínez-Costa and Martínez-Lorente (2007) consider a 3 years period, reflecting this temporal difference, the different perception of time horizon of each author, in relation to the impact of certification upon results.
References


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