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ISO 9001:2015 in Moroccan Context: A Global Comparative Study, Considering Development Scores, Crises, and Economic Cycles

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Abstract:

In Morocco, certification ISO 9001:2015 is in high demand, so it is interesting to understand how different countries use these quality management systems to promote their success. From this perspective, a data survey was carried out regarding the number of companies certified by ISO 9001:2015 in Morocco and several countries, split into three groups according to their Gross Domestic Product (GDP) and Human Development Index (HDI). The first group consists of countries scoring some of the highest values in terms of GDP and HDI (respectively Switzerland, Germany, and Bulgaria); the second one consists of countries with low scores in their GDP and HDI (Ethiopia and Nigeria); and the third group lists countries with fair scores in both indexes (Morocco and Honduras). This comparative study may investigate how the level of development in Morocco and other countries influences the implementation and outcomes of ISO 9001:2015. Conclusions might address whether organizations in more developed regions exhibit better adherence to quality standards and whether these standards contribute differently to development across various regions.

Keywords: Quality Management Systems, certification, ISO 9001V 2015, HDI, GDP.

Classification JEL: L15

Paper type: Comparative Theoretical Study

1. Introduction

In a constantly changing global economic context, characterized by a sharp rise in customer needs and expectations. Within this competitive milieu, factors pivotal to maintaining competitiveness, notably quality, competitive pricing, and punctual delivery, assume paramount importance. Recognizing the imperative of remaining competitive, companies are increasingly inclined to embrace global managerial practices aimed at enhancing operational efficiency and effectiveness (Porter, 1998). One such practice involves the implementation of a Quality Management System (QMS) aligned with internationally recognized standards, such as the ISO 9001:2015 standard.

The ISO 9001:2015 standard serves as a comprehensive framework for organizations seeking to implement, establish, maintain, and continually improve their quality management systems (ISO 9001, 2015). By adhering to the principles outlined in this standard, companies endeavor to enhance customer satisfaction, streamline processes, minimize errors, and foster a culture of continuous improvement. Moreover, ISO 9001:2015 certification not only signifies a commitment to quality excellence but also enhances organizational credibility and facilitates access to global markets (Suárez-Barraza, et al, 2016).

Amidst the dynamic nature of the global economic environment, the adoption of ISO 9001:2015 represents a strategic response by companies to address the evolving needs and expectations of customers while striving to maintain competitiveness on a global scale. As such, understanding the implications of ISO 9001:2015 implementation within specific national contexts, such as Morocco, becomes essential for evaluating its effectiveness and identifying areas for improvement. Through empirical analysis and comparative studies, insights can be gleaned into the intersection of ISO 9001:2015 standards with local economic conditions, developmental trajectories, and crisis responses, thereby informing strategic decision-making processes and enhancing organizational performance.

Indeed, a QMS aims to optimize the operation of the company to best satisfy customers by avoiding "failures" and "non-qualities" as much as possible (Jean-Marc Gandy and Frédéric, 2019). However, various economic, technical, and societal issues are linked to the implementation of the ISO 9001 standard in organizations (British Standards Institution, 2022). Firstly, in economic terms, the ISO 9001 standard helps to improve operational performance. It helps to increase productivity and reduce the costs of non-quality, which can ultimately help to obtain a competitive advantage. In addition, ISO 9001 makes it possible to harmonize product/service specifications, making them more efficient. Harmonization of products and services can also allow organizations to access new national and international markets.

At the societal level, this same harmonization gives confidence to customers (stakeholders according to ISO 9001:2015) since the quality and efficiency of the products and services delivered are guaranteed. Ultimately, this can promote customer loyalty, or even the acquisition of new customers (ISO 9001, 2015).

In this context and given the importance of this standard in improving the effectiveness and efficiency of companies around the world, this work aims to analyse the evolution of many ISO 9001-certified companies. since 1993 to 2022 nationally and internationally.

In addition, making a comparison between Morocco and other developed countries and other developing countries helps to understand what difference there is between them. Thus, a deeper analysis identified the sectors most adherent to ISO 9001 certification. To do this we have adopted the following plan, initially, we will start with a theoretical framework relating to the quality management system and the ISO 9001 standard. There follows a presentation of the methodology adopted for this work, then we devote the following part to the presentation and analysis of the results obtained, and we finish this work with a conclusion and a presentation of the bibliography used.

2. Theoretical framework

About the various management systems, all organizations, whatever their type, size, and field of activity, generally seek to benefit from an efficient management system that is too adapted to the evolution of their needs and goals. In this sense, the ISO 9001 standard relating to the quality management system provides the company with good practices aimed at constantly improving its overall performance while avoiding errors related to all of its activities (Eva Giesen, 2008).

So, if we look back in history, it was the beginning of a perpetual success for management systems based on the ISO 9001 standard. This was first published in 1987 and has been regularly revised ever since. Its first revision dates from 1994, the next from 2000 (and integrated the notion of improvement process), the following ones took place in 2008 and finally, in 2015 (Nadja Goetz, 2022). During this evolution, several changes were applied both at the level of principles and at the level of managerial approaches, this remains dependent on the objectives that the organizations wish to achieve in a continuous manner, namely the satisfaction of their customers and their interested parties and the conformity of its products and services (DQS Maghreb, 2022).

Today, ISO 9001 certification can be considered a key success factor for developing sustainable performance in the interest of the company and making it a key player in their field of activity. Thus, the concrete advantages of obtaining ISO 9001 certification are multiple and can be listed as follows (Jean-Marc Gandy et Frédéric, 2016):

- Improvement of the image and credibility of the company: it is a better understanding and confidence on the part of the customer towards a certified company.
- Improved customer satisfaction: If a company adopts a QMS it is referred to as the focus on improving customer satisfaction by meeting their needs and expectations.
- Increased business productivity: The business must also set goals and measure its progress through compliance with standards that require business processes to be identified, documented, and tracked effectively and efficiently.
- Easy access to new markets: Compliance with standards allows the company to access new markets.
- Creation of a culture of continuous improvement: Have a link between the achievement of gains that are increasingly important, in terms of quality, cost, time, and other resources, and continuous improvement as a result principle of the QMS.
- Involvement of employees: To better find the best solutions and improve the various processes of the company, it is necessary to involve the staff in the strategic vision and the results of the company.

However, certification to ISO standards is a time-consuming process that requires a significant and resource-intensive investment. The duration of said certification process one of the major drawbacks, depends on the level of development of the system already in place and also depends on the efforts and commitments that can be devoted to it by the management and employees of an organization wishing to be certified. So, it should be said that committing to certification pushes the decision-maker to take a long-term risk. We are talking here about a commitment of at least 3 years, corresponding to a complete certification cycle.

To this end, if a certification requires an investment, it will generate a lot of costs, namely: buying the corresponding standard, using an external consultant, paying the certifying auditor, investing human and material resources for the implementation, and maintaining certification thereafter. It is more difficult to define the return on investment of these costs, quite simply, in most cases it is expensive. Thus, at the operational level of the organization, we can add a limit linked to audits which sometimes disrupt internal schedules and create a climate of resistance

among employees. Finally, the main disadvantage is not to obtain the certification but rather to lose it.

When preparing to implement a quality management system and before launching a quality approach in a company, it is important to know some of the key factors that contribute to the success of the approach. Here are the different success factors that are crucial for the implementation of a QMS (Andrew Holland, 2023):

- The first key factor in the success of the approach is the involvement of management. The latter must be convinced of the need for change internally.
- The close association of management with the project: management has a major responsibility in the development and involvement of employees.
- Staff involvement in the implementation of quality cannot succeed without significant staff input in the design and application phase.
- Effective time management: any project requires planning, organization, and follow-up to bring it to completion.
- Finally, communication is the key factor of success, unavoidable but often overlooked in the process. It is the responsibility of managers who must take charge of ensuring the proper processing and dissemination of information so that it is motivating for employees and creates a climate of trust and mutual respect.

3. Material and method

As mentioned earlier, the main objective of this article is to assess the evolution of the number of ISO 9001-certified companies at both the national and international scales, from 1993 to 2021 (Ibourk, A., Raoui, S, 2021). In addition, it aims to carry out a comparative analysis between Morocco and other developed and least developed countries (according to their GDP and HDI scores), to understand if there are significant differences between them. Thus, in a more precise analysis, this article evaluates the evolution of the ISO 9001 standard in Morocco to identify the sectors most adhering to certification by said standard.

Indeed, as part of this work, we conducted research to collect the necessary data relating to the evolution of certification in Morocco, then, and as long as the objective was to compare this evolution with other developed countries. and less developed based on the GDP and the HDI of 2021 we decided to study the following countries: Switzerland, Germany, Bulgaria, Honduras, Nigeria, and Ethiopia. Thus, we used the official ISO website to collect data on each country.

In addition, to facilitate the interpretation of the data collected, we have prepared a group of tables, in which we have calculated the percentage increase or decrease between each year, to understand more effectively the evolution of ISO 9001 certification over time. Subsequently, representative graphs of the results obtained were drawn up to allow a comparative analysis of Morocco with the selected countries to base our discussion and our conclusions on them.

4. Result

4.1 The evolution of certification for each country

ISO 9001 certification is a strategic choice and a factor of competitiveness for companies, the objective of this study is to understand the evolution of ISO 9001 certification over the years and to verify whether it varies from country to country. to the other.

We collected data on 7 countries based on their GDP and HDI, these are Morocco, Honduras, Ethiopia, Nigeria, Germany, Switzerland, and Bulgaria. Switzerland and Germany are ranked among the most developed countries in the world (Switzerland is ranked 1st in terms of the HDI

according to the report published by the United Nations Development Program (UNDP) in 2021 with a rate of 0.962% (PNUB, 2021) and with a GDP of 676,775 M€ (Countryeconomy, 2022) recorded in the said years. Bulgaria also recorded a high human development index. On the other hand, Morocco and Honduras are classified as medium-development countries in terms of HDI and GDP, and Ethiopia and Nigeria are low-development countries. Additionally, to understand whether disruptive incidents and the economic crisis have affected the number of certified companies around the world, we have identified major historical events (Table 1) that may have had an impact on the behaviour of these organizations.

Table 1: Relevant situations in world economy – Crisis years

1994	Emerging Markets Crisis
1997	The 2nd wave of the emerging market crisis
2008	Global Financial Crisis
2012	The European debt crisis
2020	The COVID-19 crisis
2021	The Russian-Ukrainian War
2021	The Global Energy Crisis

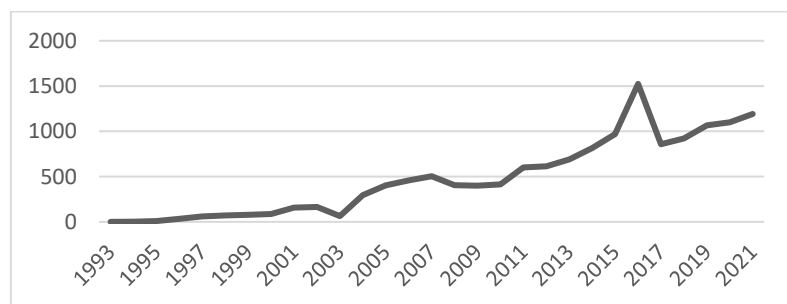
Source: Authors

After having identified these data, it is now possible to assess the evolution of certification in each country apart from 1993 until 2021, the results obtained are set out below.

Morocco:

In Morocco, the first certification was recorded in 1994, thus the analysis of the data collected shows a positive evolution of the certification with an exceptional evolution between 2010 and 2016, on the other hand, we note decreases in 2003 with a rate of decrease which is equal at (-60.98%) and in 2017 with a rate of (-43.77). In addition, we note an insignificant drop in 2008 with a rate of (-19.64) the latter can be explained by the world economic crisis of 2008, on the other hand, we note that the number of certified companies in 2020 increased with 3, 10% compared to the year of 2019 even with the spread of the COVID-19 pandemic, which reflects the solid resistance of the Moroccan economic fabric in the face of this health crisis experienced by the whole world.

Figure 1: The evolution of ISO 9001 certification in Morocco (1993 – 2021)

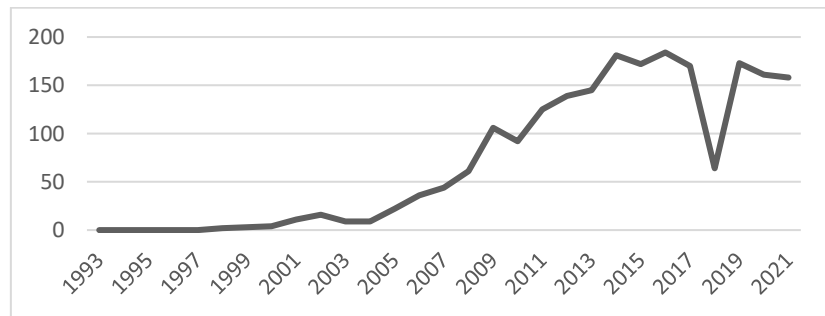


Source: Personal processing from ISO-2021 data

Honduras:

With more than 10.28 million inhabitants and a gross domestic product of 28,490 (billion USD) in 2021 (FMI, 2022) (a growth rate of 12.5% (World Bank, 2021)), the Honduran economy is in strong evolution, these positive influences the behaviour of companies in the country. indeed, according to the data collected, we note that the number of ISO 9001 certifications has been growing since the first certification was recorded in 1998, in addition a significant drop was recorded in 2017 (-62%), we also note that this drop continues in recent years also with lower rates of decline.

Figure 2: The evolution of ISO 9001 certification in Honduras (1993 – 2021)

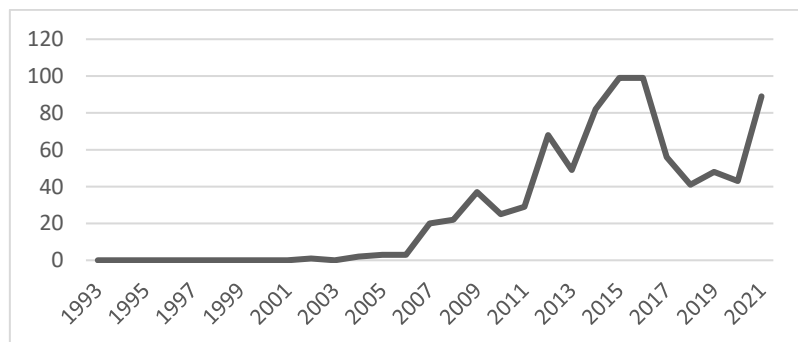


Source: Personal processing from ISO-2021 data

Ethiopia:

Ethiopia is ranked among the least developed countries in terms of the Human Development Index. The graph below shows that the certification of companies in the country only started in 2002 and just one year later (2003) there was no certification of companies in the country. Thus from 2006, the number of certifications began to register increases (567% in 2007), but also there were decreases over the years, the most significant of which was recorded in 2017 with a rate of -43%.

Figure 3: The evolution of ISO 9001 certification in Ethiopia (1993 – 2021)

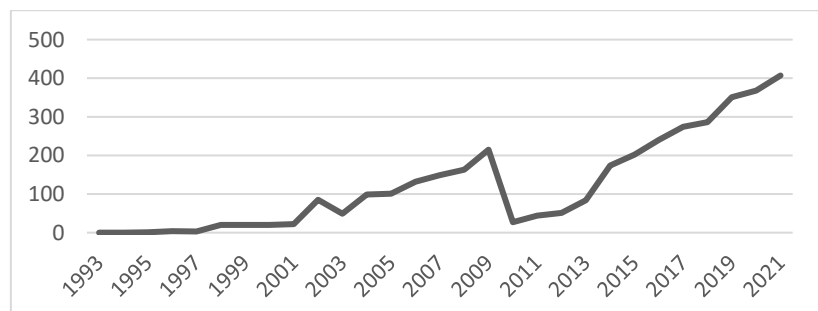


Source: Personal processing from ISO-2021 data

Nigeria:

The Nigerian economy grew by 3.6% in 2021, after contracting by 1.8% in 2020, this economy is dominated by crude oil, which accounts for about 10% of the country's GDP. Based on the data collected, we note that since 1995 and until 2009 the number of ISO 9001 certifications has grown significantly, while in 2010 there was a sharp decrease with a rate of -87%. Since 2011 there has been a rapid evolution in certified companies in the country.

Figure 4: The evolution of ISO 9001 certification in Nigeria (1993 – 2021)

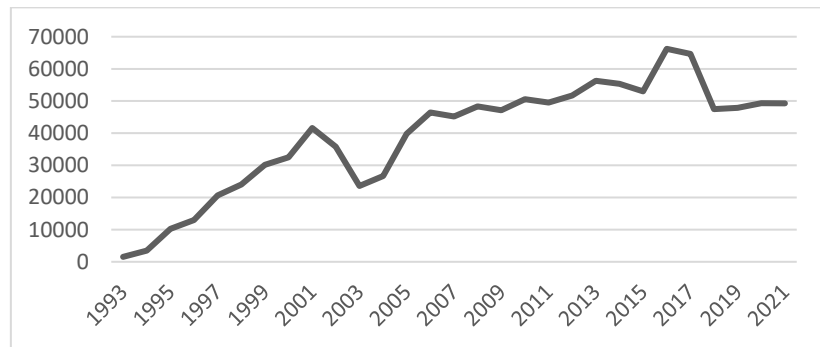


Source: Personal processing from ISO-2021 data

Germany:

Germany is one of the most developed countries in the world in terms of HDI and GDP, which explains the large number of certifications registered each year, as well as the other countries that we have analysed, the evolution of certifications in Germany, is varied between growth and decrease, indeed the strongest growth was recorded in 1995 with a rate of (+195%) is a total number of 10236 certificates. On the other hand, the year 2003 marked the greatest rate of decline in terms of ISO 9001 certifications (-34%).

Figure 5: the evolution of ISO 9001 certification in Germany (1993 – 2021)

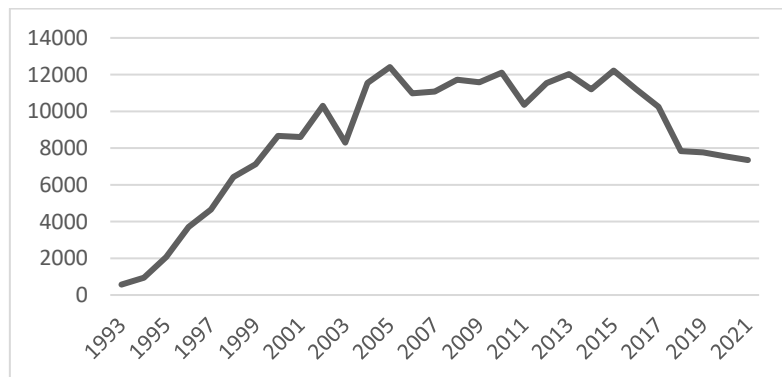


Source: Personal processing from ISO-2021 data

Switzerland:

Switzerland is the 17th world economy with a nominal GDP of 800.6 billion USD in 2021 according to the World Bank, and 1st in terms of the HDI, about the number of certifications varies between 500 and 13000. Figure 6 shows a significant evolution between 1993 and 2002, moreover, in 2003 we notice a fall of (-19%). Thus in 2011 and given the European debt crisis, we see that there was a decrease with a rate of (-14%), however, the country has continuously recorded declines in the number of ISO 9001 certifications in recent years.

Figure 6: the evolution of ISO 9001 certification in Switzerland (1993 – 2021)

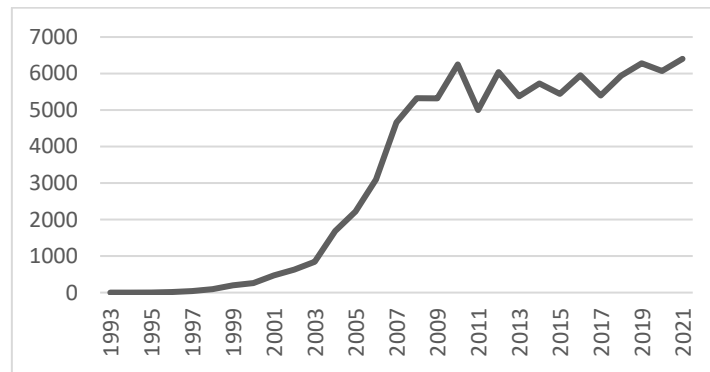


Source: Personal processing from ISO-2021 data

Bulgaria:

Traditionally an agricultural country, Bulgaria is today considerably industrialized. Indeed, its GDP is 84.06 billion USD in 2021, of which the agricultural sector represents 3.4%, so it is considered as a developed country in terms of HDI, which explains the relatively large number of ISO 9001 certifications. According to the results obtained an evolution between 1993 and 2010, after this date, a fall was recorded with a rate of (-20%), and generally from 2012 the evolution is not very considerable and the number of certifications has not evolved a lot.

Figure 7: the evolution of ISO 9001 certification in Bulgaria (1993 – 2021)



Source: Personal processing from ISO-2021 data

From the analysis carried out, we can conclude that there is no clear overall trend of a decrease in the number of certifications in the crisis years, and therefore it does not seem to be a key factor for companies to whether or not to adhere to the certification.

4.2 Comparative analysis between Morocco and other countries

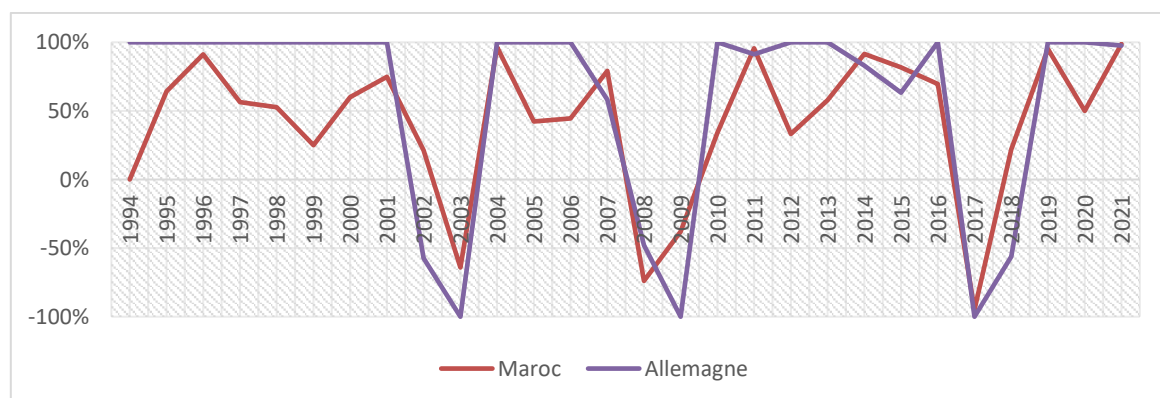
After an individual analysis of each country, we conducted a comparison to determine whether their behaviour was equivalent or very different, despite the differences in development that exist between them.

Morocco VS Germany

Germany is a highly developed country in terms of the HDI compared to Morocco. In this perspective, and based on the data collected from the ISO, we have drawn up a comparative table to visualize the differences in evolution between the two countries, the results obtained are shown in the graph below.

The variations between each year were calculated as a percentage to understand if the behaviour between the two countries was similar.

Figure 8: Comparison between Morocco and Germany



Source: Personal processing from ISO-2021 data

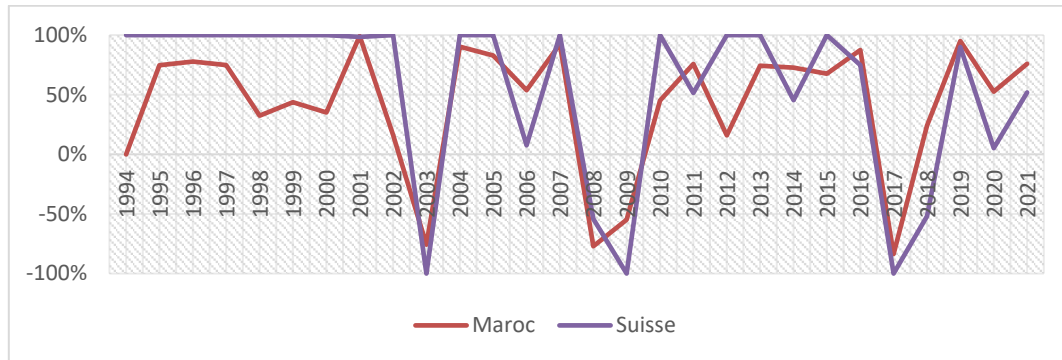
This comparison shows that the difference between the number of certifications in each country is extremely greater in Germany, while the positive and negative movements in the evolution are identical to that of Morocco. Between 2001 and 2003, Germany showed a significant decrease in the number of certifications compared to Morocco, and likewise, between 2006 and 2008, this can be explained by the global financial crisis of 2008. Thus, we see that between 2004 and 2005 there was a decline in Morocco against a growth in Germany, the same between

2011 and 2012, which means that Morocco was impacted by the European debt crisis of 2012 while Germany managed to resist it.

Morocco VS Switzerland

Like Germany, Switzerland is a highly developed country in terms of the human development index compared to Morocco.

Figure 9: Comparison between Morocco and Switzerland



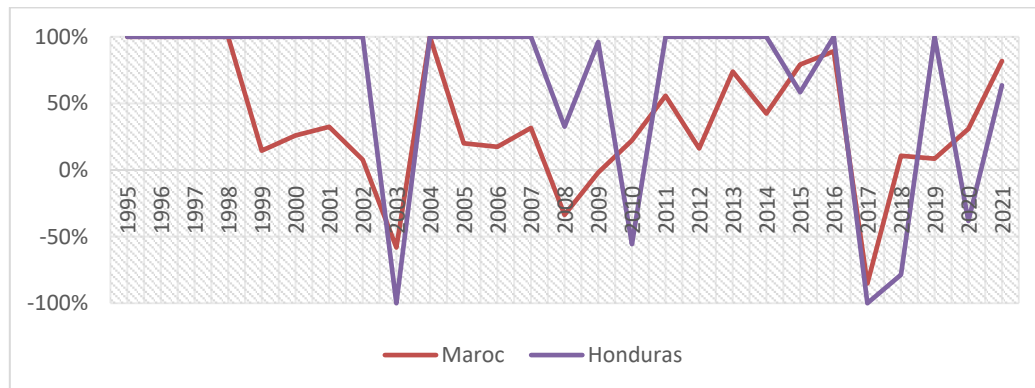
Source: Personal processing from ISO-2021 data

It is visible that the evolutions in the two countries go almost in the same direction, except that Morocco between 1994 and 2001 recorded increases and decreases in the number of ISO 9001 certifications, while in Switzerland the number was in growth, so we see a divergence in the evolution in 2011 where Morocco recorded declines, while the number in Switzerland was growing.

Morocco VS Honduras

Honduras is ranked among the least developed countries in terms of the HDI compared to Morocco.

Figure 10: Comparison between Morocco and Honduras



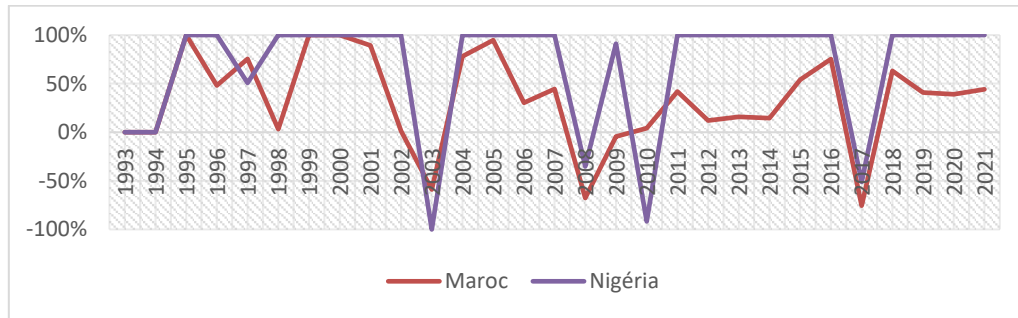
Source: Personal processing from ISO-2021 data

The results obtained show that the evolutions in the two countries are not identical, except that between 2004 and 2005 there was significant growth in Morocco with a rate of (+362%) in 2004, the same for Honduras with a rate of (+144%) in 2005, thus a considerable drop between 2017 and 20018 with (-43%) in Morocco in 2017 and (-62%) in Honduras in 20018.

Morocco VS Nigeria

Morocco and Nigeria are two countries that are part of the same continent. Also, according to the Human Development Index, Morocco ranks higher than Nigeria, while Nigeria's GDP exceeds USD 440.8 billion (2021) and Morocco's reaches USD 142.9 billion. USD (2021).

Figure 11: Comparison between Morocco and Nigeria



Source: Personal processing from ISO-2021 data

Over the years, we note that the evolutions in terms of ISO 9001 certification in the two countries are relatively identical with different growth and decline rates, except that Nigeria recorded a significant decline in 2010 (-87%) and Morocco on the other side recorded an increase of (+3.76%) in the total number of certifications compared to the year 2009.

4.3 Moroccan National Panorama

After analysing the evolution of certification at the national level and comparing it with other countries, it seems very interesting to us to carry out a more specific analysis, the objective of which is to find out which sector will be the most certified in 2021.

From this study, he found that the variability between sectors in terms of ISO 9001:2015 certification is considerable, the results obtained are exposed in Table 2 and Figure 12.

Tableau 2: Number of companies certified in Morocco in 2021 by sector of activity

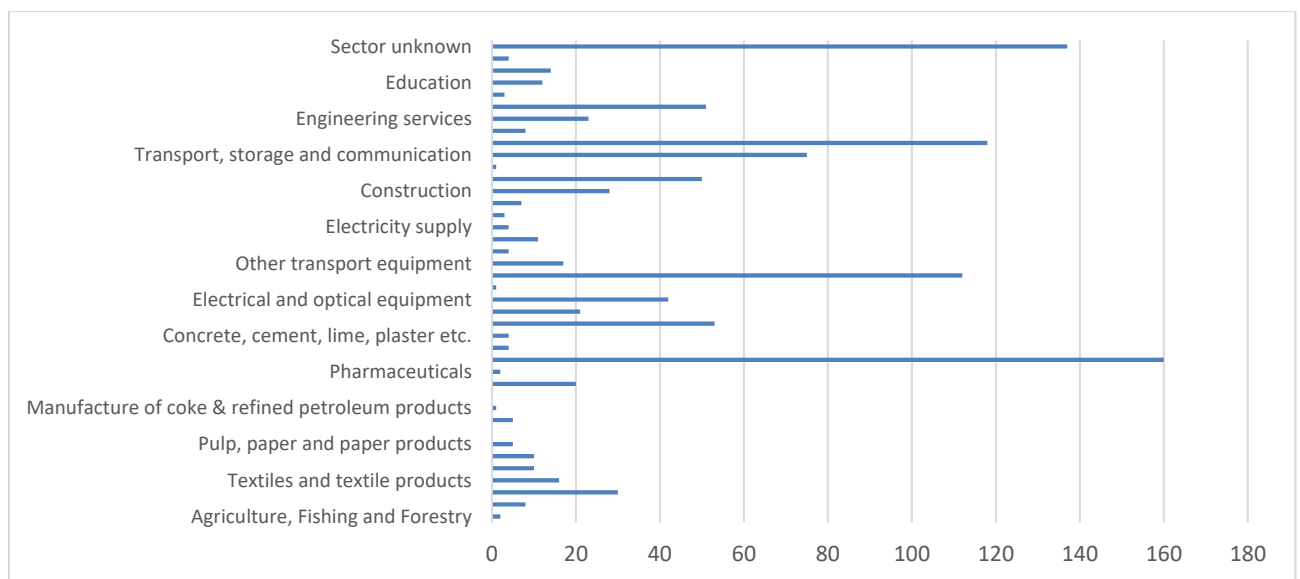
Sector	Number of certified companies
Agriculture, Fishing and Forestry	2
Mining and quarrying	8
Food products, beverages, and tobacco	30
Textiles and textile products	16
Leather and leather products	10
Manufacture of wood and wood products	10
Pulp, paper, and paper products	5
Publishing companies	0
Printing companies	5
Manufacture of coke & refined petroleum products	1
Nuclear fuel	
Chemicals, chemical products & fibers	20
Pharmaceuticals	2
Rubber and plastic products	160
Non-metallic mineral products	4
Concrete, cement, lime, plaster, etc.	4
Basic metal & fabricated metal products	53
Machinery and equipment	21
Electrical and optical equipment	42
Shipbuilding	1
Aerospace	112
Other transport equipment	17
Manufacturing not elsewhere classified	4
Recycling	11
Electricity supply	4
Gas supply	3
Water supply	7
Construction	28
Wholesale & retail trade, repairs of motor vehicles, motorcycles & personal & household goods	50

Hotels and restaurants	1
Transport, storage, and communication	75
Financial intermediation, real estate, renting	118
Information technology	8
Engineering services	23
Other Services	51
Public administration	3
Education	12
Health and social work	14
Other social services	4
Sector unknown	137

Source: ISO-2021

To better visualize the number of certified companies by sector of activity, we have prepared the graph below;

Figure 12: Analysis by business sector in 2021



Source: Personal processing from ISO-2021 data

In 2021 the largest number of certifications was recorded in the plastics and rubber sector with 160 companies, which represents 14% of the total number of certifications recorded in the said year, this can be explained by the strong development experienced by the sector. In the past few years, it is now the second-largest sector in the transformation of the country's chemical industries. In second place are companies from unidentified sectors with 137 certifications. In Morocco, the aerospace industry is undergoing significant growth, boasting one of the most competitive aerospace platforms globally. This clearly explains the number of certifications recorded in 2021, securing the country the 4th position with 112 companies. On the other hand, certain sectors have reported very low numbers in terms of certification. Indeed, Moroccan publishing houses recorded zero certifications in 2021, indicating that the sector did not engage in quality processes during that year.

5. Conclusion

Several conclusions can be drawn from this article. Firstly, as evident throughout our analysis, the implementation of the quality management system by ISO 9001:2015 is acknowledged both at the national and international levels. This practice is adopted by both less developed and highly developed countries, considering their evaluation in terms of GDP and HDI.

In terms of the analysis of evolution by country, we observed that in all the countries studied, the number of ISO 9001-certified companies has shown a gradual increase with slight fluctuations over time. However, recent years have witnessed significant declines or stagnations.

Other aspects to assess included the fact that there were no significant decreases following major disruptive events and economic crises, whether they were global or national. Except in a few specific cases where the decline was neither sustained nor very significant compared to previous years.

The comparative analysis among countries with different development scores has revealed similar trends in evolution, despite variations in the socio-economic conditions of each country. The number of certified businesses during the analysed period was equivalent, with closely coinciding percentages of increase and decrease. An essential point to examine is that Switzerland is a country with unique economic conditions and significantly higher scores, both in terms of GDP and HDI, compared to Morocco. However, the variations and trends are remarkably similar, leading us to conclude that despite economic differences between countries, it is not a key factor for businesses to adopt certification.

Furthermore, we analysed to determine the sector most aligned with ISO 9001 certification in Morocco. Our findings indicate that the plastics and rubber sector hold the top position in 2021, boasting 160 certified companies. The second position is occupied by companies from sectors not identified by ISO, totalling 137 certifications. Following closely, the financial intermediation, real estate, and leasing sectors secure the third position with 118 certifications. Lastly, the aerospace industry takes the fourth spot with 112 certified companies. These analysis results can be elucidated by the number of companies operating in each sector; sectors with high certification numbers encompass a multitude of businesses, while those with low certification figures contain fewer enterprises.

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