

Proposal of a causal model measuring the impact of an ISO 9001 certified Quality Management System on financial performance of Moroccan service-based companies

El Moury Ibtissam¹, Mohamed Hadini², Adil Chebir³
Ben Ali Mohamed⁴, Echchelh Adil⁵

Abstract

Implemented by an increasing number of organisations worldwide, the ISO 9001 standard for quality management received considerable attention in the existing literature. Researchers worldwide have found positive, negative and even mixed effects of ISO 9001 certification on firms' performance, while in Morocco this issue has been rarely examined. It is the combination of these observations that led to this study.

The aim of this paper is to test and validate a causal model designed to measure the performance of an ISO 9001 certified Quality Management System (QMS) and its impact on a company's financial performance. By means of this causal analysis/model, the study examines the relationship between:

- QMS and the financial performance of 41 companies based in Morocco;
- the management responsibility process and all the QMS processes;
- the management resources process and all the QMS processes;
- the organisational and financial performance of the studied companies.

All of the considered firms are part of the service industry and range from medium-sized to large companies.

The data gathered in this study have been instrumental in devising actionable insights. The Statistical Package for the Social Sciences (SPSS) was the statistical software platform that enabled the use of a linear regression analysis to prove the positive correlation between the above-mentioned elements.

Key words: financial performance, organisational performance, Quality Management System (QMS), ISO 9001 certification.

¹ Electronic Systems, Information Processing, Mechanics and Energetics Laboratory, Faculty of Science, Ibn Tofail University, Morocco. E-mail: ibtissamelmoury@gmail.com. ORCID: <https://orcid.org/0009-0000-6175-0380>.

² Mechanics, Production and Industrial Engineering Laboratory, Higher School of Technology, Hassan II University, Casablanca, Morocco. E-mail: mohammed.hadini1@gmail.com.

³ Electronic Systems, Information Processing, Mechanics and Energetics Laboratory, Faculty of Science, Ibn Tofail University, Morocco. E-mail: achebir@gmail.com.

⁴ Mechanics, Production and Industrial Engineering Laboratory, Higher School of Technology, Hassan II University, Casablanca, Morocco. E-mail: benali8mohamed@gmail.com

⁵ Electronic Systems, Information Processing, Mechanics and Energetics Laboratory, Faculty of Science, Ibn Tofail University, Morocco. E-mail: adilechel@gmail.com. ORCID: <https://orcid.org/0000-0002-5302-4255>.



1. Introduction

The service industry is one of the most important components in Morocco's economic performance. It provides jobs and valuable services to the economy and hence supplies a substantial contribution to the national GDP (Gross Domestic Product). It is, therefore, a support sector contributing to national growth, witnessed by the positive correlation between the evolution of overall economic activity and the growth of the sector.

However, this sector remains relatively less developed because of its fragmented structure, its high cost and the shortcomings recorded in terms of organization and management, especially in quality management.

In fact, the Moroccan firm services evolve in an environment characterized by a competitive offer more and more strong, a requirement of competitiveness more and more acute and high customers' expectations. To become and remain competitive in its market, the firm service must establish its brand image and strengthen the reputation of its services. Flexibility, speed, and adaptability are the imperatives that the company should meet, in all circumstances. Therefore, the service provider must master and ensure an efficient quality management and customer satisfaction.

In this context, ISO 9001 certification remains one of the most suitable tools for harmonizing practices and establishing a dynamic of continuous improvement, covering the quality of services of all activities of any organization.

However, the question that is arising is to what extent a quality management system 'QMS' certified ISO 9001 has a positive impact on the performance of the Moroccan firm service, mainly the financial performance, what is the relationship between the latter and organizational performance? And how can this system allow the organization to reach its efficient objectives?

2. Literature Review

2.1. Organizational and Financial Performance

For a long time, performance has been a one-dimensional concept, measured by profit alone, mainly because of the weight of owners in the decision-making process. From this perspective, performance measurement focuses mainly on creating value for shareholders. It is therefore not surprising that corporate management is focused on this value creation and the way to manage it. Recent studies show that 200 companies listed by Fortune magazine currently use an indicator based on the value created for shareholders to evaluate performance (Patrick Jaulient (2012)).

Despite this observation, it should be noted that at this stage this purely financial logic is strongly criticized in the existing literature (Dohou and Berland (2007)), because it does not integrate the various actors who participate in the development of the firm (managers, employees, customers, etc.).

According to Serhan (2019), firm performance entails three areas of the company including product market, shareholder return, and financial performance. The improvement of this performance includes business re-engineering activities, processes for continuously improving the business and the quality of services or products offered. To ensure that the organization is efficient it is necessary to analyse the main performance indicators (Barna and Roxana (2021)).

According to Rashid et al. (2018), firm performance could be categorized into two broad categories, financial and nonfinancial measures. Some researchers used different terms, such as financial and operational performance measures, finance and efficiency and short and long-term measures. Short-term measures are normally based on the financial returns, while long-term measures are normally based on the non-financial returns. In general, financial performance indicators are a set of variables which usually can show the firm's capability in making profits, while non-financial indicators are a set of variables that are not measured by financial systems (Al-Mamar et al. (2020)).

For Zehir et al. (2018), there are two performance classifications which are qualitative and quantitative performance. Qualitative performance is largely related to the culture, environment, human resources, and abstract outputs within the organization and includes criteria such as employee satisfaction, customer satisfaction, quality and innovation performance. Quantitative performance includes criteria such as turnover increase, market share increases and profitability increase, which are partly influenced by qualitative factors and moreover based on marketing and financial management success. Bartoli and Blatrix (2015) believed that the definition of performance should be achieved through items such as piloting, evaluation, efficiency, effectiveness, and quality.

According to Rafoi (2016), a company's performance indicators can be classified as follows:

- Strategic indicators: market share, turnover, customer satisfaction, return (profit).
- Managerial indicators: availability of resources, costs, budget.
- Operational indicators: individual performance, processes performance, products, efficiency.

For Moulai Ali (2012), organizational performance "deals with how the firm is organized to achieve its goals and mainly how to realize them in a good way".

Organizational performance determines the ability of the firm to implement effective processes to reach its operational and strategic projections. The pillars of this efficiency can only be:

- The development and respect of a 'Process' approach.
- The relationships between the pilots of the different departments of the organization.
- The quality of the information flow.
- And the degree of flexibility of the organization.

Regarding the measurement of organizational performance, Berberoglu (2018) suggests that we can measure it by evaluating numerical data, which includes objective and timely information about how the organization is doing. However, performance measurement is not always necessarily based on objective data.

Hadini et al. (2020) concluded that: the theoretical difficulty in defining the concept of performance and that of organizational efficiency means that the use of indicators to measure one or the other of these concepts, depending on the objectives set by the firm, remains the only way to assess the functioning of a firm.

Regarding financial performance, Farrukh et al. (2016) consider it as the extent to which a company financial health over a period is measured. In other words, financial performance is a composite of an organization's financial health, its ability and willingness to meet its long-term financial obligations and its commitments to provide services in the foreseeable future. In a broader sense, financial performance refers to the degree to which financial objectives are accomplished (Ganyam and Ivungu (2019)). Cost-related performance is measured by quantitative indicators such as return on investment and sales, profitability, productivity, return on assets, efficiency, etc.

In the literature, the financial performance is measured based on a variety of indicators, or data issued from financial statements, balance sheets, income statements, statement of cash flows, etc., but can also refer to market data (e.g. market value of the shares). It can be defined by a variety of indicators, such as turnover (sales), return on assets (ROA), return on sales (ROS), return on equity (ROE), return on investment (ROI), earnings per share (EPS), earnings before interest (EBI), tax depreciation and amortization (Matradi and Mounir (2022)).

For a long time, this financial aspect of performance has remained the reference in terms of company performance and evaluation. Even if it facilitates a simple reading of the company's management, this financial dimension alone no longer ensures the company's competitiveness.

2.2. ISO 9001 standard and certification

Every firm must meet the requirements of its stakeholders. The set of political, policies and procedures that allow to satisfy these requirements form what is commonly called a 'Quality Management System (QMS)'.

QMS leads to the control of the processes and the quality of products (or services) which, in turn, allows the satisfaction of the customer and the achievement of the economic objectives that the organization has predicted to be reached (El Moury et al. (2020)).

We should say, to succeed in the business world, building and retaining a customer base is compulsory. In other words, it is necessary to respond in an optimal way to the present expectations of the market as well as to the futures ones, which inevitably passes by the offer of quality services.

A sharp expertise in Quality Management is the tool to succeed in this mission and ISO 9001 is the preferred way to standardize and make a QMS reliable. Thus, alignment with customer and regulatory requirements becomes possible (El Moury et al. (2020)).

Certification also has a word to say in this context. This certification, which translates into the delivery of a written assurance by an external and independent organization, gives the necessary glow to any QMS respecting the ISO 9001 standard.

Indeed, and beyond the fact that it brings a contribution of experienced experts, the certification guarantees to the company a solid reputation and a more preponderant influence. In addition to this, the organization's continuous improvement and better chances to gain market share are guaranteed.

According to Echour and Nbigui (2021), the adoption of ISO 9001 is a voluntary approach, certification is a fashion effect for companies that want to be recognized for their quality and resist in an increasingly competitive market.

For Isuf et al. (2016), ISO 9001 standards do not refer to the compliance with a given goal or result. In other words, they are not performance standards measuring the quality of a firm's products or services or a firm's environmental results, rather, they are standards setting out the need to systematize and formalize many corporate processes within a set of procedures, and to document such implementation.

International Organization for Standardization 'ISO' is an independent, non-governmental international organization, bringing together experts to share knowledge to develop consensus-based, market-relevant, voluntary international standards, which support innovation and provide solutions to global challenges.

In its ISO/IEC guide, ISO defines a standard as "a document established by consensus and approved by a recognized body, which provides, for common and

repeated use, rules, guidelines or characteristics for activities or their results that ensure an optimum level of order in a given context".

ISO defines certification as follows: 'Procedure by which a third party gives written assurance that a product, process or service conforms to the requirements specified in a standard'. Thus, the ISO 9001 certification certifies that an organization has a management system that complies with the ISO 9001 standard. Note that the other standards of the 9000 series: vocabulary (ISO 9000), guidelines (ISO 9004), do not contain requirements and cannot be used as a basis for certification.

3. Research Methodology

The objective of this research work is to test and validate a conceptual model (causal) allowing to measure the impact of:

- The processes of quality management system an 'ISO 9001 certified' on financial performance.
- Organizational performance on financial performance.
- Management Responsibility Processes on these three processes: Service Realization Process 'SRP', Measurement, Analysis, and Improvement Process 'MAIP' and Resource Management Process 'RMP' .
- The Resource Management process on the Service Realization process 'SRP' and the Measurement, Analysis, and Improvement process 'MAIP'.

Using the method of linear regression by SPSS software on a sample of 41 questionnaires administered face to face to directors and quality managers of Moroccan firms, certified ISO 9001, in the service sector (banking, transport, trade ...)

3.1. Research model constructs definitions

Our model is composed of two major constructs:

- The processes of an ISO 9001 certified quality management system.
- Organizational and financial performance.

3.1.1. First research construct: Processes of an ISO 9001 certified QMS

A quality management system (QMS) is the set of activities by which the organization defines, implements, and reviews its quality policy and objectives in accordance with its strategy. An organization's QMS is made up of interrelated and interactive processes that use resources to achieve intended results and deliver value (product, service, etc.). The QMS processes form our first research construct:

- Management Responsibility Process: MRP;

- Service Realization Process: SRP;
- Measurement, Analysis, and Improvement Process: MAIP;
- Resource Management Process: RMP.

3.1.2 Second research construct: Performance of the firm

- Organizational performance: OP;
- Financial performance: FP.

3.2. Presentation of the research model

Our model is based on 6 criteria, which are divided into 2 families: 4 criteria refer to the means (QMS process), the other criteria refer to the results (financial and organizational performance) (Figure 1).

We assume that there is a causal relationship between the criteria of means and the criteria of results. In other words, the means in place are the causes of the given results. It should be noted that for each causal relationship a hypothesis has been formulated. Since the proposed conceptual model has 10 causal relationships, 10 hypotheses have been formulated.

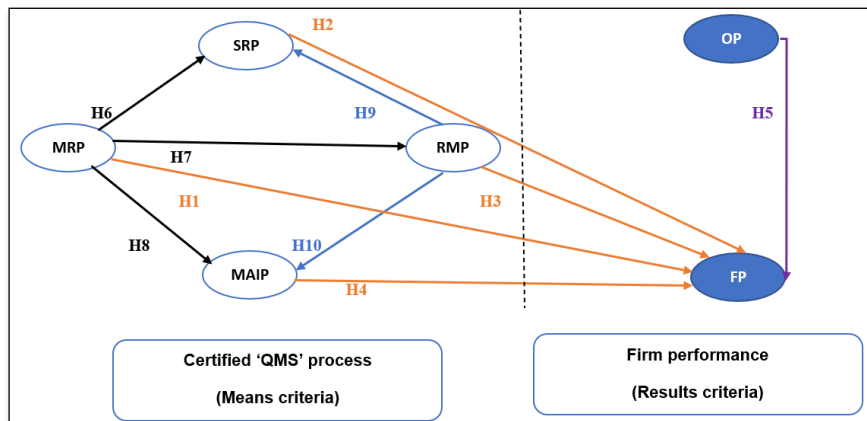


Figure 1: The Proposed Model

Table 1: Showing the codes used in the causal model

Model construct proposed	Code	Title
Certified 'QMS' process (Means criteria)	MRP	Management Responsibility Process
	SRP	Service Realization Process
	MAIP	Measurement, Analysis, and Improvement Process
	RMP	Resource Management Process
Firm performance (Results criteria)	OP	Organizational performance
	FP	Financial performance

3.3. Formulated hypotheses

We intend through our study to validate or invalidate the Ten Hypotheses below:

Table 2: List of hypotheses

Hypothesis Number	Causal Relationship	Hypothesis Formulated
H1	MRP→FP	We suppose that MRP has a strong impact on FP
H2	SRP→FP	We suppose that SRP has a strong impact on FP
H3	RMP→FP	We suppose that RMP has a strong impact on FP
H4	MAIP→FP	We suppose that MAIP has a strong impact on FP
H5	OP→FP	We suppose that OP has a strong impact on FP
H6	MRP→SRP	We suppose that MRP has a strong impact on SRP
H7	MRP→RMP	We suppose that MRP has a strong impact on RMP
H8	MRP→MAIP	We suppose that MRP has a strong impact on MAIP
H9	RMP→SRP	We suppose that RMP has a strong impact on SRP
H10	RMP→MAIP	We suppose that RMP has a strong impact on MAIP

3.4. Qualitative and quantitative study

Before writing our questionnaires, we collected primary data from a qualitative study. The purpose of this phase was to identify the main benefits of certification for the company. Once collected, the material – entirely transcribed – was used for a thematic content analysis.

We chose to conduct a study of managers' perception of the benefits of certification, by administering a questionnaire. The questionnaire was structured in distinct questions operationalizing the different themes emerging from the qualitative study.

3.5. Data Collection

Our study is empirical, and the collection of information is conducted by a questionnaire. This latter is divided into four parts:

- **Part One**, including information such as the name, the firm size and the type of service provided by the latter, in addition to the motivation for the implementation of a QMS certified ISO 9001.
- **Part Two** is used to collect information allowing to test the causal relationship between the various processes of the Certified ISO 9001 QMS.
- **Parts Three and Four** are used to collect information allowing to test the strength and the sense of the various causal relationship, which can exist between the impact of the ISO 9001 certification and the axes relating to the organizational and financial performance.

To implement our measurement instrument, we use Churchill's [1979] best-known paradigm. This paradigm is mostly used by most researchers to develop their own measurement scales rather than using the instruments that already exist, Legardinier (2013).

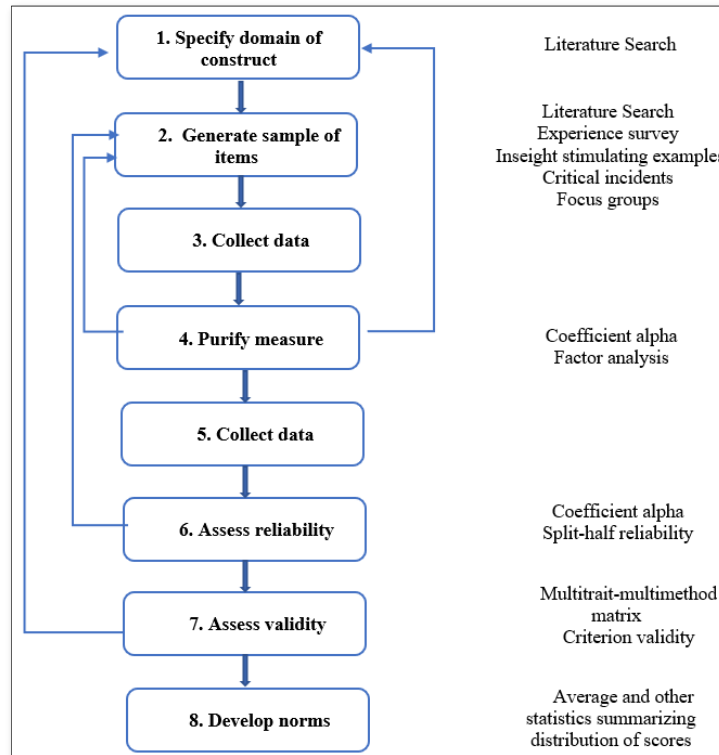


Figure 2: The Churchill Paradigm Approach [1979]

3.6. Established measurement scales

To provide a measure for all the criteria of the designed model, we opted for the Likert scale, as it is considered the most known, the most appropriate for opinion studies and for sure the most used (Evrard et al. (2003)).

The questionnaire items are collected on the 5 point Likert scales: (Strongly disagree, somewhat disagree, moderately agree, somewhat agree, strongly agree). Note that the total number of items is 50 (items/questions).

3.7. Reliability test

The reliability of measurements is concerned with the reduction of the random part of the measurement error: if the same phenomenon is measured several times by the same measuring instruments, the results should be as close as possible.

For this reason, we will use Cronbach's alpha index. This index allows us to study the internal consistency between the set of items for each latent variable, that is, it allows us to measure the reliability of the measurements of a set of questions (or items) intended to measure a specific phenomenon (the answers to questions on the same subject must be correlated so that all the interviewees or respondents must have the same understanding of each separate question).

3.8. Testing the reliability of the two research constructs

From the results in Table 3, we can conclude that all values exceed 0.7. This shows that the items composing the two constructs have a good internal consistency.

Table 3: Reliability analysis of the two research constructs

Criteria	Variables	Code	Alpha value Cronbach	Number of items
Means criteria	Management Responsibility Process	MRP	0.939	9
	Service Realization Process	SRP	0.829	6
	Measurement, Analysis, and Improvement Process	MAIP	0.920	11
	Resource Management Process	RMP	0.849	6
Results criteria	Organizational performance	OP	0.923	9
	Financial performance	FP	0.842	6

4. Results of the empirical research

In this part we present the results of our empirical study

4.8. Measuring the relationship between QMS criteria factors and financial performance

4.8.1. Overall Model: QMS Processes (MRP, SRP, MAIP, RMP) – Financial Performance 'FP'

According to Table 4, we observe that the strength of the relationship between the QMS criteria factors and Financial Performance is quite strong in a positive way ($R=0.615$). The QMS factors explain 26.5% of the financial performance (adjusted R -squared=0.265). Overall, the model is valid (significance=0.028<5%, Table 5).

Table 4: Summary of overall model (QMS process-FP)

Model	R	R-squared	Adjusted R-squared	Standard error of estimation
1	0.615	0.378	0.265	0.83993530

- a. Predicted values: MRP, SRP, MAIP, RMP
- b. For regression at the origin (model without constant). R-squared measures the proportion of variability in the dependent variable around the origin determined by regression. This cannot compare to R-squared for models that include a constant.
- c. Dependent variable: FP
- d. Linear regression at the origin

Table 5: Analysis of variance (QMS process-FP)

Model	Sum of squares	ddl	Average square	D	Sig
Regression	9.423	4	2.356	3.339	0.028
Residual	15.521	22	0.705		
Total	24.943	26			

- a. Dependent variable : FP
- b. Linear regression at the origin
- c. Predicted values: MRP, SRP, MAIP; RMP
- d. This total of squares is not corrected for the constant because the constant is zero for the regression at the origin.

4.8.2. Regression Equation: QMS Process - Financial Performance

Based on Table 6, the linear regression equation can be written as follows:

$$FP = 0.662 MRP - 0.260SRP + 0.297 RMP - 0.114 MAIP$$

Note that the significances for SRP, RMP, MAIP are invalid (sig.>5%). But this is not the case for MRP. Therefore, the relationship between FP and MRP is significant.

Table 6 : Criteria Coefficients (QMS-FP)

Model	Unstandardized coefficients		Standardized coefficients	t-student	Sig.(P-value)
	A	Standard error	Beta		
MRP	0.662	0.296	0.663	2.233	0.036
SRP	-0.260	0.326	-0.261	-0.796	0.435
RMP	0.297	0.401	0.275	0.741	0.467
MAIP	-0.114	0.359	-0.097	-0.317	0.754

4.9. Measuring the relationship between organizational performance and financial performance

4.9.1. Overall Model: (OP-FP)

Generally, the strength of the relationship between organizational performance and financial performance is quite high ($R=0.704$). The variable to be explained (PE) explains 49.5% of the predicted variable PO ($R\text{-squared}=0.495$). Also, the significance value of the model is lower than 5%. Therefore, the model is globally valid.

Table 7: Summary of global model (OP-FP)

Model	R	R-squared	Adjusted R-squared	Standard error of estimation
	0.704	0.495	0.483	0.71032858

- Predicted values: OP
- For regression at the origin (model without constant). R-squared measures the proportion of variability in the dependent variable around the origin determined by regression. This cannot compare to R-squared for models that include a constant.
- Dependent variable: FP
- Linear regression at the origin

Table 8: Analysis of variance (OP-FP)

Model	Sum of squares	ddl	Average square	D	Sig
Regression	19.817	1	19.817	39.276	0.000
Residual	20.183	40	0.505		
Total	40.000	41			

- Dependent variable : FP
- Linear regression at the origin
- Predicted value: OP
- This total of squares is not corrected for the constant because the constant is zero for the regression at the origin.

4.9.2. Regression equation (OP-FP)

Based on Table 9, the linear regression equation can be written as follows:

$$FP = 0.704 OP$$

The significance of the OP-FP causal relationship is significant ($Sig=0 < 5\%$), we can conclude that OP strongly impacts FP.

Table 9: Criteria Coefficients (OP-FP)

Model	Unstandardized coefficients		Standardized coefficients	t-student	Sig. (P-value)
	A	Standard error	Beta		
OP	0.704	0.112	0.704	6.267	0.00

4.10. Measuring the relationship between the Management Responsibility Process 'MRP' and the Service Realization Process 'SRP'

4.10.1. Global Model (MRP-SRP)

There is thus a quite strong relationship between SRP and MRP (R=0.783). The dependent variable SRP explains 61.4% of the relative independent variable MRP. (Table 10). The significance is less than 5%. This proves the validity of the overall model. (Table 11).

Table 10: Summary of global model MRP-SRP

Model	R	R-squared	Adjusted R-squared	Standard error of estimation
	0.783	0.614	0.598	0.62409402

- a. Predicted value: MRP
- b. For regression at the origin (model without constant). R-squared measures the proportion of variability in the dependent variable around the origin determined by regression. This cannot compare to R-squared for models that include a constant.
- c. Dependent variable: SRP
- d. Linear regression at the origin.

Table 11: Analysis of variance MRP-SRP

Model	Sum of squares	ddl	Average square	D	Sig
Regression	15.476	1	15.476	39.734	0.000
Residual	9.737	25	0.389		
Total	25.213	26			

- a. Dependent variable : MRP
- b. Linear regression at the origin
- c. Predicted value: SRP
- d. This total of squares is not corrected for the constant because the constant is zero for the regression at the origin.

4.10.2. Regression equation (MRP-SRP)

The linear regression equation can be written as follows: **SRP= 0.787 MRP**. Also, the causal relationship is significant (<5%).

Table 12: Criteria Coefficients (MRP-SRP)

Model	Unstandardized coefficients		Standardized coefficients	t-student	Sig.(P-value)
	A	Standard error	Beta		
MRP	0.787	0.125	0.783	6.303	0.00

- Dependent variable: SRP
- Linear regression at the origin

4.11. Measuring the relationship between the Management Responsibility Process and the Resource Management Process (MRP--->RMP)

4.11.1. Global Model (MRP-RMP)

There is thus a quite strong relationship between RMP and MRP ($R=0.757$). The significance is less than 5%. This proves the validity of the overall model.

Table 13: Summary of global model (MRP-RMP)

Model	R	R-squared	Adjusted R-squared	Standard error of estimation
	0.757	0.573	0.556	0.60426602

- Predicted value: MRP
- For regression at the origin (model without constant), R-squared measures the proportion of variability in the dependent variable around the origin determined by regression. This cannot compare to R-squared for models that include a constant.
- Dependent variable: RMP
- Linear regression at the origin.

Table 14: Analysis of variance (MRP-RMP)

Model	Sum of squares	ddl	Average square	D	Sig
Regression	12.249	1	12.249	33.547	0.000
Residual	9.128	25	0.365		
Total	21.378	26			

- Dependent variable : RMP
- Linear regression at the origin
- Predicted value: MRP
- This total of squares is not corrected for the constant because the constant is zero for the regression at the origin.

4.11.2. Regression Equation (MRP-RMP):

The linear regression equation can be written as follows: **RMP= 0.7 MRP.**

Also, the causal relationship is significant (<5%).

Table 15: Criteria Coefficients (MRP-RMP)

Model	Unstandardized coefficients		Standardized coefficients	t-student	Sig. (P-value)
	A	Standard error	Beta		
MRP	0.700	0.121	0.757	5.792	0.00

4.12. Measuring the Relationship between the Management Responsibility Process and the Measurement, Analysis and Improvement Process

4.12.1. Global Model (MRP-MAIP):

There is thus a quite strong relationship between MAIP and MRP (R=0.725). The dependent variable MAIP explains 52.6% of the relative independent variable MRP. The significance is less than 5%. This proves the validity of the overall model.

Table 16: Summary of global model (MRP-MAIP)

Model	R	R-squared	Adjusted R-squared	Standard error of estimation
	0.725	0.526	0.507	0.58705996

- a. Predicted value: MRP
- b. For regression at the origin (model without constant). R-squared measures the proportion of variability in the dependent variable around the origin determined by regression. This cannot compare to R-squared for models that include a constant.
- c. Dependent variable: MAIP
- d. Linear regression at the origin

Table 17: Analysis of variance (MRP-MAIP)

Model	Sum of squares	ddl	Average square	D	Sig
Regression	9.553	1	9.553	27.720	0.000
Residual	8.616	25	0.345		
Total	18.169	26			

- a. Dependent variable : MAIP
- b. Linear regression at the origin
- c. Predicted value: MRP
- d. This total of squares is not corrected for the constant because the constant is zero for the regression at the origin.

4.12.2. Regression equation (MRP-MAIP)

The linear regression equation can be written as follows: MAIP= 0.618 MRP.

Also, the causal relationship is significant (<5%).

Table 18: Criteria Coefficients (MRP-MAIP)

Model	Unstandardized coefficients		Standardized coefficients	t-student	Sig. (P-value)
	A	Standard error	Beta		
MRP	0.618	0.117	0.725	5.265	0.00

4.13. Measuring the relationship between the Resource Management Process and the Service Realization Process (RMP--->SRP)

4.13.1. Overall Model RMP--->SRP

There is thus a quite strong relationship between SRP and RMP (R=0.834). The dependent variable SRP explains 69.5% of the independent variable RMP. The significance is less than 5%. This proves the validity of the overall model.

Table 19: Summary of global model (RMP-SRP)

Model	R	R-squared	Adjusted R-squared	Standard error of estimation
	0.834	0.695	0.688	0.55200219

- Predicted value: SRP
- For regression at the origin (model without constant). R-squared measures the proportion of variability in the dependent variable around the origin determined by regression. This cannot compare to R-squared for models that include a constant.
- Dependent variable: RMP
- Linear regression at the origin.

Table 20: Analysis of variance (RMP-SRP)

Model	Sum of squares	ddl	Average square	D	Sig
Regression	27.812	1	27.812	91.274	0.000
Residual	12.188	40	0.305		
Total	40.000	41			

- Dependent variable : RMP
- Linear regression at the origin
- Predicted values: SRP
- This total of squares is not corrected for the constant because the constant is zero for the regression at the origin.

4.13.2. Regression equation (RMP-SRP)

Referring to Table 21, the linear regression equation can be written as follows: **SRP= 0.834 RMP**. Also, the causal relationship is significant (<5%).

Table 21: Criteria Coefficients (RMP-SRP)

Model	Unstandardized coefficients		Standardized coefficients	t-student	Sig.(P-value)
	A	Standard error	Beta		
SRP	0.834	0.087	0.834	9.554	0.00

4.14. Measuring the Relationship between the Resource Management Process and the Measurement, Analysis, and Improvement Process (RMP--->MAIP)

4.14.1. Global Model: RMP-MAIP

Similarly, overall, there is a strong relationship between RMP and MAIP (R=0.872). The dependent variable MAIP explains 76.1% of the relative independent variable RMP. The significance is less than 5%. This proves the validity of the overall model.

Table 22: Summary of global model (RMP-MAIP)

Model	R	R-squared	Adjusted R-squared	Standard error of estimation
	0.872	0.761	0.755	0.48903625

- a. Predicted value: RMP
- b. For regression at the origin (model without constant). R-squared measures the proportion of variability in the dependent variable around the origin determined by regression. This cannot compare to R-squared for models that include a constant.
- c. Dependent variable: MAIP
- d. Linear regression at the origin.**

Table 23: Analysis of variance (RMP-MAIP)

Model	Sum of squares	ddl	Average square	D	Sig
Regression	30.434	1	30.434	127.255	0.000
Residual	9.566	40	0.239		
Total	40.000	41			

- a. Dependent variable : MAIP
- b. Linear regression at the origin
- c. Predicted values: RMP
- d. This total of squares is not corrected for the constant because the constant is zero for the regression at the origin.

4.14.2. Regression Equation RMP-MAIP

The linear regression equation can be written as follows: MAIP= 0.872 RMP. Also, the causal relationship is significant (Sig <5%).

Table 24: Criteria Coefficients (RMP-MAIP)

Model	Unstandardized coefficients		Standardized coefficients	t-student	Sig. (P-value)
	A	Standard error	Beta		
RMP	0.872	0.077	0.872	11.281	0.00

4.15. Global model with the results and hypothesis testing results

The global model with the results and hypothesis testing results are presented as follows:

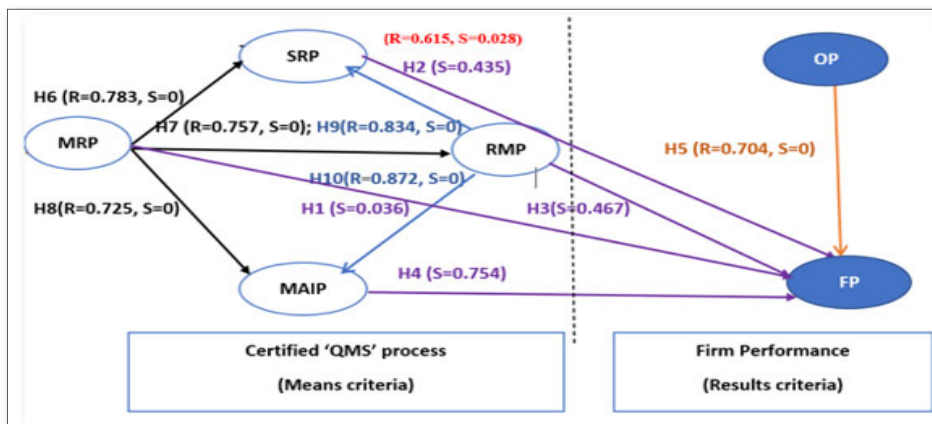


Figure 3: Global model with results

Table 25: Hypothesis Testing Results

Hypotheses	Results
H1: MRP→FP	Valid
H2: SRP→FP	Invalid
H3 : RMP→FP	Invalid
H4 : MAIP→FP	Invalid
H5 : OP→FP	Valid
H6 : MRP→SRP	Valid
H7 : MRP→RMP	Valid
H8 : MRP→MAIP	Valid
H9 : RMP→SRP	Valid
H10 : RMP→MAIP	Valid

5. Discussion and conclusion

Firms put in mind their concern for maximizing yield, so it is very important to analyse the impact of an ISO 9001 certified QMS on the firm's financial results.

Otieno and Kithae (2021) assessed the effect of the implementation of ISO 9001 quality management system on the financial performance of SMEs in Kenya. The upshot of these studies concluded that the implementation of this system has statistically no significant effect on the financial performance of these firms. Also, Islam et al. (2015) and Zondo (2018) confirm that there is no significant relationship between these two elements.

In a business environment where an economic downturn and financial crisis dominates (Greece to be precise). Evangelos and Dimitrios (2014) concluded that the ISO 9001 certified manufacturing companies significantly outperform the non-certified regarding product quality, customer satisfaction, operational, market and financial performance. Also, Matheus et al. (2021) proved that ISO 9001 certification has a positive impact on the financial performance of several Brazilian companies. Furthermore, an in-depth analysis of 92 studies shows that the ISO 9001 certification helps companies to increase their income and financial performance (Basak et al. (2018)). Always in the same context the results of several research show that there is a positive relationship between the quality management system implementation and the financial performance (Astrini, 2021; Ionaşcu et al., 2017; Jalil et al., 2017).

In Iceland, the study of Hróbjartsson (2012) was in a comparative perspective between ISO 9001 certified firms and those that are not. The result of this work justified the remarkable difference in financial performance on behalf of companies holding ISO 9001 certification. Also, Valmohammadi & Kalantari (2015) confirm the same finding: the ISO 9001 certified companies have a more relevant performance than companies not certified.

The effect of ISO 9001 standards on financial performance continued to attract the attention of Nguyen et al. (2016) in Vietnam, whose results confirmed the causal relationship between these two concepts. In the United States of America, the research of Awoku (2012) argued the feasibility of this version of the ISO 9001 international standard as a determinant of financial performance and supplier selection.

In Pakistan, the findings of the research work of Faryal et al. (2019) suggest that QMS certified ISO 9001 implementation has a significant and positive role in improving innovation and financial performance of the manufacturing organizations.

With regard to the kingdom of Morocco, and from an economic environment perspective, Ben Ali (2016) measured the impact of an ISO 9001 certified quality approach (case: young manufacturing companies in growth phase, located in the north of Morocco) on the firm's overall performance, including financial performance, the results showed that there is a positive relationship between these two elements.

Also, Belkasseh (2019) affirm the positive effect of ISO registration on the financial performance. However, Hadini (2020) proved that the practices of an ISO 9001 certified quality approach (case: multinational firm located in Morocco) have a weak impact on the axes of financial performance.

Based on a large sample of certified firms (21,482 ISO 9000 certifications issued in the United States), Corbett et al. (2005) reported a positive influence of certification on financial performance. Specifically, the firms that experienced a deterioration in financial performance were those that did not seek certification. While Sharma (2005) confirms the same influence, Martynez-Costa and Martynez-Lorente (2007) display an opposite opinion by showing that certification produces a negative effect on financial performance.

According to Coffey et al. (2011), the deployment of the quality management principles of the ISO 9001 international standard has a positive and significant impact on product and service quality, increased sales and market share, profitability, product sustainability and employee satisfaction.

Matradi and Mounir (2022), conducted a review of the literature regarding the effects of an ISO 9001 certified QMS on financial performance, the results of their study show that: some works attempted to show a positive effect (56%), when others showed a negative effect (10%). Some authors report neutral or mediated impact (15%). However, many authors do not confirm it (19%).

According to our exploratory study, the results show that:

- The strength of the relationship between the factors QMS criteria, ISO 9001 certified and financial performance is positive and quite strong.
- The criterion 'Management responsibility' positively influences the financial performance.
- The relationship between the 'Service realization' criterion and financial performance is invalid: this result highlights the fact that although ISO 9001 standards have been integrated, their manifestation in the service realization process does not seem to be visible to managers.
- The relationship between the criterion 'Resource management' and financial performance is invalid, we can interpret this result as follows: An ISO 9001 certification can only be beneficial if the leadership of the organization invests in the quality of resources (human resources in particular) with the mission of managing the pre and post certification.
- The relationship between the criterion 'Measurement, analysis and improvement' and financial performance is invalid, this result is fairly revealing: the audit of a certified QMS is a pillar of success. Indeed, if the leadership of the organization does not give much importance to the measurement and continuous improvement of its certified QMS, there can be little economic benefit from an ISO 9001 certification.

- Organizational performance has a positive and fairly strong influence on financial performance.

According to Ataseven et al. (2015), managers must invest their efforts in the proper integration of the requirements of the ISO 9001 international standard and not in obtaining certification. And Jang and Lin (2008) confirm that thorough QMS implementation significantly determines financial performance.

The efficiency of the management responsibility process within a firm results from:

- A clear dissemination of the principles of its mission, vision, values, and ethics.
- Disseminating to its team the knowledge to be put into practice to improve the implementation and the quality of the services rendered to clients and other interested parties.

The criterion of Management Responsibility aims at assessing the action of the leaders and the excellence of their behaviour, in the accomplishment of their mission, as well as their vision of the organization through the implementation of values and systems necessary for sustainable success. In accordance with the research of Calvo-Mora et al. (2005), this criterion has effects on the criteria of resource and process management.

Thus, the results of our study prove that this criterion positively influences in a fairly strong way the criteria: 'Service realization', 'Resource management' and 'Measurement, analysis and improvement'.

In consideration of the analysis of the observations made by the authors mentioned above and the results of our study, we realize that the commitment of the leaders to manage the processes of the ISO 9001 certified QMS in an efficient way must be visible, permanent, "proactive" and exist at all levels of management, and to enhance firm's performance it is important for management to understand and find different sources of leadership that will lead to improved organizational performance (Uhl-Bien et al. (2014)).

"ISO 9001 standards consider that a management system consists of interacting processes. All processes need, to function, planning, information, resources, evaluation and monitoring, improvements, and decisions internal to the process or provided by other processes such as support processes, management processes and implementation processes. These different processes are linked and influence each other". According to our empirical study we have proven that the process 'Resource Management' does indeed influence positively and strongly all processes of the QMS.

Finally, it should be noted that any research work such as ours has certain limitations for different reasons. For example, the method of data collection by means of a questionnaire is not free of limitations. It only allows for the collection of subjective data and information (perceptions of managers).

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