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FOREWORD

The International Journal on Optimization and Applications (IJOA) is an open access, double blind peer-reviewed online journal aiming at publishing high-quality research in all areas of : Applied mathematics, Engineering science, Artificial intelligence, Numerical Methods, Embedded Systems, Electric, Electronic engineering, Telecommunication Engineering... the IJOA begins its publication from 2021. This journal is enriched by very important special manuscripts that deal with problems using the latest methods of optimization. It aims to develop new ideas and collaborations, to be aware of the latest search trends in the optimization techniques and their applications in the various fields..

Finally, I would like to thank all participants who have contributed to the achievement of this journal and in particular the authors who have greatly enriched it with their performing articles.

Prof. Dr. Hanaa HACHIMI
Editor in chief
Full Professor in Applied Mathematics & Computer Science
National School of Applied Sciences, Ibn Tofail University

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Examining the Robustness of Factorial Techniques applied to Survey data

1$^{\text{st}}$ Hind Bourass
FSJES Agdal
Mohammed V University
Rabat, Morocco
bourasshind1@gmail.com

2$^{\text{nd}}$ Outmane Soussi Noufail
FSJES Salé
Mohammed V University
Rabat, Morocco
n.soussi@um5r.ac.ma
0000-0002-0269-7935

Abstract—This article delves into the use of factor analysis with survey data, highlighting its robustness under diverse conditions unique to survey research. It investigates the performance of these techniques in practical scenarios, especially when confronted with challenges, aiming to ascertain their ability to consistently and accurately analyze survey data, despite its complexity. This study seeks to enhance the practical application of these methods and guarantee meaningful outcomes. Additionally, it addresses the critical aspect of the reliability of measurement instruments in this context.

Index Terms—Cronbach's alpha coefficient, PCA, Bartlett test, KMO test

I. Introduction

Factor analysis is a valuable tool for uncovering the underlying structures of multidimensional survey data. Yet, ensuring the reliability of results hinges on the robustness of these techniques under diverse conditions, including outliers, missing data, or non-normal distributions. This article investigates the robustness of factor analysis in survey data analysis, evaluating its performance with real-world data that frequently present challenges. By assessing these techniques' capability to handle survey data accurately and consistently amid these complexities, we seek to elucidate their practical utility and provide guidelines for reliable and meaningful analyses.

II. The reliability of measuring instruments

Assessing internal consistency aims to enhance data quality by identifying the most representative elements of the studied concepts. This evaluation occurs in two stages:

1) Calculating Cronbach's alpha coefficient allows for the measurement of internal consistency within a set of measurement indicators. This value evaluates the extent to which an item can compromise the overall consistency of a composite scale.
2) Removing items that weaken Cronbach's alpha coefficient by adhering to a predefined decision rule.

This process aims to enhance the reliability of survey measures by eliminating elements that could compromise the overall consistency of the data.

Cronbach's alpha is thus a measure of the internal consistency of a measurement scale, commonly employed in psychometrics.

$$\alpha = \frac{N}{N-1}\left(1 - \frac{\sum_{i=1}^{n}\sigma_{ik}^2}{\sigma_T^2}\right) \qquad (1)$$

With:
- α is the Cronbach's alpha coefficient,
- N is the number of elements (observations) in the scale,
- k is the number of elements in the scale (i.e., the number of questions or items in the questionnaire),
- σ_i^2 is the variance of each individual item, and
- σ_T^2 is the total variance of the set of item scores.

Cronbach's alpha is often used as a preliminary step before conducting factor analysis. While it's not a perfect conceptual fit, alpha is sometimes interpreted as the average correlation among all possible pairs of items within a group. A high alpha value suggests strong internal correlation among items and is typically used as a criterion to determine if further factor analysis is justified. This measure is critical for evaluating the internal consistency of items in a dataset, aiding in the decision of whether factor analysis is appropriate for exploring the data's underlying structures.

For instance, imagine you have an 11-question questionnaire designed to gauge customer satisfaction with a product. You've gathered responses from 12 customers to these questions. These responses, detailed in the database provided in Appendix 1, form the foundation for assessing customer satisfaction with the product.

The table (database) can be represented schematically as follows:

$$\begin{pmatrix} x_{11} & x_{12} & \cdots & x_{1k} \\ x_{21} & x_{22} & \cdots & x_{2k} \\ \vdots & \ddots & & \\ & & \ddots & \\ x_{N1} & x_{N2} & \cdots & x_{Nk} \end{pmatrix} \qquad (2)$$

We are dealing with a variable[1] that is measured through a series of questions, specifically 11 items, which together form a measurement scale for this latent variable. Thus:

---
[1]Not directly observed

- $N = 12$ represents the total number of observations, i.e., the number of customers who responded to the questionnaire.
- $k = 11$ corresponds to the number of items in the measurement scale, each contributing to assessing the latent variable.
- σ_{ik}^2 represents the variance of each item; with $k = 11$, we need to calculate 11 individual variances to assess the dispersion of responses for each question.
- σ_T^2 represents the total variance, i.e., the variance of the cumulative item scores. In this case, we have a single variance to calculate to evaluate the overall dispersion of responses across all the items on the measurement scale.

To calculate individual variances, we use the command: (Excel : =VAR.P(plage))

$$\boxed{\sigma_{ik}^2 = \frac{\sum_{i=1}^{N}(x_{ik} - \bar{x_k})^2}{N}} \tag{3}$$

1) For example for $k = 1$:

$$\sigma_{i1}^2 = \frac{\sum_{i=1}^{12}(x_{i1} - \bar{x_1})^2}{N} = 0,139$$

2) Calculation of the sum of individual variances gives:

$$\sum_{i=1}^{n}\sigma_{ik}^2 = 2.1458 \approx 2.15$$

3) Calculation of score variance

$$\boxed{\sigma_T^2 = \frac{1}{n}\sum_{i=1}^{n}(y_i - \bar{y})^2} = 6.521 \approx 6.52 \tag{4}$$

With y_i is the sum of the responses of individual i

4) Calculating the alpha gives:

$$\alpha = \frac{11}{11 - 1}\left(1 - \frac{2.15}{6.52}\right) = 0.738 \boxed{\approx 0.74}$$

To evaluate the internal consistency of the latent variable measurement scale, the Cronbach's alpha parameter is used, where $0 < \alpha < 1$.

We apply the following **decision rule**:

Cronbach's alpha value	$\alpha > 0.8$	$0.6 < \alpha < 0.8$	$\alpha < 0.6$
Consistency	High	Moderately	Weakly
Decision	Acceptable	Acceptable	Unacceptable

Based on the calculations performed, the Cronbach's alpha coefficient falls between 0.6 and 0.8. This range indicates that the test is acceptable, confirming the reliability of the measurement scale for the latent variable under scrutiny. In essence, this result underscores an alpha value within an acceptable range, thereby affirming the internal consistency of the measurement scale employed to evaluate the latent variable.

$$\boxed{0.6 < \alpha = 0.74 < 0.8} \Rightarrow \text{Acceptable measurement scale}$$

This coefficient can also be calculated using another formula:

$$\boxed{\alpha = \frac{N \times \bar{r}}{1 + (N - 1) \times \bar{r}}} \tag{5}$$

With :

- $\bar{r}$ is the average correlation between all pairs of items.

$$\bar{r} = \frac{\sum r_{ij}}{Card(s)}$$

- $Card(s)$ is the number of correlation coefficients to calculate: it is a Combination without Repetition:

$$Card(s) = C_N^p = \binom{N}{p} = \binom{N}{2} = C_N^2$$

- Note that the correlation coefficient of PEARSON between the variables X and Y is given by:

$$r_{xy} = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2}\sqrt{\sum_{i=1}^{n}(y_i - \bar{y})^2}}$$

With :

- n is the number of observations.
- x_i and y_i are the individual values of the variables X and Y.
- $\bar{x}$ and $\bar{y}$ are the means of the variables X and Y respectively.

Based on the previous data, we calculate Cronbach's alpha using the latter formula by following these steps:

1) We have 55 distinct correlation coefficients to calculate:

$$\binom{11}{2} = \frac{11 \times 10}{2} = 55$$

2) We therefore calculate the correlation matrix and we are only interested in the inter-item coefficients (=COEFFICIENT.CORRELATION(Matrix1;Matrix2)) for example: $r_{12} = -0.26$

3) We calculate the average correlation: $\bar{r} = \frac{10.94}{55} = 0.20$

4) Alpha is given by:

$$\alpha = \frac{11 \times 0.20}{1 + (11 - 1) \times 0.20} = 0.733 \boxed{\approx 0.73}$$

III. PCA FACTORIZATION

A. Principle and methods

To refine the measuring instrument, factor analysis is essential. This method aims to reduce the data's dimensionality by identifying the principal components that capture most of the variance. By eliminating redundancy and distinguishing significant variables from those with little impact on the data's variance, this analysis refines the measurement instrument.

Factor analysis also allows for visualizing relationships between variables in a principal component space. This visualization facilitates understanding the data's underlying structure and helps identify patterns and connections between different variables.

Various factor analysis techniques exist, each offering unique nuances and approaches to better explore and interpret multidimensional data.

Factor analysis simplifies result interpretation by condensing many variables into a few. Often called the "Dimension Reduction Method," this approach reduces data dimensions into one or more "super-variables," also known as "constructs." This transformation is crucial for understanding the data's underlying structure and simplifying result interpretation.

The most common factor analysis technique is Principal Component Analysis (PCA). However, the choice between PCA and other multidimensional analyses depends largely on the data's nature. For example, PCA is suitable for quantitative data in a table format ($n \times p$), where rows represent individuals and columns represent variables, such as data from a coded questionnaire. This specific data structure is well-suited for PCA to extract meaningful variable relationships and efficiently reduce data dimensionality.

Principal Component Analysis (PCA) is a statistical method used for data reduction. It involves calculating the eigenvectors of the correlation or covariance matrix of the variables. These eigenvectors describe uncorrelated linear combinations of the variables, enabling data reduction while preserving most of the variance. Moreover, examining PCA eigenvectors helps in better understanding the data's underlying structure.

PCA enables the construction of a new representation system comprising linear combinations of the original variables, facilitating information synthesis.

When applying PCA to analyse a questionnaire, it is crucial to consider several questions:

- Proximity between individuals: Which individuals responded similarly to questions related to a specific variable or concept?
- Resemblance between individuals: What answers show similarities or differences among respondents?
- Relations between questions (items): What connections exist between the various questions?

Thus, the primary objectives, based on the questionnaire data, are to examine the similarity between responses related to a specific concept to ensure a degree of homogeneity, and to explore the variability among items to identify correlations between them.

For example, if a concept (or variable) is measured by a system of n items, PCA can construct a reduced representation of this concept (or variable) comprising ($p < n$) items. This new system will preserve the existing distances (relationships) (internal coherence) between these items.

When implementing a PCA, the main result is:

1) Construct a set of main components (C_1, C_2, ..., C_k, ..., C_p), defined as linear combinations of the original items (centered and scaled)[2], of which we can assess the

quality of information retrieval through the reproduced inertia[3] (λ_k)[4].

$$\begin{cases} C_1 = & a_{11}z_1 + a_{21}z_1 + \cdots + a_{p1}z_p(\lambda_1) \\ \vdots \\ C_k = & a_{1k}z_1 + a_{2k}z_2 + \cdots + a_{pk}z_k(\lambda_k) \\ \vdots \\ C_p = & a_{1p}z_1 + a_{2p}z_2 + \cdots + a_{pp}z_p(\lambda_p) \end{cases}$$

With: z_k is the value of the variable (X_k after centering and scaling) specific to individual k.

2) We observe the decomposition of information into uncorrelated (orthogonal) components.
3) Retain the principal component(s) that maximize the square of their correlation with the variables in the database.

Given that PCA yields multiple results, especially in the context of analyzing questionnaire data measurement instruments, it is crucial to propose a precise approach.

B. PCA Procedure

To analyze the similarity within a dataset, a geometric approach involves studying the distances between individuals, typically measured by the Euclidean distance between two individuals (i, i'): $d^2(i, i') = \sum(x_{ij} - x_{i'j})^2$

Step 1 - Graphical study: This involves examining the graphical representation of the point cloud and includes the following stages:
- Center the data: This ensures that the center of inertia G is located at the origin.
- Standardize the data: This process aims to make variables comparable, especially if they are expressed in different scales or units[5].

Step 2. Analyze the centred and standardized data table: Visualizing the data directly is not possible. To address this, you need to find a more manageable representation (a better projection) of the data. This involves finding a subspace that summarizes the data, achieved through PCA.
- The goal is to project the cloud of 12 individuals onto the first two inertia axes, often referred to as the first factorial plane.
- This projection matrix helps identify the significant factorial axes.

To achieve this, we calculate the eigenvalues (which quantify the amount of information contained in each axis) and the associated eigenvectors. This analysis aids in determining the number of principal components that should be considered.

Step 3. To accomplish this, we calculate the covariance matrix.
- If the data are on the same measurement scale (binary, Likert), there is no need to center or scale; you can simply calculate the correlation matrix.

[3]Dispersion around the barycenter; it is a multidimensional variance (calculated on p dimensions)

[4]Eigenvalues

[5]This refers to a standardized PCA

[2]normed PCA

– In our case, we calculate the correlation matrix.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
Q1	1	-0,26	0,26	0,26	-0,32	0,00	-0,08	-0,08	0,32	-0,26	0,13
Q2	-0,26	1	0,56	-0,33	0,41	-0,19	0,10	0,10	0,00	0,33	0,17
Q3	0,26	0,56	1	-0,33	0,41	0,19	0,49	0,49	0,41	-0,11	0,17
Q4	0,26	-0,33	-0,33	1	0,00	-0,19	0,10	-0,29	0,00	0,33	0,17
Q5	-0,32	0,41	0,41	0,00	1	0,35	0,24	0,60	0,50	0,41	0,21
Q6	0,00	-0,19	0,19	-0,19	0,35	1	0,51	0,85	0,35	0,19	0,30
Q7	-0,08	0,10	0,49	0,10	0,24	0,51	1	0,66	0,12	0,29	0,36
Q8	-0,08	0,10	0,49	-0,29	0,60	0,85	0,66	1	0,48	0,29	0,36
Q9	0,32	0,00	0,41	0,00	0,50	0,35	0,12	0,48	1	0,00	0,43
Q10	-0,26	0,33	-0,11	0,33	0,41	0,19	0,29	0,29	0,00	1	0,52
Q11	0,13	0,17	0,17	0,17	0,21	0,30	0,36	0,36	0,43	0,52	1

Figure 1. Correlation matrix
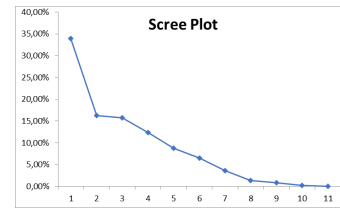
Step 4.1 Next, we reorganize the data into a new system. This is achieved through the diagonalization[6] of the covariance matrix.

We calculate eigenvalues and eigenvectors[7] from the correlation matrix (covariance matrix on centered values). (Excel =eVECTORS(C18:M28;100;FAUX)).

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Somme
Valeurs propres	3,732	1,796	1,735	1,365	0,967	0,719	0,402	0,155	0,100	0,030	0,000	11
Vecteurs propres	-0,032	-0,410	-0,431	-0,405	-0,162	-0,053	-0,540	-0,006	-0,128	-0,173	-0,337	
	0,186	0,531	0,180	-0,421	-0,130	-0,108	-0,171	0,045	0,481	-0,426	0,000	
	0,329	0,249	-0,349	-0,334	-0,281	0,216	-0,002	0,124	-0,130	0,534	0,392	
	-0,083	-0,521	0,333	-0,245	-0,039	0,524	0,028	0,210	0,229	-0,155	0,392	
	0,374	0,158	0,167	-0,076	0,480	0,414	-0,074	0,362	-0,286	0,001	-0,426	
	0,363	-0,199	-0,130	0,469	0,036	-0,140	-0,317	0,351	0,552	0,205	0,000	
	0,353	-0,108	0,045	0,160	-0,608	0,294	0,344	-0,223	0,085	-0,075	-0,446	
	0,471	-0,028	-0,108	0,290	0,009	0,000	-0,157	-0,174	-0,372	-0,539	0,446	
	0,305	-0,212	-0,276	-0,261	0,517	-0,020	0,321	-0,491	0,323	0,042	0,000	
	0,228	-0,104	0,612	-0,088	-0,032	-0,144	-0,426	-0,451	-0,100	0,372	0,000	
	0,294	-0,288	0,199	-0,274	-0,082	-0,605	0,381	0,400	-0,192	-0,025	0,000	

Figure 2. Calculation of eigenvalues and eigenvectors

Step 4.2 Calculate the proportion of variation explained by each eigenvalue and the cumulative percentage explained. For example, 33.92% represents the contribution of C_1 (factorial representation) to the total variability. An alternative method is to construct a graph (Scree Plot) that illustrates the successive differences between the eigenvalues.

eValue	%	Cum %
3,73159933	33,92%	33,92%
1,79569296	16,32%	50,25%
1,73457307	15,77%	66,02%
1,36542382	12,41%	78,43%
0,96669594	8,79%	87,22%
0,71902207	6,54%	93,75%
0,40185851	3,65%	97,41%
0,15491172	1,41%	98,82%
0,10023784	0,91%	99,73%
0,02998475	0,27%	100,00%
7,9797E-17	0,00%	100,00%

The four components—C_1, C_2, C_3, and C_4—explain 78.43% of the variation, which is a relatively high percentage.

Step 5.1 Load the total weight matrix: This matrix will provide us with the loadings =VecteursP*RACINE(ABS(ValeursP)).

Scree Plot

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	Somme
-0,06	-0,55	-0,57	-0,47	-0,16	-0,05	-0,34	0,00	-0,04	-0,03	0,00	1
0,36	0,71	0,24	-0,49	-0,13	-0,09	-0,11	0,02	0,15	-0,07	0,00	1
0,63	0,33	-0,46	-0,39	-0,28	0,18	0,00	0,05	-0,04	0,09	0,00	1
-0,16	-0,70	0,44	-0,29	-0,04	0,44	0,02	0,08	0,07	-0,03	0,00	1
0,72	0,21	0,22	-0,09	0,47	0,35	-0,05	0,14	-0,09	0,00	0,00	1
0,70	-0,27	-0,17	0,55	0,04	-0,12	-0,20	0,14	0,17	0,04	0,00	1
0,68	-0,15	0,06	0,19	-0,60	0,25	0,22	-0,09	0,03	-0,01	0,00	1
0,91	-0,04	-0,14	0,34	0,01	0,00	-0,10	-0,07	-0,12	-0,09	0,00	1
0,59	-0,28	-0,36	-0,31	0,51	-0,02	0,20	-0,19	0,10	0,01	0,00	1
0,44	-0,14	0,81	-0,10	-0,03	-0,12	-0,27	-0,18	-0,03	0,06	0,00	1
0,57	-0,39	0,26	-0,32	-0,08	-0,51	0,24	0,16	-0,06	0,00	0,00	1

Figure 3. Total weight matrix

For instance, the first principal component $\hat{C}_1$ can be calculated using the elements of the first eigenvector.

$$\begin{cases} \hat{C}_1 = & -0.06Q_1 + 0.36Q_2 + \cdots + 0.57Q_{11} \\ \hat{C}_2 = & -0.55Q_1 + 0.71Q_2. + \cdots - 0.39Q_{11} \\ \vdots & \vdots \\ \hat{C}_{11} = & 0.00Q_1 + 0.00Q_2. + \cdots + 0.00Q_{11} \end{cases}$$

Step 5.2 This PCA is termed "Without rotation." It involves retaining the $p = 4$ principal components, which account for 78.43% of the total variability.

It is now important to recalculate the eigenvector/score matrix *only* for the main p factors (components).

	1	2	3	4	Commun	N.Exp
Q1	-0,062	-0,550	-0,568	-0,473	0,853	0,147
Q2	0,360	0,712	0,237	-0,492	0,935	0,065
Q3	0,635	0,333	-0,459	-0,391	0,878	0,122
Q4	-0,160	-0,699	0,438	-0,286	0,788	0,212
Q5	0,723	0,212	0,219	-0,088	0,624	0,376
Q6	0,702	-0,266	-0,171	0,548	0,893	0,107
Q7	0,682	-0,145	0,059	0,187	0,524	0,476
Q8	0,909	-0,037	-0,142	0,339	0,963	0,037
Q9	0,588	-0,284	-0,363	-0,305	0,652	0,348
Q10	0,441	-0,139	0,806	-0,103	0,875	0,125
Q11	0,568	-0,386	0,262	-0,320	0,643	0,357
	3,732	1,796	1,735	1,365	8,627	2,373

Step 6.1 Perform a rotated factor analysis: Obtain a clearer representation of each item's contribution to the selected factor. Here, we opt for an orthogonal Varimax rotation (=VARIMAX(matrix of components;100))

There are several orthogonal rotation methods as well, such as Quartimax, Equamax, and Parsimax, among others.

– The interpretation of principal components involves identifying the variables that are most strongly correlated with each component $\hat{C}_p$.

– A correlation greater than 0.5 in absolute value is considered significant.

– $\hat{C}1$ is the linear combination of variable Q that exhibits the maximum variance (among all linear combinations).

---

[6]The diagonal matrix is formed from the eigenvalues.
[7]An eigenvector of a linear transformation f is any vector x such that $f(x) = \lambda x$.

	1	2	3	4	Commun	Specific
Q1	-0,136	-0,012	-0,890	0,206	0,853	0,147
Q2	-0,108	-0,078	0,153	-0,945	0,935	0,065
Q3	0,324	0,217	-0,468	-0,712	0,878	0,122
Q4	-0,223	-0,746	-0,182	0,386	0,788	0,212
Q5	0,488	-0,262	0,074	-0,558	0,624	0,376
Q6	0,933	0,019	-0,041	0,147	0,893	0,107
Q7	0,677	-0,216	-0,036	-0,133	0,524	0,476
Q8	0,953	-0,011	-0,067	-0,224	0,963	0,037
Q9	0,420	-0,126	-0,642	-0,219	0,652	0,348
Q10	0,230	-0,814	0,329	-0,225	0,875	0,125
Q11	0,332	-0,644	-0,287	-0,189	0,643	0,357
	2,998	1,820	1,683	2,127	8,627	2,373

	1	2	3	4
Q1	-0,136	-0,012	**-0,890**	0,206
Q2	-0,108	-0,078	0,153	**-0,945**
Q3	0,324	0,217	-0,468	**-0,712**
Q4	-0,223	**-0,746**	-0,182	0,386
Q5	0,488	-0,262	0,074	**-0,558**
Q6	**0,933**	0,019	-0,041	0,147
Q7	**0,677**	-0,216	-0,036	-0,133
Q8	**0,953**	-0,011	-0,067	-0,224
Q9	0,420	-0,126	**-0,642**	-0,219
Q10	0,230	**-0,814**	0,329	-0,225
Q11	0,332	**-0,644**	-0,287	-0,189

- More precisely, the coefficients following $a11, a12, \ldots, a1p$ are determined to maximize the variance, while ensuring that the sum of the squares of the coefficients equals one, i.e., $\mathbf{A}_1'\mathbf{A}_1 = \sum_{j=1}^{p} A_{1j}^2 = 1$
- This constraint is necessary to obtain a unique solution.

$\mapsto$ The $\hat{C}_1$ exhibits a strong correlation with three initial variables. It rises alongside the scores of Q_6, Q_8, and Q_7, indicating a simultaneous variation in these three criteria (items). An increase in one of them tends to coincide with increases in the others.

$\mapsto$ Moreover, $\hat{C}_1$ exhibits the highest correlations with Q_8 (0.953) and Q_6 (0.933). Based on these correlations, we can assert that this principal component primarily reflects these two items, suggesting that it serves as a measure (or construct) of these variables.

- $\hat{C}2$ is the linear combination of variable Q that captures as much of the remaining variation as possible, with the additional constraint that its correlation with $\hat{C}1$ is 0.
- More precisely, we define $a21, a22, \ldots, a2p$ to maximize the variance of this new component, while ensuring that the sum of the squared coefficients $\sum j = 1^p a_{2j}^2 = 1$, and with the additional constraint that these components are uncorrelated: $\mathrm{cov}(C_1, C_2) = \sum_{k=1}^{p} \sum_{l=1}^{p} a_{1k}a_{2l}\sigma_{kl} = \mathbf{A}_1'\Sigma\mathbf{A}_2 = 0$.

$\mapsto$ $\hat{C}_2$ decreases as the scores of Q_4, $Q10$, and $Q11$ increase. This component can be interpreted as a construct that combines these three items.

- In this example, we assume that the variable Q is measured by different items ($Q_1, Q_2, \ldots, Q_{11}$).
- The application of PCA *without rotation* resulted in retaining 4 principal components that explain a total variability of 78.43% (Eigenvalues > 1).

- *Following rotation* (Varimax), we conclude that:
  - $\hat{C}1$ alone captures 33.92% of the variance (eigenvalue = 3.7315). This factor is primarily represented by: Q_6, Q_7, Q_8.
  - $\hat{C}2$ alone captures 16.32% of the variance (eigenvalue = 1.795) and contributes to a cumulative variance of 50.25%. This factor is mainly represented by: Q_4, Q_{10}, Q_{11}.
  - $\hat{C}3$ alone captures 15.77% of the variance (eigenvalue = 1.734) and contributes to a cumulative variance of 66.02%. This factor is mainly represented by: $Q_1, Q9$.
  - $\hat{C}4$ alone captures 12.41% of the variance (eigenvalue = 1.305) and contributes to a cumulative variance of 78.43%. This factor is mainly represented by: $Q_2, Q3, Q_5$.
- Q is measured by 4 constructed, non-collinear (orthogonal) components. Consequently, regressions can be performed.
- Each construct is a linear combination of the items that constitute it.

IV. Diagnostic tools

When conducting Principal Component Analysis (PCA), it's often necessary to explore various approaches to reach a satisfactory solution. This may involve multiple analyses to assess result relevance.

A crucial step is reviewing the correlation matrix. This involves checking for excessively high correlations between variables and evaluating the overall quality of the data representation.

An important criterion is that each variable should have a factor loading greater than 0.30 for at least one factor, indicating a significant contribution to the data structure.

This process may require iteration, repeating the analysis until a simple and satisfactory solution is found that effectively summarizes the data structure.

The evaluation of PCA's relevance includes a subjective element: does grouping these elements make sense?

After rotation, there are many potential solutions, making it challenging to determine a single "correct" one. The solution should be seen as a plausible proposition consistent with the data, rather than an absolute "answer."

These considerations lead to two distinct situations:

1) When variables are perfectly correlated, a single factor axis can restore all (100%) of the available information.
2) Conversely, if variables are pairwise independent (i.e., orthogonal), the number of factors needed is equal to the number of variables.

To validate this data reduction, it is essential to calculate certain indicators:

- Bartlett's sphericity test, typically conducted before implementing PCA.
- The Kaiser-Meyer-Olkin (KMO) index, typically evaluated after PCA has been conducted.

These indicators verify the validity of the data reduction approach and ensure the robustness of the results obtained.

A. Sphericity test

This test aims to determine the extent to which the correlation matrix $\Re$ of the data (observed matrix) significantly deviates from the unit matrix (theoretical matrix under the null hypothesis H_0).

Decision rule :

$$\begin{cases} H_0: & |\Re| = 1 \\ H_1: & |\Re| \neq 1 \end{cases} \Leftrightarrow \begin{cases} H_0: & \text{Determinant of } \Re = 1 \\ H_1: & \text{Determinant of } \Re \neq 1 \end{cases}$$

Test statistic :

$$\chi^2 = -(n - 1 - \frac{2p + 5}{6}) \times ln\,|\Re|$$

Under H_0, it follows a χ^2 distribution with $[p \times \frac{(p-1)}{2}]$ degrees of freedom.

If the test result leads to rejecting the null hypothesis H_0 (significantly different from H_0), this implies that there are very strong redundancies in the data, indicating that they only contain one type of information ($|\Re| \neq 1$). In this case, the test statistic is such that $\chi^2 < \chi^{2\theta}$.

If the test result incorrectly leads us to reject the "accepted" null hypothesis H_0 ($|\Re| = 1$), PCA will not be very useful because the variables are nearly orthogonal pairwise. In this case, $\chi^{2c} > \chi^{2\theta}$.

Bartlett's test for sphericity should not be confused with Bartlett's test for equality of variances, as they are two distinct tests despite their similar names.

B. The KMO index

The Kaiser-Meyer-Olkin (KMO) test assesses whether it is feasible to find a meaningful factor analysis of the data. In this context, the index compares the raw correlations with the partial correlations.

The concept behind partial correlation is that the raw correlation between two variables is influenced by the other $(p-2)$ variables.

Partial correlation is used to assess the net relationship between two variables by eliminating the influence of the other variables.

Decision rule :

The index KMO takes values between 0 and 1.

Test statistic:

$$kmo = \frac{\sum_i \sum_{j \neq i} r_{ij}^2}{\sum_i \sum_{j \neq i} r_{ij}^2 + \sum_i \sum_{j \neq i} a_{ij}^2}$$

- If the KMO index is close to 0, partial correlations are similar to raw correlations, indicating that effective data reduction is not possible and that the variables are pairwise orthogonal.
- If the KMO index is close to 1, it indicates that we can obtain an excellent summary of the information on the first factorial axes.

In practice : The decision rule adopted within the framework of ACP is as follows:

KMO	< 0.5	$0.5 - 0.6$	$0.6 - 0.7$
	Unacceptable	insufficient	poor
KMO	$0.7 - 0.8$	$0.8 - 0.9$	$0.9 - 1$
	Moderately	Good	Excellent

Table I

KMO INDEX DECISION RULE

To perform this test in Excel, we first need to calculate the matrix of partial correlations by inverting the correlation matrix (denoted as F), which is then multiplied by the square root of the diagonal of matrix F with the addition of the identity matrix twice.

The KMO index is calculated using two matrices: the correlation matrix and the partial correlation matrix. Specifically, the KMO index is equal to the ratio of the sum of the squares of the correlations to the sum of the squares of the partial correlations.

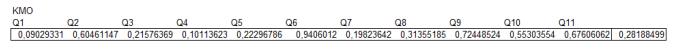| KMO										
Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
0,09029331	0,60461147	0,21576369	0,10113623	0,22296786	0,9406012	0,19823642	0,31355185	0,72448524	0,55303554	0,67606062	0,28188499

Figure 4. Calculation of the KMO index

Based on the results from our hypothetical data, a KMO index of 0.28 indicates a relatively poor fit of the data for this technique. This suggests that the variables in the dataset are not highly interdependent and are not suitable for dimensional reduction using Factor Analysis.

In essence, a KMO value below 0.5 typically indicates that Factor Analysis may not be appropriate or reliable for that particular dataset. This suggests that alternative analysis methods might be more suitable, or that the data itself may need to be revised or transformed for better utilization in this analytical context.

C. Study of the distributions of constructed variables

The goal is to calculate the "average" score obtained by each individual on the different items related to the same construct. This is done to test the normality of the constructs obtained from the PCA analysis.

In practice, we need to create one or more new variables (factors) called scores. These scores are then used to study the distribution of the constructs.

In Stata, we use the command predict score1, score to calculate these scores based on the results of the PCA (i.e., after rotating the PCA).

Analyzing the distributions of the newly generated variables is crucial. It is important to visually inspect and compare these distributions to a Gaussian distribution.

To do this, providing descriptive statistics of the scores is essential, as it offers a detailed overview of these new variables. Additionally, for visual representation, creating graphs that illustrate the distribution of scores is necessary. This typically involves generating a histogram of scores with a normal distribution curve and plotting a quantile-quantile plot (q-q plot) to assess the normality of the data.
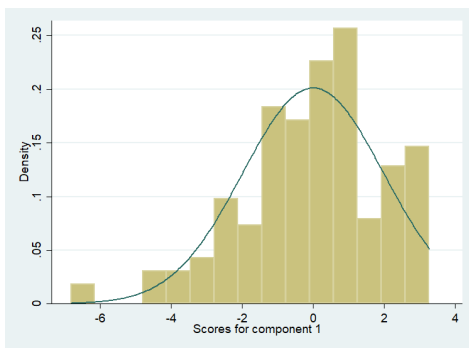
Figure 5. Distribution of the first principal component

The analysis of this graph confirms that the latent variable named "score1" does not follow a normal distribution, as indicated by its lack of symmetry and its leptokurtic shape.

CONCLUSION

In this study, we investigated the application of factor analysis to survey data, emphasizing its robustness in dealing with various challenges encountered in real-world scenarios. Our findings indicate that despite the unique context of data collection, these techniques demonstrate a remarkable ability to accurately and coherently process complex data. While their use in such contexts requires careful attention, it remains viable and fruitful for uncovering the underlying structures of multidimensional data.

This study underscores the significance of considering the reliability of measurement instruments in surveys, as it directly impacts the quality of the analyzed data. By outlining key recommendations for conducting reliable analyses, we aim to assist practitioners and researchers in adopting robust methodologies, thereby ensuring the meaningful and reliable interpretation of results.

In conclusion, this comprehensive exploration of the robustness of factorial techniques in survey data sheds light on their practical utility. It also underscores the ongoing need for research aimed at enhancing these methods, while highlighting their relevance and potential for accurate and meaningful analyses in complex survey data scenarios.

REFERENCES

[1] Bourass H. & Soussi Noufail O. (2022) Principal component Analysis applied to servey data : Methodological scpects & application. International Journal of Optimisation and applications.

[2] Byrne, B. M. (2016). *Structural Equation Modeling With AMOS: Basic Concepts, Applications, and Programming* (3rd ed.). Routledge.

[3] Costello, A. B., & Osborne, J. W. (2005). Best Practices in Exploratory Factor Analysis: Four Recommendations for Getting the Most From Your Analysis. *Practical Assessment, Research & Evaluation*, 10(7), 1-9.

[4] Gorsuch, R. L. (1983). *Factor Analysis*. Lawrence Erlbaum Associates, Inc.

[5] Gorsuch, R. L. (1988). Exploratory Factor Analysis: Its Role in Item Analysis. *Journal of Personality Assessment*, 52(3), 355-369.

[6] Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate Data Analysis*. Pearson Prentice Hall.

[7] Kaiser, H. F. (1974). An Index of Factorial Simplicity. *Psychometrika*, 39(1), 31-36.

[8] Norman, G. R., & Streiner, D. L. (2008). *Biostatistics: The Bare Essentials*. PMPH-USA.

[9] Streiner, D. L. (2003). Starting at the Beginning: An Introduction to Coefficient Alpha and Internal Consistency. *Journal of Personality Assessment*, 80(1), 99-103.

[10] Stevens, J. (2009). *Applied Multivariate Statistics for the Social Sciences*. Routledge.

[11] Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics*. Pearson Education.

V. ANNEXE

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Score
1	1	1	1	1	1	1	1	1	1	1	1	11
2	1	1	1	1	1	1	1	1	0	1	0	9
3	1	0	1	1	1	1	1	1	0	0	0	8
4	1	1	1	0	1	1	0	1	1	0	0	7
5	1	1	1	1	1	0	0	0	1	0	0	6
6	0	1	1	0	1	1	1	1	0	0	0	6
7	1	1	1	1	0	0	1	0	0	0	0	5
8	1	1	1	1	1	0	0	0	0	0	0	5
9	0	1	0	1	1	0	0	0	0	1	0	4
10	1	0	0	1	0	1	0	0	0	0	0	3
11	1	1	1	0	0	0	0	0	0	0	0	3
12	1	0	0	1	0	0	0	0	0	0	0	2
$\sum$	10	9	9	9	8	6	5	5	4	3	1	**69**

Table II

EXAMPLE DATABASE

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
0,447	0,577	0,577	0,577	0,707	1,000	1,183	1,183	1,414	1,732	3,317
0,447	0,577	0,577	0,577	0,707	1,000	1,183	1,183	-0,707	1,732	-0,302
0,447	-1,732	0,577	0,577	0,707	1,000	1,183	1,183	1,414	-0,577	-0,302
0,447	0,577	0,577	-1,732	0,707	1,000	-0,845	1,183	1,414	-0,577	-0,302
0,447	0,577	0,577	0,577	0,707	-1,000	-0,845	-0,845	1,414	-0,577	-0,302
-2,236	0,577	0,577	-1,732	0,707	1,000	1,183	1,183	-0,707	-0,577	-0,302
0,447	0,577	0,577	0,577	-1,414	-1,000	1,183	-0,845	-0,707	-0,577	-0,302
0,447	0,577	0,577	0,577	0,707	-1,000	-0,845	-0,845	-0,707	-0,577	-0,302
-2,236	0,577	-1,732	0,577	0,707	-1,000	-0,845	-0,845	-0,707	1,732	-0,302
0,447	-1,732	-1,732	0,577	-1,414	1,000	-0,845	-0,845	-0,707	-0,577	-0,302
0,447	0,577	0,577	-1,732	-1,000	-1,000	-0,845	-0,845	-0,707	-0,577	-0,302
0,447	-1,732	-1,732	0,577	-1,414	-1,000	-0,845	-0,845	-0,707	-0,577	-0,302

Table III

CALCULATION OF CENTERED VALUES

Figure 6. Inverse of the correlation matrix

Figure 7. Partial correlation matrix

Figure 8. Score matrix

Analysis of the difficulties of promoting the practice of impact assessment of public policies: An empirical study in the Moroccan context

HOUSNI Said
PhD student
Laboratory of Economics and Management of Organizations- Faculty of Economics and Management-Ibn Tofail University- Kénitra- Morocco
said.housni@uit.ac.ma

HASNAOUI Rachid
Research Teacher
Laboratory of Economics and Management of Organizations- Faculty of Economics and Management-Ibn Tofail University- Kénitra- Morocco
rachid.hasnaoui@uit.ac.ma

Abstract

In an unpredictable context in Morocco marked by severe budgetary constraints, a growing demand for the efficient use of public funds and the rationalization of financial resources, knowledge and measurement of the net effects of the public actions put in place seem essential. Indeed, at a time when citizens aspire to good results, the use of evaluation has also become an absolute priority to be taken into consideration.

In this respect, there has been considerable interest in integrating this this evaluation into the process of setting up and implementing public policies (PP), thanks to the efforts made by public authorities. However, despite the significant progress made, the institutionalization of this practice is still in its early stages.

This article aims to provide an in-depth understanding and analysis of the extent to which measures of the impact of public policies on the target population have been implemented in the Moroccan context. The aim is to identify the difficulties that negatively affect the integration and generalization of this practice in the functioning of public services.

Empirically, analysis of the results revealed that the degree of integration of the practice of impact assessment of public policies in the Moroccan context remains low-due to several difficulties hindering its institutional and organizational anchoring.

Keywords— Impact assessment, Public policy, Institutionalization, Morocco.

Introduction

In every country in the world, the evaluation of public policies and programs remains a central issue at the heart of any public debate concerning the measurement of the effects of public intervention, and the modernization and reform of public action.

In this same sense, in an era of new public management emergence, impact assessment has emerged as a questioning method and essential practice in the world of public policy, since it enables the overall performance of all the actions carried out by the State and the Local Governments to be assessed.

Interestingly, this topic constitutes the subject of a body of scientific literature. More than 11 years ago, Gertler & al, (2011) presented a focused definition of impact evaluation, specifying that it is a kind of structured evaluation based on a specific type of evaluation questions. These questions aim at researching and identifying the impact or causal effect of a public policy or program on a given outcome.

In this context, referring to the work carried out by Ceneviva & Farah (2012), it proves that impact assessment remains one of the essential tools based on the production of evidence enabling innovative and alternative solutions to be proposed to the various problems detected in conducting public interventions. The two aforementioned authors add that it is indeed a practice intended for improving the effectiveness of different public spending, quality management, and the control of the actions carried out by governments.

In the Moroccan context, in recent years, the evaluation of public policies has taken on crucial importance for public authorities and has become the focus of all economic debate concerning the measurement of the impact of public interventions. Indeed, the attention given to promoting this practice, which was gradually beginning to develop, was also reflected in the country's stated commitment to developing this approach. This has been achieved through the creation of a series of independent public institutions specialized in carrying out the evaluation studies on public interventions.

Furthermore, the 2011 Moroccan Constitution represented an important turning point in consolidating and boosting the practice of public policy evaluation as a necessary component of the implementation process of any public action. The adoption of this Constitution has stimulated this practice, particularly through the strengthening of the Parliament's powers to carry out evaluation missions (articles 70 and 101).

However, despite these remarkable efforts, several researchers, particularly those originating from Morocco,

have identified a series of recurring constraints limiting the development of the practice of impact assessment of public actions (policies, programs, systems) in the Moroccan context.

For our article, the choice to delve deeper into this research issue is justified by the importance of the institutional anchoring of this practice, given its usefulness as an effective mechanism for improving public management, modernizing the State, and producing evidence relating to the effectiveness and efficiency of public actions.

Our research seeks to deepen our reflection on the extent to which public policy impact assessment is applied in the Moroccan context. By shedding light on the involvement of the various stakeholders interested in promoting this practice, we seek to provide elements of an answer to the following essential question: **What are the five major difficulties that make difficult the practice of public policy impact assessment in the Moroccan context**?

In the same vein, our article will be structured as follows: In the 1st axis, we will dissect the process of institutional anchoring of public policy evaluation in the Moroccan context.

The 2nd axis will be devoted to the objective identification of the five major difficulties hindering the integration of impact assessment in public services, with focus on assessing public action.

Finally, the 3rd axis will be devoted to the presentation and discussion of the results obtained from the empirical analysis, which offers a synthesis of a set of future perspectives that we believe will be of great use in improving and strengthening the practice of impact assessment in the Moroccan context.

I. Assessing the impact of public policies in Morocco: Literature Review

With to aim to promote the implementation of public policy impact assessment, it is pertinent to point out that the institutionalization of this practice is conditional on the provision of solid preliminary foundations, which represents a major issue that must be raised and taken into consideration by public decision-makers.

1. From Constitutionalization to institutionalization of public policies impact assessment

Regarding this point, it is imperative to discuss the process of integrating evaluation in the Moroccan public sector, which consists of certain institutions whose creation was a necessary condition for carrying out impact evaluation missions of public interventions.

1.1 Institutionalization, a foodstuff for public policies impact assessment

Numerous researchers around the world have examined the institutionalization of public policy evaluation. Among them, Jacob, S. (2005), argues that engaging in the process of institutionalizing this practice can make a significant contribution to triggering new approaches to public management, by accrediting this new approach to everyday public service work.

Moreover, the author added that the institutionalization of this practice in the workings of public bodies constitutes a real challenge for public authorities in two important dimensions (cognitive and structural), which reflects positively on the image of the State. Similarly, S. Jacob (2005) argues that this represents a powerful lever likely to contribute strongly to promoting a culture of governance and rational management of public money.

In the case of Morocco, as in other countries around the world, the fact of working in an unpredictable context characterized by a scarcity of public funds makes it imperative to assess the impact of public spending. Faced with this reality, public managers are obliged to review and change the way they intervene; they must also think about investing in establishing the foundations of the evaluation approach.

Despite numerous efforts and tangible advances, the integration of impact assessment into day-to-day public action remains timid, with a worrying backlog. In fact, it has failed to live up to the aspirations of citizens demanding rationalization of public spending, as has been concretely reported in a series of research studies.

Indeed, this worrying finding was confirmed by Arcand (2014) in his research on the subject. He noted a worrying lack of impact assessment missions for social development programs in developing countries.

In the same vein, based on the work carried out by a group of Moroccan researchers, a remarkable problem was raised. It related to the existence of an incompressible confusion between evaluation and other related activities (audit, legality control, etc.) that arise in the field of public management.

Reflection on the crucial importance of impact assessment in guiding public action has led researchers to take an interest in addressing this research issue, particularly in the Moroccan context. They have highlighted the predominance of financial and administrative control in the evaluation of public action in most public institutions.

A case in point is the research carried out by M. Harakat (2006), who questioned the evaluation of public action in the Moroccan context, confirming the predominance of classic controls (audit, compliance control, etc.) in the sphere of public policy analysis. The aforementioned author criticized this observation, adding that the confusion between the various practices constitutes a real obstacle to the introduction and development of public action evaluation in the Moroccan context.

This is the background to the research carried out by Mourabit (2010) as general rapporteur of the Court of Account. He analyzed the experience of the Court of Account in evaluating the public policies implemented by the various development players.

Similarly, S. Mourabit affirmed that the evaluation work carried out by this constitutional institution is fundamentally based on a performance triangle comprising three inseparable components (objectives, means, and results). He added that, in

principle, the Court of Auditors' evaluation approach regularly relies on the use of the cost/benefit method, based on results and variances.

Nevertheless, according to S. Mourabit, the Court of Account does not fully carry out its functions and missions concerning the assessment of the effects of public policies and programs, due to a shortage of qualified human capital and competent experts capable of carrying out a reliable, rigorous assessment with quality results.

Based on the example of the Court of Account he added that, despite the incorporation of evaluative practice into the Moroccan institutional and organizational landscape, its activities remain scattered and unsystematic. In addition, S. Mourabit stressed that the visibility of evaluation in the modernization and assessment of the effects of public interventions is low in the eyes of most public officials, and is poorly confirmed in legal texts. The latter constitutes a mechanism for overcoming the inhibitions of certain stakeholders (Jacob & al., 2015).

For his part, Bencheikh (2013) raised an important question: the degree to which the practice of evaluating the net effects of public interventions has been implemented in the Moroccan context. According to the author, the willingness to introduce the evaluative approach remains fundamentally linked to the implementation of democratic principles in the various existing systems on the national level, giving priority to the need for "Accountability" to the detriment of other practices for assessing the effects of public schemes, notably evaluation.

In his article entitled: « *L'évaluation des politiques publiques par la Cour des Comptes au Maroc* », Berrada (2019) also noted that the practice of impact assessment remains weak and is in its early stages in the Moroccan context. The author also asserted that Morocco does not yet have the cultural dimension relating to the promotion of impact evaluation of implemented public policies.

Moreover, this finding was confirmed by the number of impact assessment missions carried out, which remains limited, timid, and below expectations, given that over the period (1999-2021) forty (40) impact assessment missions were carried out, with an annual average of 1.82 in the various public action sectors (K. El MOUTAOUAKIL & A. BAGUARE, 2024).

Similarly, this important conclusion has also been verified in research by Bencheikh (2021), according to which impact assessments are not applicable in the Moroccan context due to ethical considerations.

1.2 Conceptual model and research hypotheses

1.2.1 Research Model

An analysis of the theoretical and empirical literature on the same subject shows that the impact assessment of a public policy involves determining and shaping the causal link between the policy implemented and the changes observed.

Fig.1: Conceptual Model for the study
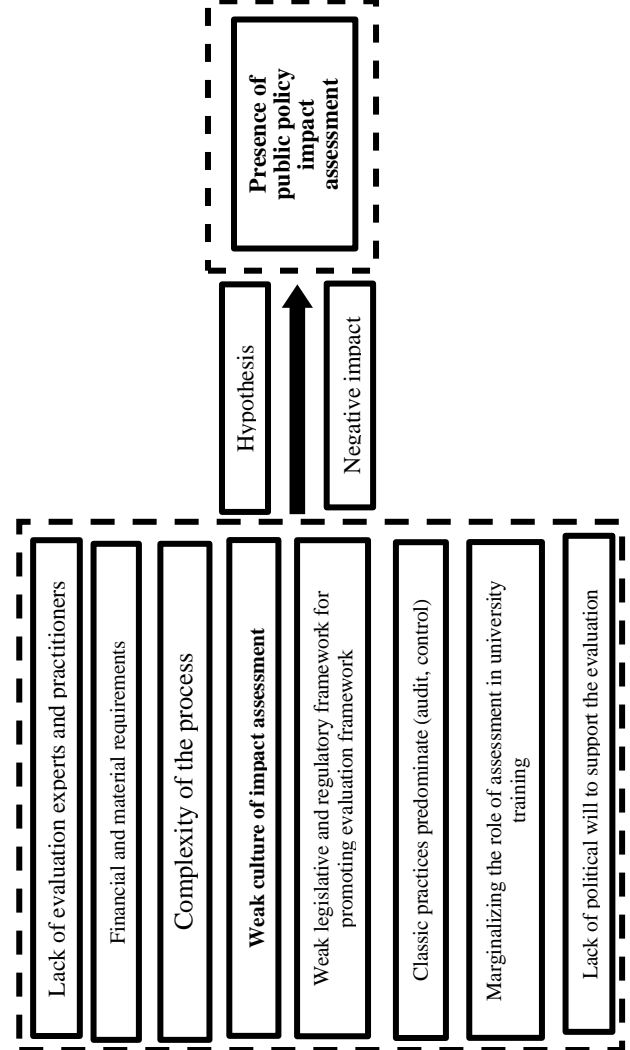
Source: Authors, based on literature review

Within this framework, our Research Model is based on an overall hypothesis suggesting the existence of a negative relationship between a set of major difficulties and the degree of integration of the practice of public policy impact assessment in the Moroccan context.

1.2.2 Research hypothesis

Taking into account our research question, the hypotheses we propose to test are derived from and retained from the literature review dealing with this type of theme. They can be formulated as follows:

GH: The absence of public policy impact assessment practice in the Moroccan context is linked to a set of difficulties.

H1: The lack of experts and practitioners has a negative impact on the practice of public policy impact assessment;

H2: The need for financial and material resources has a negative impact on the performance of impact assessment missions;

H3: The complexity of the impact evaluation approach has a negative influence on its promotion in the Moroccan context;

H4: The weak culture of public policy impact assessment among public decision-makers is a major obstacle to its development;

H5: The lack of a strong will on the part of Moroccan public authorities is a worrying obstacle to the integration of impact assessment into public policy analysis;

H6: The more traditional controls dominate in the field of public policy, the lower the probability of resorting to the practice of impact assessment.

H7: The marginalization of public policy impact assessment in university courses has a negative impact on its development.

2. Difficulties in the practice of impact assessment of public policies in the Moroccan context: Methodology and Results

As previously mentioned, Moroccan public decision-makers have chosen to commit themselves irreversibly to a new reform, making all public policies systematically subject to evaluation.

This second line of research aims to explore and gain in-depth knowledge of the major difficulties hindering the integration of the practice of public policy impact assessment within the Moroccan public administration.

1. Research Methodology

The method of data collection, the characteristics of the sample studied, and the analysis of the results obtained are successively set out as a roadmap enabling the researcher to provide some answers to the research question posed.

1.1 Data collection method

In the Moroccan context, understanding the degree of institutional and organizational anchorage of the practice of impact assessment of public policies necessarily requires knowledge of how this issue is perceived by the public decision-makers concerned. It is therefore based on an exploration of the major obstacles which negatively influence the integration and development of this practice within public institutions on national and regional levels.

To carry out this research, our approach consists of using the questionnaire technique. The latter remains the most widely used method of gathering information, enabling the researcher to connect the theoretical level with the field work level. Methodologically, we distributed the questionnaire to a group of public decision-makers involved in the design, implementation, and evaluation of public policies in various fields of public action.

1.1 Method for analyzing data

To process the data collected from our survey sample, we opted for an analysis using SPSS software.

1.2 Empirical Results

To answer our research question, our empirical methodology uses Ministerial Departments, Local Governments, and Public Establishments and Enterprises as our study population. We aim to gain precise knowledge on the major difficulties

hindering the use of impact assessment for the various public interventions implemented.

1.2.1 Sample characterization

✦ Classification by gender

The table below clearly illustrates the gender of the respondents in our study sample.

Table 1: Classification of interviewees by gender

		Number	Percentage	Valid percentage	Cumulative percentage
Valid	Female	15	29,4	29,4	29,4
	Male	36	70,6	70,6	100,0
	Total	51	100,0	100,0	

Source: Elaborated by the authors

Analysis of the data obtained on the population surveyed reveals that over 70% of the sample of respondents to our questionnaire is male, compared with over 29% who are female.

✦ Classification by age

The following table presents and illustrates the classification of our survey respondents

Table 2: Classification of interviewees by age

		Number	Percentage	Valid percentage	Cumulative percentage
Valid	20-30	17	33,3	33,3	33,3
	30-40	26	51,0	51,0	84,3
	40-50	7	13,7	13,7	98,0
	50-60	1	2,0	2,0	100,0
	Total	51	100,0	100,0	

Source: Elaborated by the authors

✦ Classification by Working experience

The following table shows the professional experience of our sample.

Table 3: Classification of respondents by professional experience

|		Number	Percentage	Valid percentage	Cumulative percentage
Valid	1	3	5,9	5,9	5,9
	2	6	11,8	11,8	17,6
	3	4	7,8	7,8	25,5
	4	6	11,8	11,8	37,3
	5	6	11,8	11,8	49,0
	6	6	11,8	11,8	60,8
	7	5	9,8	9,8	70,6
	8	1	2,0	2,0	72,5
	9	1	2,0	2,0	74,5
	10	3	5,9	5,9	80,4
	12	2	3,9	3,9	84,3
	14	1	2,0	2,0	86,3
	15	1	2,0	2,0	88,2
	16	2	3,9	3,9	92,2
	18	1	2,0	2,0	94,1
	22	1	2,0	2,0	96,1
	25	1	2,0	2,0	98,0
	30	1	2,0	2,0	100,0
	Total	51	100,0	100,0	

Source: Elaborated by the authors

As for the experience of the people questioned, analysis of the data relating to our sample shows that they have an average experience of 7.44 years, given that the experience of the people questioned during our survey ranges from 1 to 30 years.

Classification by workstation

The table below clearly illustrates the categorization and classification of respondents according to their workstations.

Fig. 2: Classification of respondents by workstation
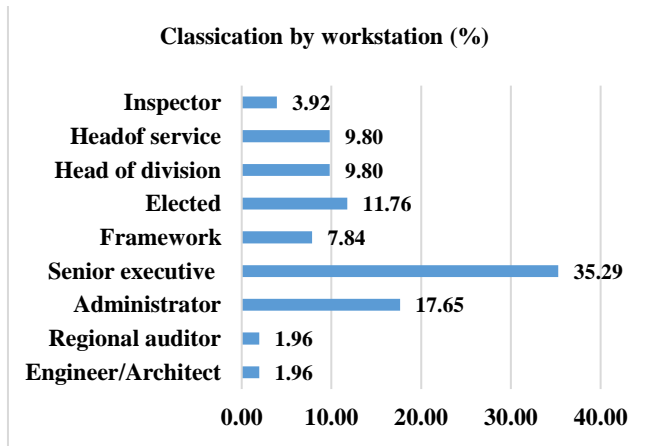
Source: Elaborated by the authors

Based on the results obtained above, the majority of those interviewed occupy senior management positions, with a rate of 35.29%, followed by directors, who account for a substantial 17.65%. In 3rd place, we find elected representatives from Local Governments with a percentage of 11.76%.

Table 2: Classification of sample organizations by type

Type of organization	Number	Percentage (%)	(%) Cumulative
Ministerial Departments	37	72,5	72,5
Public Establishments and Enterprises	7	13,75	86,25
Local Governments	7	13,75	100
Total	**51**	**100 %**	------

Source: Elaborated by the authors

Finally, an analysis of the content of the questionnaires collected shows that the majority of respondents belong to Public Establishments and Enterprises (EEP), with an overall percentage approaching three-thirds (72.5%), followed by Ministerial Departments and Local Governments, notably the regions, with an equivalent percentage of 13.75%.

1.3.2 The difficulties of assessing the impact of public policies

The Moroccan case provides the framework for our research. It should be remembered that the main aim of this analysis is to identify the major obstacles that make it difficult to integrate the practice of public policy impact assessment in the Moroccan context.

The table below clarifies the results of our field analysis. It has enabled us to identify and gain a clearer idea of the difficulties that make it difficult to anchor the practice of public policy impact assessment in the Moroccan context.

**Table 4**: Difficulties encountered in assessing the impact of public policies

Difficulty modes	Major difficulties in the practice of public policy impact assessment in the Moroccan context
M1	The predominance of other practices (audit, regularity control, etc.).
M2	Lack of strong political will to implement this practice.
M3	Lack of experts and practitioners in public policy impact assessment
M4	The complexity of public policy impact assessment process
M5	the need for financial and material resources to carry out public policy impact assessments
M6	The lack of a culture of policy impact assessment among public decision-makers
M7	The lack of a legislative and regulatory framework imposing public policy impact assessment
M8	The marginalization of public policy impact assessment in university training courses

Source: Elaborated by the authors

Analysis of the difficulties of evaluating the impact of public policies

Empirically, the arrangement of the modalities in the table above demonstrates the relevant results as shown in the graph below.
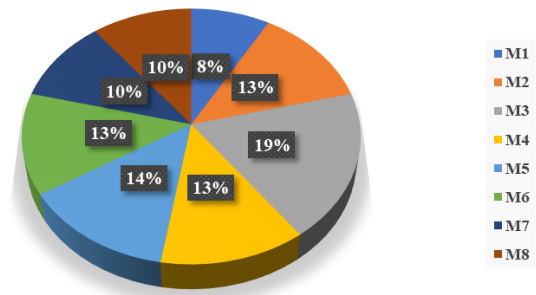
Source: Elaborated by the authors

2. Results and discussion

The main aim of this empirical study is to identify in detail the major difficulties that stand in the way of promoting the practice of public policy impact assessment in the Moroccan context.

Consequently, the results of our research also show that the lack of experts and practitioners in the field of public policy impact assessment is the first difficulty preventing the development of this practice in the Moroccan context,

followed by the need to commit the financial and material resources required to carry out this type of assignment.

As a second category of difficulties, our results confirm that the weak culture of public policy impact assessment among public decision-makers has been revealed as a major difficulty hindering the development of this practice in public services. Similarly, our results show that the complexity of the approach and the lack of a strong political will are among the major difficulties slowing down the promotion of impact assessment practice in the operation of public services.

In general, it is worth recalling that the empirical results obtained are in line with the theoretical literature, and in particular with the results we analyzed in the first part of our research, according to which the practice of impact assessment of public policies is experiencing a certain difficulty in the Moroccan context, due to the presence of a series of major difficulties requiring more effort and decisions.

In short, the results of our research enabled us to validate five hypotheses initially put forward and to reject three. It turned out that the practice of impact assessment of public policies suffers from five major difficulties that slow down its development in the Moroccan context, as presented in the summary table below:

Table 4: Hypotheses validation

Hypotheses	Hypotheses testing
The predominance of other conventional practices (audit, regularity control, etc.) in the impact assessment of public policies	Not valid
Lack of strong political will to implement this practice	Valid
Lack of experts and practitioners in public policy impact assessment	Valid
The complexity of the public policy impact assessment process	Valid
The need for financial and material resources to assess the impact of public policies	Valid
Public decision makers' lack of familiarity with public policy impact assessment	Valid
The lack of a legislative and regulatory framework for imposing impact assessments on public policies	Not valid
The marginalization of public policy impact assessment in academic training courses	Not valid

Source: Elaborated by the authors

3. Prospects and future research

To justify public decisions and guarantee the rationalization of financial resources, Moroccan public authorities are aware of the decisive role of the evaluation approach as a new way of reorienting public actions and assessing their effects.

In response to the low number of impact assessment missions carried out, public decision-makers have launched a host of concrete initiatives aimed at integrating and developing this practice into the workings of public services.

This strategic orientation has been considerably developed through the creation of a series of bodies and organizations specialized in the evaluation of public interventions, such as Parliament, the Court of Account, the Economic, Social and Environmental Council, and, most recently (2021), the creation of the MICEPP1.

It should also be remembered that this desire has been asserted over the years by the extension of the prerogatives of a group of highly important players in terms of evaluating public interventions, notably through the affectivity of contributions and the provisions of the Constitution adopted in 2011 (article 70).

However, the results of our research show that the integration of the practice of impact assessment of public policies in the Moroccan context is lagging worryingly behind, as it is confronted with a multitude of difficulties that are blocking its institutional development and promotion.

At the end of this thematic review of research on the issue of integrating the practice of impact assessment of public policies in the Moroccan context, the preceding developments on this suggest lead us to issue a set of recommendations stemming from and emerging from our empirical investigation.

In this respect, a series of future prospects can be envisaged for the sake of contributing to the promotion of the impact assessment culture in the day-to-day operation of Moroccan public administrations, in particular:

- ✓ Strengthen and train the skills needed to carry out public policy impact assessments;

- ✓ Adoption of laws and regulations emphasizing the need to carry out impact assessments of public policies.

- ✓ Raising awareness among public decision-makers of the vital importance of impact assessment in the analysis and management of public policies;

- ✓ Broaden and strengthen the remit of the various players involved in the evaluation of public interventions on a regional level, based on the following principle: « All public action must be systematically evaluated »;

- ✓ Integrate impact assessment of public policies into accredited academic training courses at universities, to encourage the training of national experts in evaluation, rather than relying on foreign experience;

- ✓ Stronger political will to create a healthy environment conducive to the development of a culture of measuring the impact of public policies on the population concerned;

- ✓ Develop and design public policies based on a prior diagnosis based on internationally recognized criteria in the field of public intervention (relevance, coherence, etc.).

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[1] Ministry of Investment, Convergence and Evaluation of Public Policies

Conclusion

To conclude this article, we can say that, faced with public demand for an assessment of the effects of public interventions, the question of evaluation is logically beginning to impose itself on public decision-makers to support their decisions and justify the allocation of financial resources.

This research has enabled us to highlight the current state of play with regard to the anchoring of the practice of impact assessment of public policies in the Moroccan context. Secondly, we have empirically identified the major difficulties preventing the promotion of this practice in Ministerial Departments, Local Governments Public Establishments, and Enterprises.

This first line of inquiry has enabled us to deduce empirically that, despite its remarkable evolution and significant achievements, the practice of impact assessment faces obstacles to its institutional and organizational development in the Moroccan context. Indeed, this practice suffers from five major difficulties that make its institutional promotion difficult.

Despite the relevance and significance of the results obtained from our empirical investigation, this is also our first attempt to analyze the degree of integration of the practice of public policy impact assessment in the Moroccan context, by pinpointing the main obstacles influencing its institutional realization.

It is traditionally recognized that for any scientific work, limits can be identified and figured out and that these constitute a path and a motivation for the realization and pursuit of more in-depth future research to broaden knowledge on the subject undertaken.

In our case, to achieve this end, more solid econometric analysis and empirical expansion seem important, and they can constitute a logical continuation of our research work to enrich the studies carried out on this kind of research topic and produce rigorous and scientifically valid results.

Bibliographic References

[1] **Angrist J.D., Imbens G.W. & Rubin D.B. (1996).** Identification of Causal Effects Using Instrumental Variables. *Journal of the American Statistical Association*, 91(434), p. 444-455.

[2] **Arcand, J.-L. (2014).** The (Lack of) Impact of Impact: Why Impact Evaluations Seldom Lead to Evidence-based Policymaking: *Revue d'économie Du Développement*, 22(HS01), 289-311. https://doi.org/10.3917/edd.hs01.0289.

[3] **Ashenfelter O. (1978).** Estimating the Effects of Training Programs on Earnings, *Review of Economic Studies*, 60(1), pp. 47-57.

[4] **Bencheïkh, A. (2021).** Études d'impact et politiques publiques au Maroc de Mohamed Harakat (dir.). *Les Cahiers d'EMAM*, 1–22. https://doi.org/https://doi.org/10.4000/emam.3902.

[5] **Berrada, M. F. (2019).** L'évaluation des politiques publiques par la Cour des Comptes au Maroc. *Revue de finance et finance internationale.* pp.18-30.

[6] **Bonnet, B., M. Banzhaf, P.N. Giraud & M. Issa. (2004).** Analyse des impacts économiques, sociaux et environnementaux des projets d'hydraulique pastorale financés par l'AFD au Tchad, AFD, Paris.

[7] **Cling, J.P. Razafindrakoto, M. & Roubaud, F. (2009).** L'évaluation d'impact des politiques publiques : enjeux, méthodes, résultats. Les Journées de Tam Dao : Nouvelles approches méthodologiques appliquées au développement, *Editions The Gioi*: Hanoi, p. 16-47.

[8] **Elfathaoui, H. (2020).** Essai d'évaluation de la performance des politiques publiques en matière d'urbanisme, *Revue d'économie, gestion et société*, N26.

[9] **Geneviva, Ricardo, FARAH, & Marta F. S. (2012).** Evaluation, information, and accountability in the public sector. *Journal of Business Administration*, 46 (4), p. 993-1016.

[10] **Grawford, A. (1998).** Partenariat et responsabilité à l'ère managériale. Retour sur l'expérience britannique », *Les Cahiers de la sécurité intérieure*, n°33, 1998, pp. 51-87.

[11] **Hadefi, A.Z. & Elagag, M. (2020).** Techniques d'évaluation des politiques publiques : Une revue de littérature. *Revue Ajouts Économique*, 04 (02), pp 227-246.

[12] **Harakat, M. (2006).** L'évaluation des politiques publiques : Réflexions sur l'impact de la bonne gouvernance sur le processus de l'innovation sociale. *La Revue Marocaine d'Audit et de Développement,* n° 22, p. 15.

[13] **Jacob, S. (2005).** L'institutionnalisation de l'évaluation des politiques publiques en Belgique : entre balbutiements et incantations. *ln. Res Publica. Revue de science politique*, 46 (4).

[14] **Jacob, S., Speer, S., & Furubo, J. E. (2015).** The institutionalization of evaluation matters.

[15] **K. El Moutaouakil & A. Baguare. (2023).** Cartographie des évaluations d'impact réalisées au Maroc de 1999 à 2021. *African Scientific Journal*. 3(21), pp 929-945, https://doi: 10.5281/zenodo.10529164.

[16] **Korso Tlemsani, I. & Belkharoubi, H. (2021).** L'évaluation des politiques publiques : concepts, méthodes et analyse du cas de l'agence nationale de soutien à l'emploi des jeunes. *Revue algérienne d'Économie et gestion*, 15(01), pp 999-1018.

[17] **Lemieux, V. (2002).** L'étude des politiques publiques : Les acteurs et leur pouvoir. *Presses Université Laval*.

[18] **P.J. Gertler, S. Martinez & al. (2011).** « L'évaluation d'impact en pratique ». Banque Mondiale.

[19] Pauline Givord. (2014). Méthodes économétriques pour l'évaluation de politiques publiques. *Économie & prévision,* 1-**28.**

[20] **Petit, J.M. & al. (2019).** Évaluer l'impact d'une politique publique au moyen d'une méthode contrefactuelle : Quelles conditions ? Institut Bruxellois de Statistique et d'Analyse, Focus N°29.

[21] **Rubin, D. (1974).** Estimating causal effects of treatments in randomized and nonrandomized studies. *Journal of Educational Psychology*, 56, 688-701.

[22] **Stern, E.& al. (2012).** « Broadening the range of designs and methods for impact evaluations. Report of a study commissioned by the

Department for International Development », DFID Working Paper 38, London.

[23] **Steve Jacob & al. (2015**). Updating the International Atlas of Evaluation 10 years later. Evaluation, *Sages jouranls*, 21(1), 6–31. https://doi.org/10.1177/1356389014564248

❖ **Texts & official documents**

✓The 2011 Moroccan Constitution;

✓Organic law no. 111-14 on the regions.

Analysis of the efficiency of financing mechanisms for SMEs in Morocco between commercial banks and participatory Islamic banks

1st EL KOTBI Mohamed
Researcher in economics and management
Laboratory of Economics and Management of Organizations
Ibn Tofail University of Kenitra - Morocco
mohamed.elkotbi@uit.ac.ma

2nd ZIKY Rachid
Economics researcher, Laboratory of Entrepreneurship, Finance and Organisational Management
University Ibn Zohr of Agadir - Morocco
ziky1987@gmaiol.com

3rd BAHIDA HICHAM
Economics researcher, Laboratory of Economics Sciences and Public
University Ibn Tofail of Kenitra - Morocco
bahida1hicham@gmail.com

Abstract:
Research on the theme of firms in general and small and medium-sized firms specifically are of great interest. Because of the place and crucial role it plays in the socio-economic development of states around the world. By highlighting our research work on the Moroccan reality, it clearly appears that despite the initiatives and efforts deployed to promote and encourage the access of this category of firms to traditional commercial bank financing, on the other hand, there is a set of obstacles and financing difficulties that it faces and thus stand as a barrier to its effective and continuous involvement in the economic development. Based on this observation, our research objective is to examine crowdfunding and present solutions to effectively respond to the problem of financing small and medium-sized businesses in the Moroccan context. Therefore, our research question can be posed as follows: To what extent can participatory financing be the ideal solution to address the problem of financing SMEs in Morocco? To answer this question, we will adopt a methodology which is based on an analytical study of the financing of medium and small businesses in Morocco between the periods 2002 and 2022. The analyzed results show that Moroccan participatory banks have an important and effective role as a positive contributor to addressing the problem of financing SMEs.
Keywords: SMEs, bank financing, participatory financing, Moroccan participatory banks.

Introduction

Small businesses play a crucial role in the economy of countries and people, and the matter is increasingly important in the countries of the Arab world, as an effective economic tool that contributes to the development and economic take-off of countries, they have their own needs that differ from large projects, a good number of developing countries and those on the path of growth and even developed have focused a large part of their efforts on the development of these institutions and development that has seen them as craftsmanship and creativity, and encouraging young people to enter into their various fields.

Looking for successful models of young entrepreneurs in our country, Morocco, we find that there are some distinguished models. It was able to develop its small projects, was able to establish itself in the local market, and achieved good results that enabled it to expand its activities increasingly. However, this outcome remains very weak for many reasons, foremost among them the problem of funding and its many obstacles. In view of the importance of entrepreneurship in the economy of peoples and countries, economists and legal scholars believe that the growth and development of the activities of firms with small projects and the stimulation of their emergence as well as their rehabilitation, are considered to be the most crucial determinants of the process of sustainable and healthy socio-economic development in developing countries, as being an essential starting point in order to increase productive capacity, on the one hand, and to participate in reducing unemployment and poverty rates on the other hand. It is for this reason that many countries have attached importance to these projects and given them assistance and support under multiple programs, modalities and services available (Al-Daas & Al-Jaarat, 2014; Alaa Mustafa Abdel Maqsoud, 2017).

Aware of this fact, the majority of developing states have concentrated their efforts on this type of projects, encouraging the creation of industrial firms, particularly after they have demonstrated their efficiency and their ability to solve major problems. Small and medium enterprises are living today many difficulties and challenges that stand as an impregnable barrier to their growth, prosperity and continuity, including in particular the difficulty of accessing bank financing, in addition to the weakness of self-capabilities, the high-risk rate, and insufficient guarantees (Al-Bakri & Al-Safi, 2010). Focusing on our country, it is clear that SMEs occupy a key place within the country's economic system, representing 96% of the Moroccan entrepreneurial fabric. However, this numerical importance conceals behind it a set of difficulties and constraints that it faces, thus preventing its activation and development, foremost of which are financial difficulties and the accompanying multiple real constraints, such as access to real estate, the poor level of education and training of the workforce, the weakness of its organizational structure, unfair competition for the informal sector, tax and administrative obstacles, and others. Despite the existence of these diverse and difficult constraints, the difficulties of financing remain the most important, the latter is the one that formed the basic research material to talk about in some of its major features.

Search problem: This research discusses the following problem: To what extent can participatory financing be the best solution to address the problem of financing SMEs in our country? Research plan: Based on this previous pivotal problem and the questions that arise from it, we tried to adopt a systematic plan based on it.

The first topic: We stood on the manifestations and limited bank financing for small and medium firms, we addressed the problem statement of the reality and constraints encountered by SMEs to receive bank financing (first requirement). This analysis was mainly for us to explore the prospects of overcoming the disadvantages and limitations of traditional commercial bank financing, and to study what participatory financing can offer as a financing alternative to our companies, which would accompany them in the rehabilitation process and strengthen their competitiveness (second requirement).

The second topic: We dealt with the manifestations and reasons for the limitations of traditional bank financing for SMEs, considering that the Moroccan banking system has known a set of reforms, among its objectives was to develop a free modern system capable of securing the mobilization of savings, and the allocation of funds more effectively. This mobility, in addition to reducing the cost of funds, will also improve the investment conditions of enterprises, more particularly SMEs, which have benefited from a set of mechanisms.

However, by assessing the effects of the reforms introduced by the regime in Morocco on bank financing for small businesses, it is possible to identify the manifestations of the limits of these reforms and their inability to provide quantitative and qualitative financing for this segment of firms (first requirement).

The reformist limits referred to are mainly due to a set of reasons, some of which we have worked to highlight through an analysis of the financing relationship between the two parties (second requirement).

The utilitarian orientation of banking institutions through their exaggeration in asking their customers to provide guarantees, especially those related to the financial disclosure of the enterprise, would affect the high cost of financing directed to SMEs (third requirement).

1. Manifestations and reasons for limited bank financing for small and medium enterprises

This research theme aims to show the most prominent manifestations and reasons for the limitations of traditional bank financing for SMEs, considering that the Moroccan banking system has known a set of reforms, and to assess the effects of the reforms that the system has known in Morocco on bank financing for small businesses, as well as the extent of their limitations and their inability to provide quantitative and qualitative financing to this category of businesses (first requirement).

While the second part of this section discussed the reformist limits referred to and the statement of their causes, and highlighted some of them through an analysis of the financing relationship between the two parties (second requirement).

1.1. The reality of limited access of SMEs to bank financing

Within the framework of the financing activity of banks, we find that there are sectors and economic actors who enjoy a large share in the distributed financing, and our SMEs remain outside this segment. This is what we found through a close reading of the proceeds of its bank financing until 2017 (World Bank, 2022), whether related to conventional loans and self-employment support loans, or those related to rehabilitation financing formulas and guarantee funds, and through this vision it is possible to come up with the following observations:

-*Firstly:* The decline and weakness of the volume and effectiveness of loans allocated to finance small and medium enterprises.

This can be confirmed by the study carried out by the Directorate of Economic Prospects of the Ministry of Finance, regarding the evaluation of the financing proceeds of SMEs in Morocco, during the period between 2002 - 2019, and until 2022 (Bank Al-Maghrib BAM, 2022), the matter continued in the same way with a slight change that did not include all enterprises well and sufficiently to qualify and develop them, which was revealed by the data issued by the National Office of Industrial and Intellectual Property (ONPI), on the total annual financial outcome of Moroccan companies. During 2021, especially after emerging from the Corona pandemic COV-19 (World Bank, 2022). Moroccan businesses declined to rely on financial loans to manage their management affairs and their expansion projects, and the Moroccan Situational Center explained that enterprises in Morocco still live many constraints that limit their productivity, inhibit their development, and limit their resilience...In his latest report on the outcome of the fiscal year 2022 and the prospects for 2023-2024 (Jouahri, 2022), he said that despite the efforts made by the state in recent years to increase the value of Moroccan enterprises and further strengthen the business space in which it is located, it continues to face several constraints, namely the difficulty of accessing financing loans, the lack of creative and innovative capacity, the lack of financial support for research, the strong competition coming from the informal sector, the high costs related to production, especially labor wages, in addition to of course - to the phenomena that fall within the circle of administrative and financial corruption (Wardi, 2011 & 2014). Perhaps what worries Moroccan entrepreneurs in the first place is the problem of access to finance, as it negatively affects start-ups and small businesses. The report confirmed that the volume of loans provided by banks to create enterprises declined between 2005 and 2022, from 65% to stand at the threshold of 42,5%, which is equivalent to a decrease of 13 points, noting that the contribution of banks in contracting remains dominant. At the same time, loans allocated to the public sector increased from 5% in 2005 to 12% in 2022, an increase of 7%, and loans directed to SMEs

did not exceed the threshold of 20% in terms of loans, despite the efforts made since 2010 to finance them, as the entrepreneur usually has to rely on his own funds to strengthen the company's capital. Several international research and studies centers have concluded that one Moroccan company out of five cites corruption as the first obstacle to its inception, compared to only 9% of companies in the Middle East.

Although Morocco improved its score by nine points between 2017 and 2021 globally in the Corruption Perceptions Index, moving from 81th to 75st place in 180 countries, corruption is a nightmare for Moroccan businesses[1]. The final statistics of the performance of Moroccan companies revealed that (3460) companies declared bankruptcy during the year 2020 due to the difficulties they face, representing an increase of 15% compared to the previous year, with the bankruptcy of about (780) new companies recorded in December alone, compared to (450) companies that went bankrupt in December 2019. Several recent studies and scientific reports on the economic aspect in Morocco have confirmed that the general economic policy of the State highlights its continued response to the international trusteeship of donor institutions and the adoption of a policy of investment in which huge amounts of money are wasted in projects of the African orientation instead of mobilizing "billion balances" in the fragile national economy in its various aspects[2].

From these official and accurate data, it is clear that the policy of reviving SMEs in Morocco is counterbalanced by a weak mobilization of bank loans. Weak medium- and long-term financing is pushing SMEs towards short-term "easy" but costly borrowing. The Fund's facilities constitute more than half of the total debts of these enterprises, which would negatively affect their financial structure, which banks use as a pretext for refusing to provide them with the necessary loans so that the financing of our SMEs remains in the vicious circle of development and keeping pace with development (El Khir, 2010).

-*Secondly*: Weak Effectiveness of Self-Employment Support Loans (Moukawalati Program Model).

According to the latest statistics issued by the Ministry of Employment, this program enabled the creation of only (6500) small enterprises between the years (2012-2022), the Ministry attributed this to the failure of banks that did not contribute to financing only 54 projects in 2020 compared to more than 380 in 2019, and then since the beginning of the adoption of the program, banks have financed only 42% of the total youth holding projects,

which have been showing increasing caution, justifying their refusal not to provide young people with viable projects (Bank Al-Maghrib BAM, 2022). For funding.

- *Thirdly*: The limited exploitation of the weak exploitation of guarantee funds and foreign lines to finance the rehabilitation of SMEs.

The search for new sources of financing for SMEs has led to the establishment of a group of guarantee funds as well as joint guarantee funds, aimed at accompanying the latter in the rehabilitation efforts. In addition, other financing lines with an external source came either through signed agreements, in addition to that, other financing lines came with a source, within the framework of the partnership with the European Union or the relations between our country and other countries, to accompany small and medium enterprises for rehabilitation and others were announced within the framework of industrial take-off programs for two basic measures to promote SMEs, the first program aims to accompany the enterprise in its efforts to modernize and improve its profitability (Musanada program). Second, Fermi aims to help her obtain financial support from Moroccan banks (Imtiaz program). However, by studying the latest outcome of these various mechanisms, we can conclude the limited support for financing SMEs, which is reflected in the following:

-*Fourth*: The modest proceeds of guarantee funds and joint financing.

In order to contribute to solving the problem of financing and qualifying SMEs, the so-called "guarantee funds" as well as "co-financing funds" have been solved, which are funds whose main purpose is to facilitate the access of these enterprises to bank financing through the guarantee of loans granted by banks (Enterprise Qualification Loan Guarantee Fund, Debt Structuring Fund "Continuation"), or jointly with the bank concerned in financing a company that meets the conditions for benefiting from These funds (the National Fund for the Rehabilitation of Enterprises, the Textile and Clothing Sector Contracting Structure Fund, the Hotel Unit Modernization Fund, and the Industrial Depollution Fund). With regard to the proceeds of these funds, we provide the following scientific data: As for the National Fund for the Rehabilitation of Enterprises: the number of projects benefiting from it reached sixty-seven (420) projects, while only 41,75% of the allocated budget had been exploited, as of October 2019 (Bank Al-Maghrib BAM, 2022).

- As for FOODIP, (290) projects had been funded, and by the end of 2019, only about 53,4% of the total grant amount had been utilized.
- As for the Hotel Units Modernization Fund, 60% of the financing of (62) projects were accepted, while the share of bank financing amounted to one, as of January 13, 2019.
- As for the Bank Debt Structuring Fund (Continuation): (45) MMAD liabilities have been secured for the benefit of (57) companies until the thirty-first of December 2019.

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[1] The Situational Center paints a bleak picture of the reality of Moroccan entrepreneurship: weak financing, innovation, and heavy taxes are factors that threaten startups with bankruptcy, Al-Ittihad Al-Ishtiraki newspaper, dated: July 16, 2022.

[2] Morocco report in 2022, completed by: Economic and Financial Studies Unit.

As for the Financial Support Fund for very small and SMEs, which was launched at the initiative of Bank Al-Maghrib, the Professional Group of Moroccan Banks and the Central Guarantee Fund in June 2019with the objective of strengthening the financial balance of micro and small firms, as well as enabling them to contribute to economic growth, it was known at the beginning of its launch a tangible contribution to guaranteeing the loans granted to these enterprises, exceeding three (3) billion dirham's for the benefit of (560) companies, but this activity soon witnessed a significant decline of (-30%), with regard to Financing the Central Guarantee Fund, at a rate of (-30%) for loans granted by commercial banks (Bank Al-Maghrib BAM, 2022).

It is worth noting that in 2017, the "Logistics Qualification" program for SMEs was launched for the benefit of about 600 SMEs with a financial cost of 63 million dirham's, and in this regard a partnership agreement was signed to activate this program. This program, initiated by the Moroccan Agency for the Development of "Logistic)s Activities" in partnership with the General Confederation of Moroccan Enterprises (CGEM), falls within the framework of the activation of the national "logistics strategy", especially the axis related to the development of efficient and integrated "logistics operators", and extends for the period (2017-2024) with a first phase (2017-2020), and as officials told him, it translates the common will of public and private sector actors in order to make "logistics" a pillar and lever to improve the general competitiveness of Moroccan SMEs in an international environment characterized by great economic competition. From these recent data, it is clear that the total burdens of the Central Guarantee Fund in its relationship with the various guarantee funds are modest, compared to the needs of strengthening and supporting the entrepreneurial fabric, a large part of which remains on the margins of the rehabilitation process (Bank Al-Maghrib BAM, 2022).

We take here, for example, the "Financial Support Fund for very small, small, and medium enterprises," which, through its terms, shows that it re-supports strong enterprises that face temporary financial difficulties, thus excluding a large segment of enterprises that are in the process of growth, and that may need support. Mali to raise its level and stability in the world of economics and regional and international changes. Therefore, this remains tangible evidence of the banks' reticence in dealing with the guarantee system in order to finance small and medium enterprises, especially financing investment needs and supporting the competitiveness of enterprises, which of course need long-term financing (Salhi, 2013).

-*Fifth:* Poor exploitation of foreign financing lines.

Until the end of 2019, only 68,5% of the total budget for these lines had been committed (Bank Al-Maghrib BAM, 2022).. The weak use of foreign lines of credit can be explained by a number of reasons, perhaps the most prominent of which are the following:

The first reason: lies in the weakness of mediation, especially before the establishment of the National Agency for the promotion of SMEs.

The second reason: It is represented by the lack of incentive for Moroccan banks, which prefer to offer their own financing products that they are proficient in using, and reap significant profits from that, instead of engaging in heavy and poorly profitable procedures.

The third reason: It is evident in the weight of the procedures and the nature of the conditions for the loans granted within the framework of these lines. From the above, it becomes clear to us that:

1) The limits of bank financing for SMEs are not due to the lack of financing mechanisms, but the problem lies in the difficulty of accessing this financing in order to benefit from these resources, which is also criticized for not keeping pace with the various stages of the enterprise's development and the needs it produces special financing.

2) These manifestations of limited financing are not a coincidence, but rather result from a set of reasons and factors controlling the relationship of SMEs with banks, and the resulting effects on determining the frequency and type of bank financing from which these enterprises benefit.

1.1. The fragility of the relationship between SMEs and banks, or the reasons explaining the limited bank financing

The difficulty of small and medium enterprises accessing bank financing has been - and still is - the subject of intense debate in Morocco. On the one hand, enterprises complain about banks' caution and their weak interest in financing them, while banks answer that the reason is the poor quality of investment files and loan applications. These manifestations reveal the fragility of the "credit" relationship between SMEs, and the matter becomes clearer to us if we know the circumstances under which loans are granted by banks, and the latter's high cost (Balaji, 2016). In this context, we should explain this problem and the reasons leading to it through the following sections:

1.1.1. Banks' caution and fear regarding financing small and medium enterprises

The controlling reasons: Banks are often afraid to grant loans, especially to companies with a fragile financial structure, due to the risks of failure in performance that could result from this (Al-Shawarbi & Al-Shawarbi, 2007). This view is based on reasons, including:

- *Firstly*: The weakness of the structure of SMEs:

As is known, there are two sources of financing, namely: permanent financing consisting of personal capital and financing debts, then short-term debts that can be from a commercial source in the form of performance facilities granted by suppliers. Or from a bank source. Own capital is

considered synonymous with the enterprise achieving financial independence, with the resulting reduction in credit risks. However, by analyzing the composition of the financial structure of these enterprises, we notice a weak percentage of these funds, compared to a high percentage of short-term debt, which is an increase controlled by a group of reasons.

- The predominance of term deposits within banks' resources, which prompts them to be keen to carry out short-term transactions.

- The importance of working capital needs and periodic financing within small and medium enterprises. Given that there is - often - a difference between the period of the enterprise's spending and the availability of resources to cover these expenses, SMEs (Belletante, 2001; Masmoudi, 2006; Boulharir, 2017) in light of the inability of exploitation resources to meet these needs, resort to short-term bank loans, of which both the discount and the overdraft account constitute the most important financing resources used. It should be noted that these loans are not used only as temporary resources, but as permanent resources to finance working capital needs, which would contribute to an excessive increase in short-term debt.

- The banking approach that adopts the financial liability of the company as an important criterion in its dealings with the latter. From an economic point of view for banking sector employees, providing small and medium enterprises with long-term loans remains a task that carries with it great risks. Due to the weakness of its own funds compared to its debts.

Given the weakness of the structure of SMEs and their confusion regarding bank financing, contemporary writings have focused on paying attention to and supporting them, and moving forward in encouraging them, as they are an effective tool that drives the country's economic and social development[3].

-*Secondly:* The high degree of risk of financing SMEs from a banking point of view:

Banks often use risks related to financing SMEs to justify weakness, its financing is for the benefit of this segment of enterprises. The weak financial management of this segment of closed family enterprises, in addition to the lack of most of them on the necessary guarantees, justify the caution and reservation of banks in most cases regarding this financing. The bank, as an enterprise, is subject to a set of basic controls in its management. When he is concerned with distributing the available financial resources to various uses, he tries to choose the best possible uses. The best use of financial resources, from the Bank's point of view, is one that responds to many financial and non-financial considerations.

The first is more related to the criteria of profitability, return and liquidity. As for the second, it actually constitutes one of the sources of threats to the bank, represented by the changes that may occur between the moment the loan is granted and the moment it is recovered.

For the bank, the risks of financing SMEs, with one name, are often represented by a decrease or final loss of profitability, especially since this type of enterprise remains weak in the face of the changes that may occur in its general environment, and what economic policy may determine. From profound transformations on more than one level (economic modes of production, rhyming values, social traditions, etc.). The risks here are more related to the returns and the degree of balance of the financial structure, as well as to the changes that could affect them, which is not favored by many interested people who see the possibility of the failure of an investment project based on an - in principle - good financial structure. The expectation of a high degree of risk in financing small and medium enterprises by banks affects - without a doubt - the ways in which they study and accept the loan files submitted by the latter, and this is what I discussed in the next request.

1.1.2. The ineffectiveness of the approved methods for accepting loans to SMEs

The bank, whatever the sources of its resources used, wants to employ the latter in a way that preserves them and ensures their safety. This becomes necessary when it comes to using the resources of others. However, what is wrong with commercial banks in Morocco is their adoption of a classic approach in studying loan files and their exaggeration in requesting guarantees.

-*Firstly:* Adopting the traditional approach in studying bank loan files

Every day, banks examine a significant number of loan applications and make a set of decisions, a large part of which may be inappropriate. If it is acceptable to judge that the decision to grant a loan to a "bad" company is harmful, then there are also other decisions that may harm the "good" company, which are often due to not adopting good diagnostics of the company's financial situation.

To elaborate on this, we relied on the conclusions of a study conducted by a university researcher on the subject: Loan distribution strategy and diagnosing debtors' cessation of payment (Al-Kashbour, 2002) through which he attempted to study the criteria adopted in decisions to grant loans to enterprises on the one hand, and explain the determinants of the latter's cessation of payment on the other hand (Malhaoui, 2017). Thus, a distinction was made between two types of approved financial transactions and ratios, one of which One: related to exploitation activity (productivity factor, return factor), while the other, is related to the financial structure: the share of financial expenses in the results factor, the ability to repay factor, the debt factor, then the solvency factor (Al-Sharqawi, 2000).

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[3] Speeches and seminars by His Majesty King Mohammed VI, July 23, 1999, July 18, 2000, pp. 101-249, and the banking system in Morocco and the problem of financing small and medium enterprises, previous reference, pp. 190-202.

Through comparison between these factors and others controlling the default of enterprises, it became clear that among the five factors that were approved on the occasion of studying the loan file, we find that only the "debt factor" and "solvency factor" were influential in granting the latter, while they were not. The two main controllers of the negligence of the companies in question, which could constitute an injustice against a group of sound companies that did not benefit from a good classification, as a result of an incorrect assessment of risks, are the two main controllers of the negligence in performance, while the "return factor" and the "financial expenses factor" were in the shortcomings of these companies, but they did not affect the decision to grant financing.

Essentially relying on the degree of "solvency" and the level of "debt" could lead the bank to either exaggerate and over-estimate the risk of default or underestimate it, and thus classify "sound companies" among those whose financing carries a high risk, and vice versa, contributing thus the bank itself realizes the credit risk.

-*Secondly:* Banks are strict in requesting bank guarantees in Morocco.

Banks resort to requesting guarantees as one of the criteria for allocating and restricting the distribution of their resources among their customers. However, we find that this is done at the expense of SMEs, which are always required to mortgage all of their funds in order to demonstrate the fulfillment of their obligations in the future. The excessive guarantees requested by banks remain one of the most important criticisms directed at the latter. The matter will become clearer, with the data of the World Bank's report on "Assessing the Investment Climate in Morocco," which indicates that it is among the percentage of companies that requested a loan and whose files were rejected. Because 69% of them do not have guarantees[4]. As for the types of guarantees that banks often request, real estate guarantees play the role of an "entry card" to the credit market (Bank Al-Maghrib BAM, 2022).

Despite what the Central Guarantee Fund does - as a public financial institution similar to the banking institutions that were created in 1949 - it contributes, as a state mechanism, to stimulating private initiative by encouraging the creation, development and modernization of enterprises, in addition to supporting access to housing, and guaranteeing investment, exploitation and return loans. Financial structuring and other services. Although it is described as a natural partner for banks and has concluded cooperation agreements with the latter in the field of using guarantee

and joint financing products, these efforts remain minimal and do not keep pace with the desired economic development the world is witnessing. Thus, in the Moroccan reality, ownership of land remains an important condition for obtaining bank loans, which harms small and medium enterprises that often do not have this type of guarantee[5]. In addition to these guarantees, Moroccan banks tend to mobilize other guarantees, such as mortgages. For business assets, possessory mortgage for equipment. The utilitarian orientation of banking institutions, through their exaggeration in asking their customers to provide guarantees, especially those that are linked to the financial liability of the enterprise, would affect the rise in the cost of financing directed to SMEs.

1.2. The high cost of bank financing for SMEs

Small businesses have continued to bear very high interest rates, without having a share in benefiting from the most advantageous financing conditions like their large counterparts, thus being forced to pay high compensation for risks. The fragility of SMEs alone does not explain the latter's vulnerability to high interest rates. Rather, the "mismatch of information" between the two parties on the one hand and the weak negotiating position of the enterprise on the other hand, influence the high cost of this financing.

-*Firstly:* the inconsistency of information

Often, "information asymmetry" is used to indicate a situation in which information is not perceived in the same way by different actors. They may have the same information, but some of them are better aware of it than others. "Information asymmetry" remains a general problem for all external financing, which can lead a bank to grant a loan based on the same interest rate to companies presenting different risks. It could also lead to very strict selectivity in granting loans to SMEs, as well as their high cost. In Morocco, a group of SMEs remains excluded from the loan market for a long time. Because its relationship with the bank is not based on good and necessary information for the latter to anticipate risks, as long as it remains unmotivated to make its accounts more transparent, it cannot risk the tax cost in order to obtain a bank loan[6].

-*Secondly:* The weak negotiating position of SMEs in their relationship with banks

In light of the weakness of alternative financing channels, SMEs remain largely linked to bank financing. With this situation, it remains obligated to pay a large part of the fixed bank expenses associated with the provision of performance tools and consulting services. The decline in government spending on the one hand, and the decline in bank financing on the other hand, has created a difficult financial situation

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[4] The same report states that the average value of the guarantee is approximately 250% of the average value of the loan obtained. It is also one of the highest arithmetic averages yet of the Republic of Georgia, this is often explained by the difficulty, as well as the length of the procedure for verifying bank guarantees.

[5] Only 22% of small enterprises own land, according to data from the climate assessment report investing in Morocco.
[6]https://www.albankaldawli.org/ar/news/press-release /2022/11/03/climate-investments-will-reap-big-dividends-for-morocco-says-world-bank-report

for private sector institutions that are trying to organize their financial affairs to face the new situation in the market. On the other hand, reality has proven that the high cost of loans is mainly due to illegal banking practices that harm these companies. Thus - for example - using the banking year consisting of 360 days instead of 365 days, with regard to deducting interest, leads to higher rates of the latter.

Once this is done, the 18% interest will become (18% x 366 / 360 = 18,3%), which at the same time leads to converting normal interest rates to usurious ones. If the Bank of Morocco had required that the ceiling not exceed 19,26%, then by adopting a 360-day banking year, this percentage would rise to 20,15% (Bank Al-Maghrib BAM, 2022).

2. Possibilities of overcoming the problems of financing SMEs in light of the Participatory Banking Law

The current reality of SMEs in Morocco, in its relationship with commercial banks and the obstacles it knows, reveals the extent of the need to overcome the latter and work to remedy them. Here, the importance of alternative products that contribute to solving the problems of participatory finance, with their distinct characteristics and attributes, in creating and presenting them, appears financing SMEs(first requirement), provided that a set of obstacles and challenges facing their approval are removed (second requirement).

2.1. The extent to which participatory finance products are able to respond to the financing needs of SMEs

The committee stated in its decision issued in the Official Bulletin, issue No. (6548), that "the draft circular presented to it, in its final form, is consistent with the provisions of Islamic Sharia and its objectives, and there is nothing in it that contradicts these provisions, based on Sharia evidence and considered jurisprudential jurisprudence[7]." In principle, and through the characteristics of these products, it becomes clear to us that they are suitable for the needs of enterprises at the present time, as they carry within them characteristics that can respond to the needs of SMEs, which can be verified by relying on the experiences of some Islamic banks in financing the latter.

Knowing that from a practical standpoint, there is still stumbling and legitimate fear of financing this type of enterprise at the beginning of the transactions of participatory banks, according to the testimony of economists in the field. The debate is still ongoing about the extent of the ability of these banks to provide financing services for SMEs (Mourid, 2012). Private small businesses are also expected by Moroccan companies and the private sector, which is looking for

financing that, is compatible with the provisions of Sharia. According to the opinion of specialists, participatory banks - similar to traditional commercial banks - only finance enterprises that have the ability to pay, while financing these banks for individuals is easy. Through high guarantees, such as mortgaging real estate and other legal methods, and even companies that have strong guarantees, it is easy for them to benefit from bank financing, but with regard to financing companies, the matter is difficult, because it relates to their monthly and annual income and assets: are they large or not? Taking into account its material value in all cases.

2.1.1 The suitability of participatory financial products to the financing needs of SMEs

Participatory (Islamic) banking financing is either by sharing funds that may not be available to the customer, or giving the customer the money as a form of speculation according to Islamic law, or intervening in trade by increasing the customer's trading capital (goods) or at least leasing machinery and equipment and other forms of benefit. That is, financing is the provision of money to be a participating share in capital, or it is the direct purchase of goods to be sold to a purchase orderer. Hence, it is necessary to research participatory financing formulas for small and medium enterprises and compare them with others[8].

-Firstly: Murabaha financing formula and its suitability for SMEs

Murabahah in language (Heni, 2003). : It is derived from "profit", and profit is growth and increase, and in trade: it is the positive difference between the cost achieved when he sold his commodity on a Murabaha basis and it is said: a Murabaha sale, and it is also said: I made a profit on the commodity and its selling price, so if I sold it then I gave him a known profit. The jurists - despite their different schools of thought - have agreed on the concept of the Murabahah sale, as it does not deviate from being "a sale equivalent to the first price for which the commodity was paid in the hands of its owner (i.e. the seller) and an increase in a known, agreed-upon profit."

What is meant by the first price of the commodity is the cost of obtaining it, which is equal to the purchase price plus the elements of the costs spent on it contemporary researchers have defined it as: "the sale of a commodity for the capital it was made with, plus an agreed-upon known profit...", meaning: a sale for more than the capital. Murabaha sales are included in trust sales. Because the seller is entrusted with informing him of the price at which he purchased the item (Ben Hafou, 2015).

- Definition of the Murabaha sale contract:

It is an agreement between a buyer and a seller for the purpose of selling a specific commodity that the seller may

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[7] Opinion of the Sharia Committee for Participatory Finance of the Supreme Scientific Council, No. (3), date: December 10, 2016, Official Gazette, No. (6548), pp. 639-641

[8] Royal Decree No. 1- 02 -188 issued on Jumada al-Ula 12, 1423 (2002), implementing Law No. 5300, relating to the Small and Medium Enterprises Charter, Official Bulletin, No. 5031 (February 19, 2002), pp. 1-2368.

have or provide to resell it to the buyer, according to specific specifications for the commodity and on the basis of a price that represents the cost plus a profit margin agreed upon by both parties. Delivery may take place immediately or after a deadline, and payment may also be made. In cash or in installments. This type of modern sales has been widely used in Islamic banks as one of the means of financing internal and external trade, by purchasing the commodity that the customer requests from the producer, and then the bank sells it to him after it is actually received.

The Murabaha system in participatory banks depends on the participatory (Islamic) bank purchasing the goods and commodities requested by the customer with the Islamic bank on the basis of the requester's commitment to buy what he ordered according to the cost price with the addition of the wind agreed upon according to the bank's regulations. These are the ratios that average between 8 and 10% usually if calculated on the annual basis of capital return. Given that this percentage is lower than the actual profit that can be obtained through participation, the management of the Islamic bank may see the possibility of creating a new contract in the form of a Murabaha company according to specific rules (Bank Al-Maghrib BAM, 2022).

The importance of this contract - i.e.: Murabaha - lies in the fact that it is not usurious, and despite the fact that this process is relatively expensive, it is free from usury (Al Khamlichi, 2010), its flexibility, and its coverage of various fields and sectors, in addition to the fact that the bank adheres to the theory of risk and the rule of (the sheep with the share), which is what It is not available in usurious (traditional commercial) banks.

-*Secondly:* The leasing financing formula and its suitability for SMEs

IJARA[9], as defined by the Participatory Banking Law (Murad, 2000), is: Every contract under which a participatory bank places, by way of rent, a specific movable or immovable property in the ownership of this bank at the disposal of a client for the purpose of a legally permissible use. Given the advantages of this formula, it is - in principle - capable of reducing a number of financing obstacles for small enterprises, including:

1) Overcoming the problem of guarantees that SMEs lack

The leasing formula limits the credit risks related to the inability to collect installments, due to the sale being coupled with the leasing formula. Legally and legally, ownership of the leased property remains in the hands of the lessor, and if the customer stops paying or becomes bankrupt, the lessor recovers the leased property.

The ownership of the production unit by the Participatory Bank is one of the most important forms of guarantees, which contributes to overcoming the most important obstacles of enterprises that do not have guarantees.

2) Meeting the financing needs of the exploitation cycle of SMEs

The leasing contract allows the enterprise to allocate its available funds to finance its exploitation cycle over a period that is generally longer than that allowed by other financing methods. Thus, it meets the needs of owners of SMEs who do not wish to access traditional commercial bank financing, either because they want to obtain financing for the longest term, with installments according to their profit expectations, or because they are unable to obtain this financing.

-Thirdly: The formula for participatory financing and its suitability for SMEs

According to the requirements of the new law
for participatory banks, a participation contract is: "Every contract whose purpose is for a participatory bank to participate in a project with the aim of achieving a profit."The parties participate in bearing the losses within the limits of their contribution and in the profits according to pre-determined ratios between them.

Participation may take one of the following two forms:

1) Fixed participation. This participation is also called permanent participation or "participation in the project capital."

2) Diminishing Musharaka: This is the alternative formula for financing with long-term loans in usurious banks. This is because the contribution means: the continuity of the diminishing participation, which suggests that the bank will exit after a certain period in a gradual manner within the framework of an organized and agreed-upon arrangement. Accordingly, the decreasing contribution represents a means of financing medium and long-term investments in all areas of investment and development: the bank gradually withdraws from the project according to the terms of the contract.

The methods of managing a group of companies make them far from gaining the trust of the bank, while this type of financing, which is based on creating a long-term relationship between the two parties, in which the bank plays an effective role in managing the project, also remains a means of long-term financing for SMEs.

-*Fourth:* The Mudaraba financing formula and its suitability for SMEs

The Mudaraba formula is a form of establishing and organizing investment projects, in which the speculator undertakes management, while the joint-venture bank secures the financial and material resources necessary to establish the project, and the profits are distributed between the bank and

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[9] Recommendation of the Bank of Morocco, (2007). No. 33/9/2001, related to IJARA, Musharaka and Murabaha products.

the employer in an agreed-upon ratio, and if a loss occurs, the bank bears it in the event that the speculator does not default. And without violating the agreed upon terms of speculation. Therefore, this formula, with its many advantages, is able to confront the obstacles of traditional commercial financing for SMEs, and this is evident to us through the following:

- Reducing the problem of guarantees, as the guarantees here are not in-kind or personal guarantees, but rather they are more related to the product, the market, and the personality of the contractor, which must be taken into account.

- Overcoming the problem of lack of sufficient financing for the enterprise.

-*Fifth:* The ladder financing formula and its suitability for SMEs

Ladder is an investment contract according to which the enterprise's production or expected agricultural crop is pre-purchased in exchange for the selling company obtaining advance financing through which it carries out its production or commercial activity. This formula is more suitable for agricultural projects for small farmers, as well as financing artisans and small industries.

This formula, with its advantages, can play a role in providing cash liquidity to these establishments, through the bank purchasing the company's production, with the original ladder contract (cash payment and deferred receipt), or concluding agreements with companies that use the production of small companies as components of their final product and selling it to them through Parallel ladder contract or agreement with some of its clients (distributors) to sell them the final products of the contracting companies either as a parallel ladder or Murabaha. This highlights the significant role that this formula can play in financing the working capital of these companies

-*Sixth:* The formula for Istisna financing and its suitability for small and medium enterprises

Contracting companies can be financed using the Istisna method in two forms:

- The first: Under which the bank, in cooperation with the authorities concerned with SMEs, conducts a study of the local and foreign markets to determine the goods that are most popular and most suitable for consumer tastes and requirements, as well as searching for new goods or existing goods with improvements to them and promoting them to attract investors and finance them through the Istisna contract. The bank assigns the manufacturing of these goods to several SMEs.

- As for the second: Under it, the bank manufactures the commodity through one of the companies and then leases it as a financial lease to small enterprises.

2.1.2. The reality of participatory financing's response to the needs SMEs in Morocco

Among the effects of SMEs weak internal funds is their inability to finance fixed capital. Thus, on the one hand, it is more complicated for these firms to use the financial market, as well as the difficulty for them to obtain forms. Traditional commercial bank financing (where it remains either unable to fully finance fixed capital, or is caught up in a debt that it may not be able to fulfill...), on the other hand, reveals the importance of leasing operations or diminishing partnership operations, as well as Murabaha.

From the practical aspect of financing projects, especially SMEs ones, we find that Murabaha has been able to serving thousands of owners of these projects, through which they were able to obtain financing directly related to their productive activity, with conditions hundreds of times better, and not even comparable to the conditions of traditional financing.

Regarding leasing: experience has proven its flexibility - albeit relative - and its ability to respond to needs SMEs, despite their high cost. We now come to the solutions that these products can provide regarding the problem of guarantees, and it is noted that by studying this aspect, the rest of the hypotheses presented were verified.

It is known that the issue of insurance is related to the recruitment process and the nature of the risks to which one is likely to be exposed.

The nature of the risks to which the bank is exposed in the case of financing with traditional loans differs from those to which it is exposed in the case of financing with the aforementioned alternative products.

The risks facing the bank in the first case are the risks of non-compliance with payment, and therefore the necessary guarantees must be provided. The quality of the guarantee must ensure that he recovers his rights (in-kind and personal guarantees).

The relationship here between the two parties (the company and the bank) is that of creditor and debtor. On the other hand, in the context of participatory financing, we find that its nature is a relationship of sharing in profits and losses (especially in light of the participation contract), and in light of this, the risks here are not only due to the possibility of the client not committing to repay, but are also related to the quality of the investment process.

The first of these risks to which the bank may be exposed in this regard comes from the investor client requesting financing. It represents an essential element for the success or failure of the investment process, as some of it is due to its technical and administrative incompetence, while others are due to its dishonesty and its attempt to falsify documents. Hence, the nature of the guarantees that must be available here must be appropriate to the nature of the risks.

It is clear from the above that the guarantees necessary to confront this type of risk are concentrated around two types: basic guarantees, which are the availability of ethical and practical competence in the customer, and complementary guarantees, which are: personal guarantees, and real guarantees.

2.2. The challenges of participatory banks in facing the expectations of SMEs

In contrast to the difficulties and obstacles presented by traditional bank financing, SMEs are showing widespread interest in participatory products, despite the failure of the experience with alternative products. The Economic, Social and Environmental Council revealed that "the contribution of this type of product to the total bank deposits did not exceed 3,4%." In late 2022, according to a field study conducted by a researcher that focused on small and medium enterprises in our country accessing alternative banking products, only 24% of the approved sample used these products (Bank Al-Maghrib BAM, 2022).

This is what was revealed by a group of field studies, which examined on the ground the expectations and aspirations of these companies regarding the process of participation banks entering the Moroccan banking market. Before moving on to monitoring the challenges that participatory banks must raise in order to win the bet of contributing to the development of the enterprises in question, we first briefly explain the most prominent of them in the following topics:

2.2.1. The expectations of SMEs from the entry of participatory banks into the banking market in Morocco.

Based on the data of the two field studies that monitored the expectations of SMEs from participatory financing in our country, we came up with this focused conclusion, shown in numbers in the following table:

Table 1. A brief table synthesis prepared by the authors (based on the data and results of the two studies

Expectations of SMEs	Study No. (1)			Study No. (2)		
Reducing the cost of financing	97,4%			61,2%		
Desired types of financing	Murabaha	Musharaka	Mudaraba	Murabaha	Musharaka	Mudaraba
-	19,5%	8,2%	72,3%	8,9%	64,1%	27%

Source: developed by the authors

Through a close reading of the data of these two studies, the researcher finds a number of difficulties that small and medium enterprises are still struggling with. On the other hand, there are ambitions and aspirations that the concerned enterprise would like to achieve, and some of them can be monitored - based on the available data - in the following:

The desire of SMEs to accelerate work with participatory products is not only linked to the ideological (legal) aspect, but is also linked to the desire to obtain financing at an appropriate cost, which can be produced by the competition expected to be created through the expected multiplicity of participants in the Moroccan banking market (Islamic banks - Gulf, Moroccan Islamic windows, commercial banks).

Perhaps the search for a low cost for these financing formulas explains the extent of the financing difficulties that our companies suffer from, which are mainly linked - as I mentioned earlier - to the high cost resulting from high interest rates, as well as the impossible nature of the guarantees demanded by traditional banks.

Enterprises prefer to benefit from financing through Musharaka and Mudaraba, which come in first place, followed by Murabaha and IJARA in second place. This reflects the desire of SMEs for financing in which Musharaka replaces guarantees and costly credit interest. This is what makes participatory banks invited to provide participatory financing based primarily on profit sharing, in which they play the role of partner, investor, and also the financial and administrative advisor who ensures that they accompany the project in its various stages. If it is clear to us from the above that these ambitions are the most important thing that SMEs in our country expect from participatory banks to achieve, then what are the challenges that must be raised - first - in order to respond to them?

2.2.2. Realistic challenges for participatory banks.

-*First:* The necessity of giving priority to the participatory role of participatory banks over the role of mediation:

The most important challenge that must be raised by Islamic banks in Morocco is to move away from "imitating" traditional commercial banks in how they deal with small and medium enterprises, through their refusal to bear risks, and the constant search for "safety" with regard to investing their funds.

This new category of banks must focus on their participatory and reasonable financing role, and establish a relationship based on trust and exchange of information between both parties, which are the most important factors in reducing the credit restriction that this segment of enterprises suffer from, in addition to reducing the cost of financing, which is not Many companies and sectors are still struggling with its negative consequences. In order for there to be trust and exchange of information, the bank must be seen as an effective and true partner, relying on a personalized understanding of its customer and not on procedures of a general nature that may be based on an evaluation that is not logical or accurate in some cases.

-*Secondly:* Attention to qualifying human resources for Islamic banks:

The availability of qualified human competencies is considered a major challenge for the participatory finance sector in general, as the latter's formulas require a special type of worker to be applied, to the point that the availability of this type is a major obstacle that prevents the possibility of their application. This is because the systems of operation of these formulas represent a special intellectual structure originating from Islamic jurisprudence in its connection with doctrine and transactions and Islamic jurisprudence in its connection with conditions and new developments, also, the mechanisms of work in them differ from the mechanisms of work in systems that rely on the interest rate as a basic starting point in their transactions, which calls for the necessity of the availability of qualified competencies who understand the overall Sharia rules and controls that govern the work of these contemporary transaction formulas, while ensuring their continuous training - as we mentioned-; because there are always Arab and international developments that affect the taxpayers from time to time, which requires continuous research and diligence informed by the spirit of the times that keeps pace with them.

Conclusion

Through our treatment of this thorny topic, we concluded a set of findings and recommendations, which we present in summary and focus in the following points:

1- A set of factors control the problem of financing SMEs, above all the problem of the weakness of the necessary data and communication between the two parties, the problem of exaggeration in requesting guarantees from banks, the problem of the high cost of bank financing directed to SMEs...despite the reforms coming with the necessary conditions and mechanisms. To strengthen the latter's financial capabilities and prepare it to face the challenges of the increasing openness of the Moroccan economy, he was unable to influence the behavior of both parties in the direction of forging a participatory relationship that serves the interests of both. Hence the importance that participatory banks can play in terms of contributing to solving this financing problem.

2- It is mandatory for participatory banks to give priority to the participatory approach in their financing transactions when they are adopted in Morocco. To overcome the negatives of previous reforms, and to establish new credit conditions, through which attention shifts from lending management to investment management, and from focusing on guarantees - of various types - to focusing on the search for economic feasibility, and from granting credit to obtain interest to stimulating saving and investment.

3- Adopting the participatory approach by Islamic banks remains subject to removing a set of obstacles that will undoubtedly affect the scope of supposed legitimate competition between them and commercial banks through reconsidering monetary policy.

We can take here - for example - the discount rate mechanism or interest rate that the central bank adopts in the process of providing banks with liquidity, in which Islamic banks will find themselves not benefiting from this mechanism.

Because this lending is based on interest, it will thus be forced to maintain a high liquidity coefficient, which will naturally affect its investment capacity, which requires addressing this legal problem, by seeking to develop a method that is compatible with Islamic banking work, so that the central bank also becomes a refuge safe for these banks.

4 - A group of studies that concerned financial systems have shown that the difficulties of accessing credit are, in large part, related to the lack of honest and up-to-date information about the financial position of debtors, and about the level of their debt, which prompts banks to be more cautious and to restrict credit[10], which is a problem they suffer from. From Islamic bank financing in general. Improving financial information about Moroccan enterprises is considered one of the important and essential measures in order to establish an appropriate environment for financing SMEs, and we appreciate - here - the efforts of the Bank of Morocco regarding the establishment of an observatory on SMEs, in partnership with the National Agency for the promotion of SMEs, which aims To develop indicators of a qualitative nature, relating to the conditions for these companies to access bank financing, as well as follow-up mechanisms; Which leads to the development of a comprehensive and shared vision at the national level on the problem of financing these companies.

Recommendations

1- There must be continuous and effective development of government programs such as: Musanada, Imtiaz, and Moukawalati. Considering that it has not currently achieved what is required of it, as evidenced by the fact that a large number of young contractors are being prosecuted before the courts and are threatened with imprisonment.

2- The necessity of seriously activating the plans, recommendations and seminars that were held in this regard, which have not yet found their way to actual implementation due to the absence of a real government policy to qualify SMEs, and enhance their ability to withstand and optimal continuity in the market.

3- It is necessary to emphasize the necessity of finding channels of communication between SMEs with sufficient diversity of offers presented in the national financial market, bringing contractors closer to the privileges provided to them by financial institutions, and having a clear vision of the projects presented by the enterprises while resorting to institutions. An intermediary responsible for completing financial transactions between the two sides.

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[10] Royal Decree No. 1-14-193, issued on Rabi' al-Awwal 1, 1436 (2014), implementing Law No. 12-103, relating to credit institutions, published in Official Bulletin No. 6328 (January 22, 2015).

4 - A clear plan must be developed to finance SMEs, and a "strategy" related to issues must be developed and the concerns of small enterprises, and identifying and controlling reasonable solutions capable of strengthening the path of this category of enterprises in an accurate and clear manner without confusion or problems.

References[11]

Alaa Mustafa Abdel Maqsoud, Abu Ajila. (2017). Islamic finance and its role in financing small enterprises, *Dar Al-Fikr Al-Jami'i*, Alexandria, Egypt.

Al-Bakri, A., & Al-Safi, W. (2010). Money and banks between theory and practice, first edition, *Dar Al-Mustaqbal*, Amman, Jordan.

Al-Daas, A., & Al-Jaarat K.J. (2014). The role of Islamic banks in financing small and medium enterprises in Jordan, *Zarqa Journal of Humanitarian Research and Studies, 69(2)*, 195-179.

Al-Kashbour, M. (2002). The Concept of Stopping Payment, *Journal of Al-Muntada, (47)*, 39-66.

Al Khamlichi, A. (2010). Usury between the texts and their interpretation and what the theory and practice have led to, *Dar Al-Kalima for Publishing and Distribution,* Egypt.

El Khir, R. (2010). The banking system in Morocco, and the problem of financing small and medium enterprises, Hassan II University, *Faculty of Economic and Social Legal Sciences*, Ain Chock, Morocco.

Al-Sharqawi, A. (2000). Islamic banks: the experience between jurisprudence, law and application, *Arab Cultural Center*, Casablanca. Morocco.

Al-Shawarbi, A., & Al-Shawarbi, M. (2007). Managing the risks of banking default from the banking and legal points of view: A banking reform system between theory and practice through a philosophical, methodological, and enlightening vision, *Al-Maktab Modern University*, Alexandria, Egypt.

Balaji, A. (2016). Islamic Participatory Banks in Morocco, *Top Press*, Rabat, Morocco.

Bank Al-Maghrib, BAM. (2022). Annual Report on the control of the activity and results of credit institutions.

Belletante, B. & others (2001). Economic diversity and financing methods for SMEs, preface by Jean Claude TRICHET, L'Harmattan, Paris, France.

Ben Hafou, H.A. (2015). Murabaha in Participatory Banks, *Al-Manbar Legal Journal*, *(9)*, 17-33.

Boulharir, L. (2017). The challenges of crowdfunding in the face of the financial constraints of SMEs, what contribution and what reality? A survey of Moroccan businesses, *Research and Applications in Islamic Finance*, *1(1)*, 40-58.

Heni, M. (2003). A dictionary of economic and financial terms (Arabic-English), with a glossary of key English terms, foreword by Khalil Hosni Sayegh, *Library of Lebanon*, Beirut.

Jouahri, A. (2022). Bank Al-Maghrib and the investment situation, Committee on Finance and Economic, *Development House of Representatives*, 1-54.

Malhaoui, Y. (2017). The Concept of Stopping Payment from a Judicial Perspective, Al-Qasr Journal, *A Quarterly Journal of Legal Studies and Documents, (17),* 98-104.

Masmoudi, H. (2006). Loan granting strategy and analysis of entrepreneur failure, application of models on business data, *Hassan II University, FSJES*, Casablanca, Morocco.

Mourid, J. (2012). Islamic banks in light of regulatory developments for financial products in Morocco, *Al-Muttaqi Printer*, Mohammedia, Morocco,

Murad, A. (2000). Encyclopedia of Banks, Alexandria, Egypt.

Salhi, S. (2013). Financial Efficiency of Investment Formulas and Islamic Financing Methods, *Research Files in Economics and Management, (1),* 17-50.

Wardi, S.M. (2011). Fundamentals of Islamic Economics and its Contemporary Applications, *Top Press*, Rabat, first edition, Morocco.

Wardi, S.M. (2014). Participatory financing in Islamic banks between the desired development goal and the reality of the witnessed challenges, publications of the Moroccan Association for Islamic Economics, *Top Press*, Rabat, first edition. Morocco.

World Bank, (2022). Ministry of Commerce and Industry in Morocco. Investment Climate Assessment.

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[11] In the bibliographical references listed below, there are French-language articles and books that have been translated into English.

Morocco's trade facilitation performance: A Benchmarking Analysis

Anas CHEKROUNI

PHD Dr. In Economics and Management

Laboratoire d'Etude et de recherches Economiques et Sociales (LERES) - Faculty of Law, Economics and Social Sciences - Moulay Ismail University, Meknès, Morocco

a.chekrouni@edu.umi.ac.ma

Mohamed Mouad DIDI SEDDIK

PHD Dr. In Economics and Management

Laboratoire d'Etude et de recherches Economiques et Sociales (LERES) - Faculty of Law, Economics and Social Sciences - Moulay Ismail University, Meknès, Morocco

mouad.didi@gmail.com

Mohammed BENCHEKARA

Professor of higher education

Laboratoire d'Etude et de recherches Economiques et Sociales (LERES) - Faculty of Law, Economics and Social Sciences - Moulay Ismail University, Meknès, Morocco

benchekara@hotmail.com

Abstract

Trade facilitation has attracted considerable interest as a central concept in international trade, especially for developing countries. This paper examines trade facilitation reforms in Morocco, focusing on its performance relative to similar economies in the MENA region, Sub-Saharan Africa, and the Lower-Middle-Income group. Using a comparative benchmarking approach spanning from 2010 to 2023, the study analyzes five composite indicators that measure both policy contributions and outcome: the World Bank's Trading Across Borders (TAB) and Logistics Performance Index (LPI), the World Economic Forum's Enabling Trade Index (ETI), the OECD's Trade Facilitation Indicators (TFIs), and the UN's Global Survey on Trade Facilitation and Paperless Trade Implementation (GSTF-PTI). The findings reveal contrasting trends. While Morocco demonstrates strong regional outcomes in reducing trade times and costs, as evidenced by the TAB indicators, its performance on the LPI and ETI is less positive. In terms of policy contributions, Morocco exhibits a positive trend compared to the benchmark groups, showing progress in several areas, but also highlighting delays and opportunities for improvement. A detailed analysis of sub-indicators within the OECD's TFIs and the GSTF-PTI reveals that Morocco excels in transparency, formalities, advance rulings, governance and impartiality, and fees and charges, but lags behind in indicators related to cooperation and institutional arrangements. These findings underscore the need to prioritize trade facilitation reforms in Morocco while acknowledging the challenge of sustaining momentum. Future research should extend the analysis to similar countries, validating the indicators' relevance and exploring the construction of a trade facilitation index system tailored to the Moroccan territory.

Keywords— Trade Facilitation, WTO Trade Facilitation Agreement, Benchmarking, Trade Facilitation Indicators, Monitoring and Evaluation, Morocco, MENA, Sub-Saharan Africa

I. INTRODUCTION

Since the 1996 Singapore Ministerial Conference, trade facilitation has attracted considerable interest as a central concept in international trade. Today, it is mentioned in most modern trade agreements, and the study of its beneficial effects has gained increasing interest. Recently, it has become a focal point of numerous trade initiatives globally. Indeed, this growing importance has been further catalyzed by the 2017 entry into force of the World Trade Organization's (WTO) Trade Facilitation Agreement (TFA) and the increasing need for its implementation.

The positive economic impact of trade facilitation in reducing trade costs is well documented (Arvis et al., 2013; Hoekman & Nicita, 2011; Moïsé & Sorescu, 2013; OECD, 2018), as is its positive effect on key export performance indicators. Implementing trade facilitation reforms enhances export growth (Arvis et al., 2018; Portugal-Perez & Wilson, 2012; Zaki, 2014), export diversification (Bourdet & Persson, 2014; Dennis & Shepherd, 2011; Lee & Kim, 2012), and the probability and propensity of firms to export internationally (Hoekman & Shepherd, 2015; Seck, 2017; Shepherd, 2013). We also know that engaging in international agreement like TFA has a positive impact on international trade, welfare, international and regional integration (Beverelli et al., 2023; Hillberry & Zhang, 2015, 2018; Valensisi et al., 2016).

Recognizing the numerous advantages offered by the TFA's full implementation, several developing countries, including Morocco, have ratified its provisions. The Kingdom ratified the TFA in 2019 and notified 91.2% of Category A measures, positioning it among the countries with the highest implementation rate in the MENA region and Sub-Saharan Africa. This decision has directly impacted Morocco's export performance, notably by improving its intensive export margin by 6.3%, as evidenced in a recent study (CHEKROUNI & BENCHEKARA, 2024).

However, a review of the existing literature on trade facilitation reveals a near-complete absence of studies focusing on impact assessment using performance and benchmark indicators compared to those relying on econometric methods. This article aims to address this gap by emphasizing the analysis of Morocco's performance and regional standing in trade facilitation, using a carefully selected set of indicators.

Considering the complexity of the trade facilitation concept, this study considers both broad and narrow indicators, as well as those measuring policy contributions and outcomes. Given the numerous existing indicators, this analysis focuses on those frequently used in the economic literature to assess the economic impact of trade facilitation reforms. These include the Doing Business Trading Across Borders (TAB) indicators and the Logistics Performance Index (LPI) from the World Bank Group, the Enabling Trade Index (ETI) from the World Economic Forum (WEF), the Trade Facilitation Indicators (TFIs) from the OECD, and the indicators from the UN Global Survey on Trade Facilitation and Paperless Trade Implementation (GSTF-PTI).

Based on data availability and spatiotemporal coverage, the benchmark employed in this study relies on two primary criteria. The first is geographical, comparing Morocco to the Middle East and North Africa (MENA) region and Sub-Saharan African countries. The second relates to income level, positioning Morocco within the lower-middle-income bracket according to the World Bank classification.

This study complements our previous work (CHEKROUNI & Mohamed, 2023), which attempted to measure Morocco's performance using similar indicators, and that of (Chauhan & Vijayakumar, 2021) conducted in India. However, it stands out as one of the first, and possibly the first to our knowledge, that attempts to measure trade facilitation by positioning the country (Morocco) within its regional and international context. Additionally, it utilizes more up-to-date data, providing a more recent analysis of the subject. Furthermore, the evaluation process compares the composite indicators used and tries to identify those that best reflect the commitments made. This ultimately leads to recommendations aimed at optimizing the effectiveness of Morocco's reform implementation.

The remainder of this paper is structured as follows: Section 1 reviews the relevant literature. Section 2 explains the methodology and presents the data used. Section 3 presents our main results and discussions. Finally, the last section summarizes the key conclusions and policy implications.

II. LITERATURE REVIEW

1. Defining trade facilitation

It may come as a surprise that there is no standard definition of trade facilitation. While the international community acknowledges the need for reform to further enhance trade flows, there is no universally agreed upon or formal definition of the concept.

Given the diverse interpretations of trade facilitation, numerous definitions have been proposed by academic literature and international organizations. However,

conceptual analysis reveals the development of their own understanding of what trade facilitation should encompass. The approaches used are far from uniform (Nguyen et al., 2016; Wilson et al., 2002). Consequently, the way the concept is defined depends on the scope of the agreement or study. For instance, the (WTO, 2015) encompassed eleven different definitions of the concept, while (Grainger 2008) listed eighteen general concepts of the term.

However, it is possible to classify how the term has been used in the relevant literature according to two spectrums or fields of application: broad and narrow. Under the broad spectrum, researchers have focused on the concept as a process of optimizing trade costs by implementing simplified and uniform procedures for international trade (Moïse et al., 2011; Moïse & Sorescu, 2013). Trade facilitation measures can be considered as processes and policies that can reduce the time, cost, and uncertainty of international transactions (Nguyen et al., 2016). They can encompass procedures at the border, up to the border, and even extend beyond the border.

Similarly, the OECD's definition includes international trade procedures, the flow of information related to them, including documents and data, as well as payments throughout the supply chain. Trade facilitation refers the "simplification of trade procedures, understood as *the activities, practices and formalities involved in collecting, presenting, communicating and processing data required for the movement of goods in international trade.*" (Moïsé et al., 2011, p. 7). This definition also includes measures taken behind the borders, for example, e-commerce, product standards, conformity assessment measures, and logistics services. From this perspective, it includes cross-border processes and other processes involved in international trade.

In the narrow sense, trade facilitation focuses on streamlining border procedures. It is centered on operational aspects of international trade and particularly concentrates on border-related issues such as customs efficiency, documentary and procedural requirements, and the logistics of moving goods across borders. Belonging to this operational aspect of international trade, the WCO defines trade facilitation as "*The simplification and harmonization of international trade procedures, including activities, practices, and formalities involved in collecting, presenting, communicating, and processing data required for the movement of goods in international trade.*" (WCO, 2018, p. 38).

The practical definition of trade facilitation is also consistent with that of the WTO and essentially refers to reform measures limited to the logistics of customs clearance of goods in ports or to more efficient documentation of cross-border trade-related traffic. This definition primarily covers customs regulations and corresponds to the costs of commercial transactions at the border. The concept of trade facilitation under the auspices of the WTO therefore refers to measures "*to expedite the movement, release and clearance of goods, including goods in transit.*" (WTO, 2015, p. 35).

In summary, trade facilitation continues to attract growing interest. For years, it has been at the heart of the concerns of international organizations and academia alike. Although the definition of trade facilitation varies considerably, its fundamental pillars converge towards the same objective.

2. *Trade Facilitation Indicators*

As well as the heterogeneity of explanations surrounding the concept of trade facilitation, methods for evaluating the implementation of related reforms or their impacts continue to generate developments and discussions, subject to controversies and debates. Numerous evaluation methods have been employed, and many composite indicators and indices have been constructed by international organizations or specialized academic literature. Various measures and indicators are available to assess and measure the effectiveness of trade facilitation efforts, highlighting the importance of ongoing monitoring and evaluation in this area. For instance, (Orliac, 2012) highlights the existence of more than 12 indicators relating to trade facilitation, while the (WTO, 2015) mentions more than 33. These measurement indicators differ in their scope, coverage, evaluation methods, and calculation methods. Consequently, despite their frequent overlaps, their exhaustive categorization proves challenging.

However, the current literature on measuring the level of trade facilitation is evolving primarily in two directions. The first concerns the selection of indicators, while the second focuses on weighting through a relatively comprehensive evaluation system.

Regarding the selection of indicators, there are particularly two categories. While the first draws directly from indices issued by international organizations (Jean-François et al., 2018; Moïse & Sorescu, 2013; United Nations, 2023; WEF, 2016; World Bank, 2020), the second focuses on constructing an index system, based on the pioneering work of (Wilson et al., 2003).

The first category, in turn, can be subdivided into two subgroups. One group of indices adopts a broader definition of trade facilitation, such as the World Bank's Logistics Performance Index (LPI) (Jean-François et al., 2018), the World Bank Group's Doing Business (DB) index and its Trading Across Borders (TAB) indicators (World Bank, 2020), or the World Economic Forum's (WEF) Enabling Trade Index (ETI) (WEF, 2016). A second group relies on a narrow conception, all focused on implementing specific measures geared towards efficient management of border processes. Among them are mainly the OECD's Trade Facilitation Indicators (TFIs) (Moïse et al., 2011; Moïse & Sorescu, 2013) and the UN Global Survey on Trade Facilitation and Paperless Trade Implementation (GSTF-PTI) (United Nations, 2023).

Based on the research framework of (Wilson et al., 2003, 2005), a second approach evaluates trade facilitation by constructing an index system. The pioneering work of these authors considers four categories of indicators: customs environment, regulatory environment, port efficiency, and electronic-business usage or service sector infrastructure. Unlike the first category, the literature related to this approach (Portugal-Perez & Wilson, 2012; Sakyi et al., 2017; Shepherd & Wilson, 2009; Töngür et al., 2020; Yadav, 2014; Yushi & Borojo, 2019; J. Zhang & Wu, 2018) attempts to build a more complex measurement system encompassing a wide range of indicators and indices compiled from various sources (WEF's Global Competitiveness Report, World Bank's Doing Business, World Bank's Global Logistics Indicators Survey, World Development Indicators, OECD's Trade Facilitation Indicators, Transparency International, etc.).

Fig. 1: Comparaison of Trade Facilitation Indices

OECD's Trade Facilitations Indicators	United Nations Global Survey on Trade Facilitation and Paperless Trade	WEF's Enabling Trade Index	World Bank's Logistic Performance	World Bank's Trading Across Borders
Information availability	Transparency	Domestic market access	Customs	Time to export in hours (Documentary and border compliance)
Involvement of the trade community	Formalities	Foreign market access	Infrastructure	
Advance Rulings	Institutional Arrangement and Cooperation	Efficiency and transparency of border administration	International shipments	Cost to export in US$ (Documentary and border compliance)
Appeal Procedures		Availability and quality of transport infrastructure	Logistics competence	
Fees and Charges	Paperless trade	Availability and quality of transport services	Tracking and tracing	Time to import in hours (Documentary and border compliance)
Formalities	Cross- border Paperless trade	Availability and use of ICTs	Timeliness	Cost to import in US$ (Documentary and border compliance)
Cooperation				
Governance and Impartiality		Operating environment		

Source: *Authors*

For example, (Shepherd & Wilson, 2009) consider three dimensions in the trade facilitation index system: efficiency of maritime and air ports, the extent of irregular payments in relation to export/import licenses, and the level of competition among Internet Service Providers (a proxy for regulation of backbone services sectors). (Portugal-Perez & Wilson, 2012)

construct an index system that focuses on factors related to the "hard" or "soft" dimension of trade facilitation. They include four main indices (Information and communications technology, Physical infrastructure, Business environment, and Border and transport efficiency) calculated from 18 primary variables. Considering 35 African countries, (Sakyi et al., 2017) measure trade facilitation by focusing on the 'border and transport efficiency' channel, which captures the time, real costs, and regulatory burdens connected to the ease of trading across a country's border, as well as the level of transparency and efficiency of customs formalities and procedures. In another study covering 44 African countries, (Yushi & Borojo, 2019) construct a broader index system for the quality of economic institutions, border and transport efficiency, and physical and communication infrastructure.

Another growing body of literature attempts to assess the level of trade facilitation at the regional and provincial levels (Chaoyu, 2023; Cui et al., 2019; Huang, 2023; Zou, 2022). Researchers in this trend contribute to expanding the use of index systems at the territorial level, taking into account the specificities involved. For example, (Chaoyu, 2023) measures the level of trade facilitation in Zhejiang Province (China) by constructing an index system including five primary indicators: transportation, customs, regulation, finance, and information and technology. Similarly, based on the provincial perspective, (Zou, 2022) constructs and calculates China's provincial trade facilitation index based on four dimensions: marketability index, facilitation infrastructure, service capability, and development potential.

The allocation of weight in measurement systems is another point of heterogeneity that characterizes the construction of trade facilitation indices. According to the related literature, three main methods can be mentioned (Zou, 2022): principal component analysis, which extracts the main components through factor analysis (Portugal-Perez & Wilson, 2012; Sakyi et al., 2017; Yushi & Borojo, 2019), the arithmetic mean method assigning equal weight to all indicators (Shepherd & Wilson, 2009), and the hierarchical analysis method, which assigns values to different indicators to account for their heterogeneity (Chaoyu, 2023; J. Zhang & Wu, 2018).

III. Data sources and methodology

Different tools, methods, and approaches have been proposed to measure, monitor and evaluate projects, programs, and polices (Bamberger et al., 2004; Desplatz & Marc, 2016; Glewwe & Todd, 2022; Grun, 2006; Hunter, 2009; Khandker et al., 2009; Tengan et al., 2021).

One of the most well-known tools for monitoring and assessing trade facilitation reforms is performance indicators (Chauhan & Vijayakumar, 2021; CHEKROUNI & Mohamed, 2023), defined as "*measures of inputs, processes, outputs, outcomes, and impacts for development projects, programs, and strategies. When supported with sound data collection, indicators enable managers to track progress, demonstrate results, and take corrective action to improve service delivery*" (Bamberger et al., 2004, p. 6).

To achieve this objective, as outlined by (Glewwe & Todd, 2022), effective selection of performance indicators requires adherence to SMART criteria, which emphasizes Specificity, Measurability, Achievability, Relevance, and Time-boundedness. In our case, this method is appropriate for our research objective as it presents several advantages. First, it is an effective way to measure the achievement of set goals compared to the progress actually made. Second, it facilitates comparison across countries according to different areas of intervention and over time.

Given that our objective is to compare Morocco's performance with other similar countries, we opt for databases benchmarking countries' trade facilitation reforms, particularly the indices issued by international organizations. Considering the extensive number of indicators, our attention will be directed towards those most commonly employed in economic literature to assess the economic impact of trade facilitation reforms.

These include the Logistics Performance Index (LPI) from the World Bank (Jean-François et al., 2018), the Doing Business Trading Across Borders (TAB) indicators from the World Bank Group (World Bank, 2020), the Enabling Trade Index (ETI) from the World Economic Forum (WEF, 2016), the Trade Facilitation Indicators (TFIs) from the OECD (Moïse et al., 2011; Moïse & Sorescu, 2013), and the UN Global Survey on Trade Facilitation and Paperless Trade Implementation (GSTF-PTI) (United Nations, 2023).

However, it's important to note that these indicators have different primary goals. The examination of trade facilitation indicators and indices offers the possibility of classifying them according to their nature and scope, dividing them into four distinct segments (WEF, 2016). This classification is materialized by a cartographic representation used to position the various data collection approaches according to their degree of precision (whether primary data or transactional data, or subjective data based on perception and opinion), and their specific objective (whether political, environmental, outcome-related, or performance-related).

Similarly, it is crucial to distinguish between indicators that measure contributions to policies, such as the OECD's TFA or the GSTF-PTI, those that measure policy outcomes, such as the World Bank's TAB, and those that combine both approaches, like the LPI and the ETI (Peterson, 2017; WTO, 2015). Additionally, as discussed above, there is another important classification that focuses on how trade facilitation is conceptualized. The World Bank's LPI and TAB, as well as the WEF's ETI, take a broader view of trade facilitation. On the other hand, the TFA and GSTF-PTI have a more limited perspective, both centered on cross-border movement.

Despite these notable differences, these indicators can complement each other as they ultimately share the same purpose: reducing trade costs and boosting international trade. Therefore, as we take a comprehensive look at trade facilitation reforms, we will examine both the broad and narrow views of trade facilitation. We will consider both indicators that measure policy outcomes and those that measure contributions to policies. In order to facilitate the understanding of the utilities, complementarities and dissimilarities relating to these composite indicators, we summarize, in the table below, their main parameters and characteristics.

Table. 1 : Trade Facilitation Indicators for Benchmarking Analysis

Indicators	Agency	Frequency/ Coverage	Data Period	Score, Rank, or Both	Aggregation level	Scope and objectives
TFIs	OECD	Biennial 164 countries	2017 2019 2021	Score	National	Benchmarks the progress of countries in achieving customs reform under the TFA and monitors implementation TFA provisions concerning: Information availability, Involvement of the trade community, Advance Rulings, Appeal Procedures, Fees and Charges, Formalities, Cooperation and Governance and Impartiality.
TAB	World Bank	Annual 190 countries	2010 2020	Score and rank	National	Captures the average time and cost (excluding customs duties) incurred during the export and import logistics process, across three key areas: border compliance, documentary compliance, and domestic transport.
LPI	World Bank	Biennial 160 countries	2010 2018	Score and rank	National	Measures and rank countries trade environment using logistics performance based on six dimensions: customs, infrastructure, ease of arranging shipments, quality of logistics services, tracking and tracing, and timeliness.
ETI	WEF	Annual 136 countries	2010 2016	Score and rank	National	Encompassing a broader set of indicators than the World Bank's LPI, the ETI measures and ranks countries' trade facilitation capabilities across seven key pillars: domestic market access, foreign market access, efficiency and transparency of border administration, availability and quality of transport infrastructure, availability and quality of transport services, availability and use of ICTs and operating environment.
GSTF-PTI	United Nations	Biennial 143 countries	2019 2021 2023	Score and rank	National	comprises forty-seven questions designed to assess and benchmark five key areas related to trade facilitation and the adoption of paperless trade: Transparency, Formalities, Institutional Arrangement and Cooperation, paperless trade and cross-border paperless trade.

Source: *Authors*

With regard to spatiotemporal coverage, the analysis periods or comparison countries differ considerably from one indicator to another. Based on data availability, we selected the latest available years. The overall analysis period spans from 2010 to 2023, depending on whether the data is collected annually or biennially

To ensure consistent comparisons, we considered two main criteria when selecting benchmarks: geography and income level. The first compares Morocco to the MENA region and Sub-Saharan African countries. The Second compares Morocco's economic status, placing it in the lower-middle-income bracket according to the World Bank classification.

IV. RESULTS AND DISCUSSION

We examine Morocco's performance as measured by five international composite indicators, produced by different agencies with varying periodicity. The five selected indicators pertain to the national level of aggregation.

1. Morocco's Performance Measured by Broad Trade Facilitation Indicators

In this first block of analysis, we focus on the broad trade facilitation indicators, namely the TAB, LPI, and ETI. A subsequent section will address the narrow trade facilitation indicators.

1.1. The World Bank Trading Across Borders Indicators

Given the broad data coverage, this first analysis will cover the period from 2010 to 2020, reflecting on a decade. For benchmarking purposes, we compare Morocco's situation with Africa and the MENA region by selecting seven African countries and seven MENA countries. The choice is justified by the fact that the overall DB ranking of these countries in the 2010 DB edition exceeded that of Morocco[1].

Over this analysis period, Morocco recorded a notable improvement in 2020 compared to 2018, rising from 65th to 58th place globally, representing an improvement of 7 places. In terms of the TAB score, Moroccan performance improved by 3.2 points, from 82.4 in 2019 to 85.6 in 2020, representing the fastest pace during the period. Over the past ten years, Morocco has progressed by 14 places to occupy the 58th global rank.

However, it is worth noting that since the 2016 edition of the DB, when a substantial modification was made to the methodology, Morocco's ranking was negatively impacted, with an exceptional and abnormal drop of more than 70 places (from 31st in 2015 to 102nd in 2016). Compared to the positive trend of the 2011-2015 period, significant simplification and dematerialization reforms and data corrections were deployed by the various administrations involved in the import and export process. These efforts contributed to restoring Morocco's ranking, which recorded a

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[1] For African countries, these are Mauritius, South Africa, Botswana, Namibia, Rwanda, Zambia, and Ghana. Countries in the MENA region include Bahrain, Qatar, Kuwait, Oman, Saudi Arabia, Tunisia and the United Arab Emirates.

significant jump of 44 places between the 2016 and 2020 editions to reach 58th place, compared to 102nd place.

Regionally, according to the latest report edition, Morocco occupies the 4th place in Africa, behind Eswatini, Lesotho, and Botswana, and the 3rd place in the MENA region behind the Republic of Malta and the West Bank and Gaza. In North Africa, Morocco maintains its leadership ahead of Tunisia (90th rank), Egypt (171st), and Algeria (172nd).

Fig. 2: TAB rank in Africa and the MENA Region
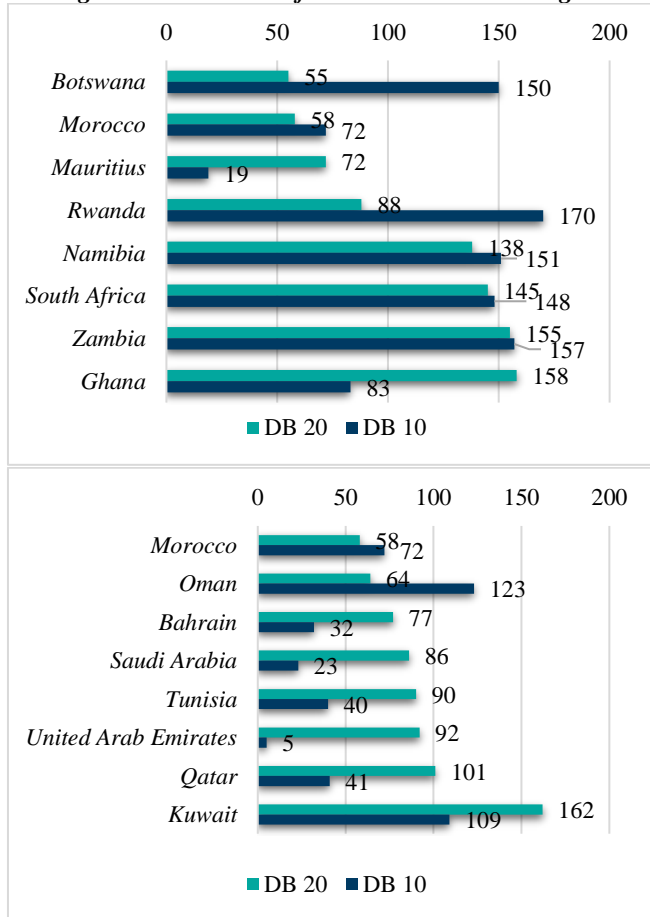
Source: *Authors*

Among the MENA countries, Morocco outperforms all other comparison countries, including the United Arab Emirates (92nd), which leads the MENA region according to the Doing Business index (16th). With the exception of Morocco and Oman, which improved their ranking compared to 2010, the other countries in the region saw their ranking decline during the period under review. Regarding African comparison countries, Morocco maintained a good regional position by ranking 58th, behind Botswana (55th), despite methodological changes made to the TAB indicators in the 2012 and 2016 editions.

1.2. The World Bank's Logistics Performance Index

The latest available LPI edition for Morocco (2018) encompassed data from 160 countries, with surveys administered to 869 logistics professionals across 108 nations. Analyzing the 2010-2018 period reveals a concerning trend: unlike the TAB analysis, the LPI reflects a decline in the nation's trade facilitation performance. In the 2018 index, it

ranked 109th out of 160 countries with a score of 2.54, representing a drop of 23 places and 0.33 points compared to its 2016 ranking (86th with a score of 2.67).

Within the MENA region, Morocco ranks 11th among Arab countries, trailing behind the United Arab Emirates (11th globally), Qatar (30th), Oman (43rd), Saudi Arabia (55th), Bahrain (59th), Kuwait (63rd), Egypt (67th), Lebanon (79th), Jordan (84th), and Tunisia (105th). Continentally, it holds the 18th position in Africa, lagging behind South Africa (33rd), Côte d'Ivoire (50th), and Rwanda (57th). This performance falls short of regional averages across the board. As shown in Figure 3, Morocco exhibits a lower performance than the MENA region, Sub-Saharan Africa, and lower-middle-income countries (LMICs) in all six LPI sub-indicators (customs, timeliness, tracking & tracing, infrastructure, logistics performance, and international shipments) and the overall LPI score (2.54). This translates to a significant gap compared to the regional averages (2.85 for both MENA and Sub-Saharan Africa, and 2.87 for LMICs).

Fig. 3: Morocco's LPI (Regional and Income-Based Comparisons)
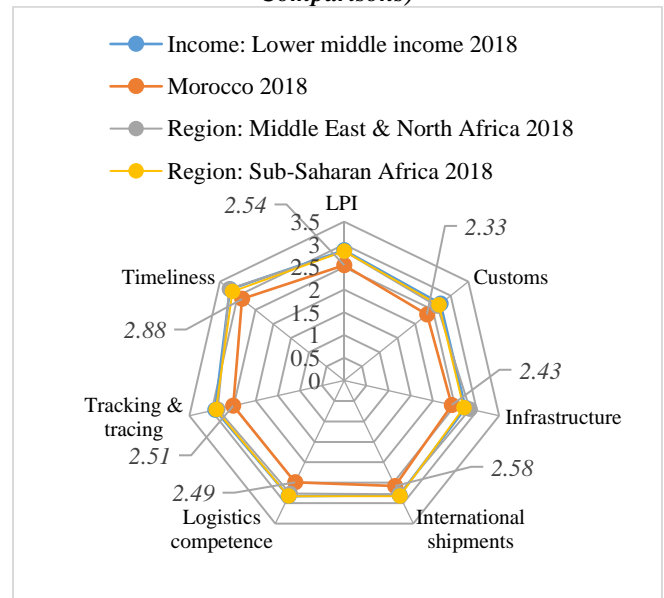
Source: *Authors*

In this regard, the World Bank's 2018 report usefully aggregates international LPI results from four editions (2012, 2014, 2016, and 2018) in Annex 1. This aggregation minimizes random variations between surveys and facilitates comparisons across 167 countries. With an average score of 2.67, Morocco placed 87th out of 167 countries. Despite a decline in 2018, Morocco held the second position among North African countries, following Egypt (60th), and ahead of Tunisia (104th), Algeria (107th), Sudan (130th), and Libya (155th).

However, analyzing trade facilitation in Morocco based on this index should be done cautiously, despite the seemingly negative trend. First, the LPI does not reflect the scope of the TFA, in which trade facilitation is viewed from a narrow, not a broad, perspective. Indeed, the sub-component relating to customs clearance and border crossing efficiency, which is closely linked to the TFA framework, recorded an

improvement in 2018 compared to 2016 (2.33 compared to 2.22 previously), unlike the other components of the index.

Furthermore, despite being one of the most widely used data sources for identifying ways to simplify international trade, the LPI has several notable shortcomings (Arvis et al., 2018; ESCAP & OECD, 2017). The experience of international freight forwarders may not reflect the broader logistics environment of poor countries, which often rely on traditional and national operators. International and national operators may differ in their interaction with government agencies and the level of services they offer. Consequently, the LPI may reflect transit difficulties for landlocked countries and small island states (Beysenbaev & Dus, 2020). A low score for a landlocked country does not necessarily reflect its efforts to facilitate trade, which depend on the functioning of complex international transit systems.

Moreover, several studies have also noted that the results of the LPI survey raise some doubts about their reliability, with strong jumps in indicators for some countries such as Kazakhstan and Kyrgyzstan (Zhanarys et al., 2017), Ukraine (Kurochkin, 2013) which gained more than 50 places in 2 years, or the absence of rank movement for Russia despite logistical improvements made in that country (Zhanarys et al., 2017).

These doubts are supposedly attributable to the highly subjective nature of the LPI, which is more influenced by social factors than economic factors, due to a systematic cultural bias, as shown by (Guner & Coskun, 2012; Stepanova, 2022). These authors demonstrate a lack of correlation between country performance on the LPI and objective economic indicators. For instance, (Guner & Coskun, 2012) found no correlation with gross investment expenditure in transport infrastructure. Similarly, (Stepanova, 2022) observed no correlation with GDP or the Global Competitiveness Index (GCI), despite the expectation that such economic indicators would be associated with LPI scores.

To address the inherent subjectivity of the LPI, (Beysenbaev & Dus, 2020) developed the Integrated Logistics Performance Index (ILPI).

Table. 2: Comparing ILPI and IPL Scores for Morocco

| Country | L'ILPI | | IPL 2018 | Rank comparison | |
	Score	Rank	Rank		
Mauritania	0.42	121	134	*13*	↑
Mauritius	0.48	88	77	*-11*	↓
Mexico	0.52	64	50	*-14*	↓
Moldova	0.51	73	115	*42*	↑
Mongolia	0.46	98	129	*31*	↑
Montenegro	0.51	74	76	*2*	↑
Morocco	**0.48**	**90**	**108**	*18*	↑
Myanmar	0.39	133	136	*3*	↑
Nepal	0.42	124	113	*-11*	↓
Netherlands	0.81	3	6	*3*	↑
New Zealand	0.67	27	15	*-12*	↓
Niger	0.32	158	156	*-2*	↓

Source: *(Beysenbaev & Dus, 2020, p. 41), annexe A*

This enhanced index builds upon the World Bank's LPI framework but incorporates international statistical data to provide a more objective assessment of logistics systems and subsystems across 159 countries. The ILPI thus offers both a qualitative and quantitative perspective on logistics performance.

In contrast to the declining trend observed in Morocco's LPI score, the ILPI reveals a notable improvement in 2018. Morocco's ranking jumped 18 places, reflecting a significant enhancement in its logistics performance (table 2). This positive trend aligns with the findings of our analysis.

1.3. The World Economic Forum's Enabling Trade Index

Figure 4 depicts Morocco's performance on the ETI index from 2010 to 2016. Over this period, the Kingdom exhibited consistent improvement, ascending 26 positions from 75th to 49th globally (out of 136 nations). This positive trend is further highlighted by a 0.7 point increase in score (from 3.9 to 4.6) on the 7-point ETI scale (where 7 represents optimal performance).

**Fig. 4 : ETI rank in Africa and the MENA Region**
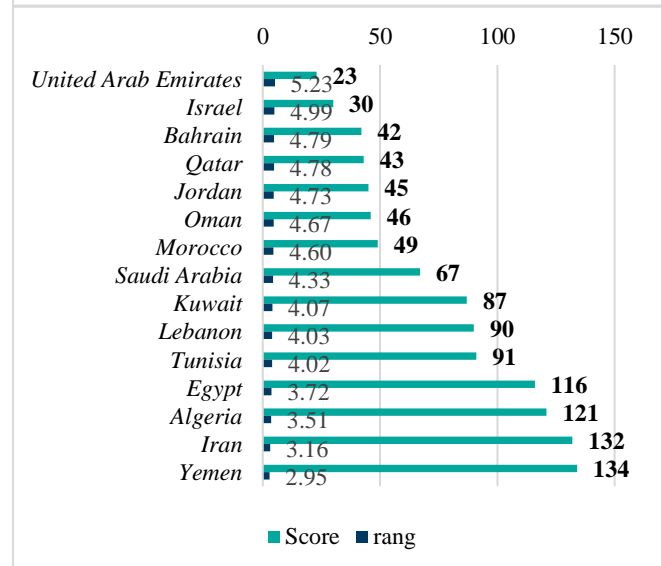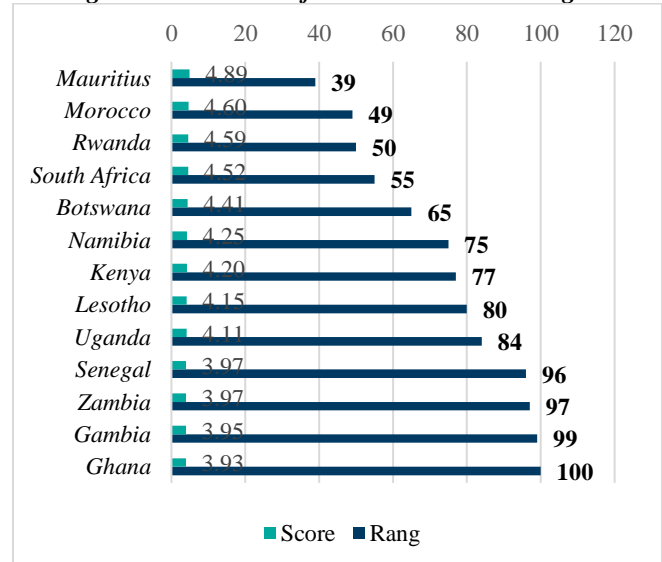
Source: *Authors*

Regionally, the nation occupied the second position in Africa and seventh in the MENA region. Its ETI ranking surpassed that of Algeria (121st), Iran (132nd), Tunisia (91st), and Egypt (116th) within the MENA region. However, several Arab nations, including the United Arab Emirates (23rd), Bahrain (42nd), Qatar (43rd), Jordan (45th), and Oman (46th), outperformed it. On the African continent, while Morocco ranked higher than Rwanda (50th), South Africa (55th), and Botswana (65th), it was surpassed by Mauritius, which occupied the top position in Africa and 39th globally.

To elucidate the factors contributing to Morocco's overall ETI performance, with particular emphasis on trade facilitation within the framework of the TFA, it is crucial to acknowledge the significant role that border administration plays in the index. While not the sole focus of the ETI, border administration is represented by 13 indicators. Notably, Pillar 3 encompasses several indicators that align with concepts addressed by the TFA. The constituent elements of this pillar are aggregated into sub-index B, which evaluates the quality, transparency, and efficiency of a nation's border administration, reflecting a narrow conception of trade facilitation.

By analyzing Morocco's scores for the four sub-indices comprising the ETI, it is evident that sub-index B consistently exhibited the strongest performance throughout the analyzed period. Specifically, Morocco's performance in border administration demonstrated a 0.7 point improvement, rising from 4.2 in 2010 to 4.9 in 2016. As depicted in Figure 5, a pillar-based analysis spanning 2014 to 2016 reveals a similar trend. This period was selected due to a 2014 methodological shift that rendered the 2010 and 2012 data incompatible, particularly at the pillar level. Consequently, Morocco's performance across the seven ETI pillars is compared with the average performance of the MENA region. Once again, Morocco demonstrates superior performance in the pillar related to border administration efficiency and transparency compared to the MENA regional average. Achieving a score of 4.9 in both 2014 and 2016, the kingdom exceeded the MENA regional averages of 4.61 and 4.63, respectively.
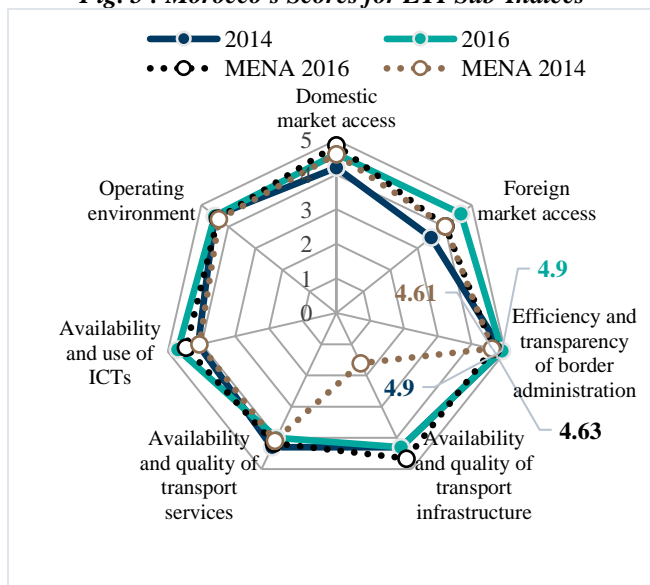
Despite the insights derived from the aforementioned analysis, it is crucial to acknowledge the methodological limitations of using the ETI as a measure of trade facilitation. Similar to World Bank indicators, such as the LPI and TAB, the ETI presents several drawbacks (ESCAP & OECD, 2017). Specifically, the ETI's data timeliness fails to capture Morocco's recent efforts in trade facilitation. Furthermore, the index suffers from comparability issues, as evidenced by the lack of full comparability between the 2016 and 2014 results. An additional concern is that only 36% of the ETI comprises new data added to the WEF report. Significantly, 22 indicators, representing 36% of the ETI, are derived from the WEF's Executive Opinion Survey (EOS), which is inherently subjective.

2. Morocco's Performance Measured by narrow Trade Facilitation Indicators

The methodological limitations of existing trade facilitation evaluation indicators necessitate the mobilization of more targeted and reliable measures within the framework of TFA. Two notable examples are the OECD's Trade Facilitation Indicators (TFIs) and the United Nations Regional Commissions' Global Survey on Trade Facilitation and the Implementation of Paperless Trade (GSTF-PTI).

2.1. The OECD's Trade Facilitation Indicators

Analyzing Morocco's performance across the eleven TFI sub-indicators from 2017-2022, using the most recent available data, reveals an overall improvement in trade facilitation. The average cumulative score increased by 0.18 points, rising from 1.41 in 2017 to 1.59 in 2022. Notably, these scores consistently exceed both the 2022 global average of 1.25 and the 2017 average of 1.06. At the sub-indicator level, Morocco demonstrated improvement in nine areas during this period: information availability, trader involvement, advance rulings, appeal procedures, fees and charges, formalities-documents, formalities-procedures, and internal-external cooperation. Conversely, a slight decline was observed in formalities-automation, while governance and impartiality remained stable.

Fig. 5 : Morocco's Scores for ETI Sub-Indices

Source: *Authors*

Fig. 6: Morocco's TFIs (Regional and Income-Based Comparisons
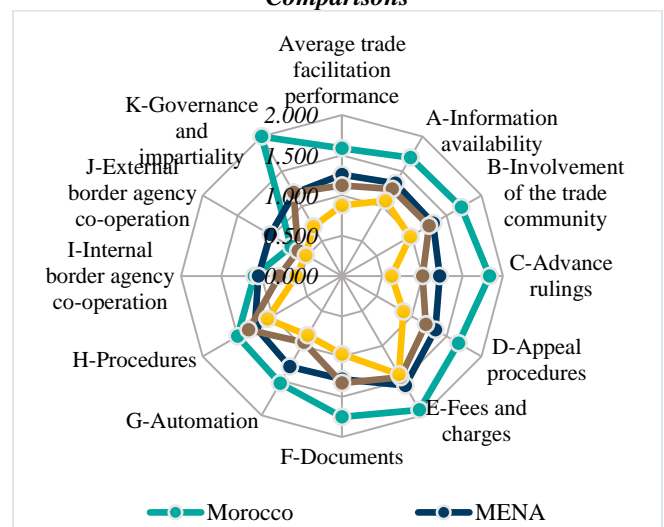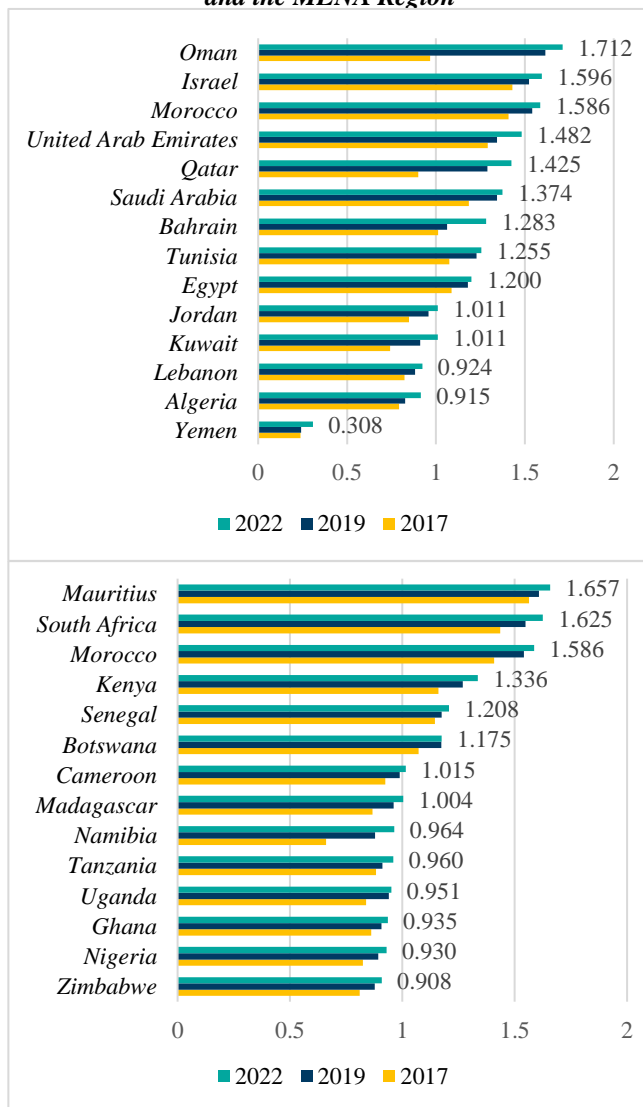

Source: *Authors*

For regional and income-Based comparisons, figure 6 provides a comparative analysis at both the regional level and within the lower-middle-income bracket to which Morocco belongs. Morocco exhibits superior performance in trade facilitation compared to the MENA regional average across numerous areas: information availability, trader involvement, advance rulings, appeal procedures, fees and charges, automation, documentation, procedures, internal cooperation, and governance and impartiality. However, external cooperation with neighboring and third countries emerges as a relative weakness. Furthermore, Morocco surpasses the average performance of both lower-middle-income countries and Sub-Saharan African countries across all eleven TFI sub-indicators.

As shown in Figure 7, based on the overall TFI score, Morocco ranks 3rd in Africa and among MENA countries, placing it among the top performers out of 164 countries.

Fig. 7 : Morocco's Average Trade Facilitation in Africa and the MENA Region

Source: *Authors*

Within the MENA region, the country surpasses all other countries except Oman (average score of 1.712), including its North African neighbors (Tunisia, Egypt, and Algeria).

Similarly, in the African continent, the kingdom outperforms all others in the sample except for Mauritius and South Africa, which achieved scores of 1.657 and 1.625, respectively.

In sum, the comparative analysis reveals a consistent improvement in Morocco's trade facilitation performance across all criteria (temporal, geographical, and income-based). The recorded OECD TFI scores align with anecdotal evidence regarding trade facilitation enhancements, as well as other performance indicators examined in this analysis. Moreover, the robust methodological process employed by the OECD effectively addresses inconsistencies observed in prior assessments of trade facilitation performance. Consequently, the resulting TFI indicator data offers a more accurate and consistent evaluation, reflecting improvements observed across various performance metrics.

However, despite Morocco's positive regional trend, demonstrating its commitment to implementing the TFA provisions, an in-depth analysis of the sub-indicators reveals both achievements and areas for improvement. To further understand these potential delays, the table below compares Morocco's scores across the eleven sub-indicators with the top performers of 2022: Oman for the MENA region, Mauritius for Africa, and Hong Kong, China, for the world. This comparison highlights specific areas where efforts can be focused to enhance trade facilitation further.

Table. 3: Morocco's TFIs vs. Top Performers (MENA, Africa, and World)

Indicator	Morocco	Top performances (MENA, Africa, World)		
		Oman	Mauritius	Hong Kong, China
Average trade facilitation performance	1.586	1.712	1.657	1.879
A-Information availability	1.700	1.670	1.860	2
B-Involvement of the trade community	1.710	1.750	1.500	1.880
C-Advance rulings	1.833	1.571	1.600	2
D-Appeal procedures	1.670	1.640	1.620	1.770
E-Fees and charges	1.920	1.850	1.710	1.860
F-Documents	1.750	1.780	1.780	2
G-Automation	1.540	1.920	1.850	2
H-Procedures	1.500	1.680	1.700	1.800
I-Internal border agency co-operation	1.090	1.550	1.360	1.820
J-External border agency co-operation	0.730	1.550	1.360	1.55
K-Governance and impartiality	2	1.890	1.890	2

Source : *Authors*

As demonstrated in Table 3, analyzing Morocco's relative performance reveals significant disparities between TFIs. While Morocco achieves or approaches optimal performance (score of 2) in areas like advance rulings, governance and impartiality, and fees and charges, even surpassing Oman and Mauritius, other areas exhibit substantial lags (over 0.5 points) compared to top performers. This is particularly evident for indicators related to internal and external cooperation, where effective implementation remains elusive. External cooperation has not even reached an intermediate stage (score of 1). As a result, the weak performance in these areas significantly impacts Morocco's overall score compared to top-performing countries.

The remaining indicators, exhibiting intermediate performance (scores between 1 and 2), signifying partial or ongoing implementation, can be categorized into two groups. The first group, encompassing formalities (documents, procedures, and automation), displays moderate to significant gaps (0.25 to 0.5 points) compared to top performers. The second group, including trader involvement and information availability, demonstrates performance nearing that of top performers (gaps less than 0.25 points). Ultimately, improving Morocco's trade facilitation performance hinges on future efforts in areas where optimal performance remains unrealized. These areas, representing opportunities for progress, primarily encompass internal and external cooperation, and secondarily, formalities (documents, procedures, and automation), trader involvement, and appeal procedures. For areas demonstrating strong performance, the focus should shift to maintaining these achievements.

2.2. The United Nations Regional Commissions' Global Survey on Trade Facilitation and Paperless Trade Implementation

Concluding our analysis with the GSTF-PTI survey, we observe a positive trend in Morocco's trade facilitation between 2019 and 2023. Government initiatives like simplified customs procedures and digitization are reflected in strong performance, particularly in paperless trade (89%) and formalities and transparency (100%). Notably, the GSTF-PTI aligns closely with OECD TFIs in scope and data points. According to OECD TFIs, Morocco's composite score rose from 1.41 in 2017 to 1.59 in 2022. Similarly, the GSTF-PTI shows improvement, from 80.65% in 2019 to 83.87% in 2023.

To accurately measure trade facilitation performance, specifically in relation to the Trade Facilitation Agreement (TFA), we selected 23 out of 58 indicators directly related to the TFA. These indicators can be grouped into five sub-categories: (1) transparency; (2) documentation and procedural formalities; (3) automation; (4) cooperation and institutional arrangements; and (5) cross-border paperless trade.

While Morocco demonstrates strong performance (score of 3) in transparency, formalities, and automation, there's a lag in cooperation and institutional arrangements which are comparable to the "internal and external border agency cooperation" of OECD TFIs. This weakness, mirroring the OECD TFI assessment, should be addressed in future reforms. Improvements are evident in "information availability," "trader involvement," "advance rulings," and "appeal procedures," all aligning with the GSTF-PTI's "transparency"

indicator. Similarly, "formalities (documents, procedures, fees)," "Paperless Trade," and "Cross-Border Paperless Trade" show progress, aligning with GSTF-PTI's "formalities" and "automation" indicators. However, "internal and external border agency cooperation," corresponding to GSTF-PTI's "cooperation and institutional arrangements," show weaker performance.

An analysis of Morocco's average regional position among MENA and Sub-Saharan African countries (Figure 8) confirms this observation. In 2023, the country significantly outperforms regional averages in transparency, documentation and procedural formalities, and automation. However, a notable gap exists in internal border agency cooperation, with Morocco at 33.33% compared to 74.81% for MENA and 66.67% for Sub-Saharan Africa.
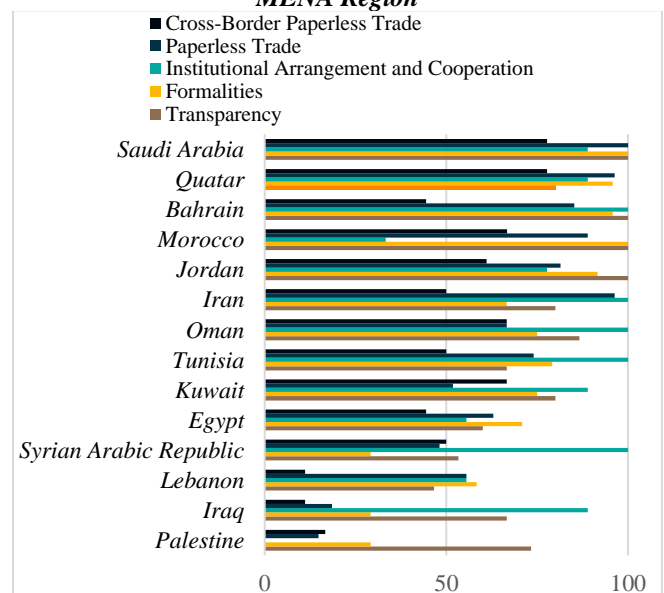
Fig. 8: Benchmarking Morocco's GSTF-PTI (MENA & Sub-Saharan Africa)
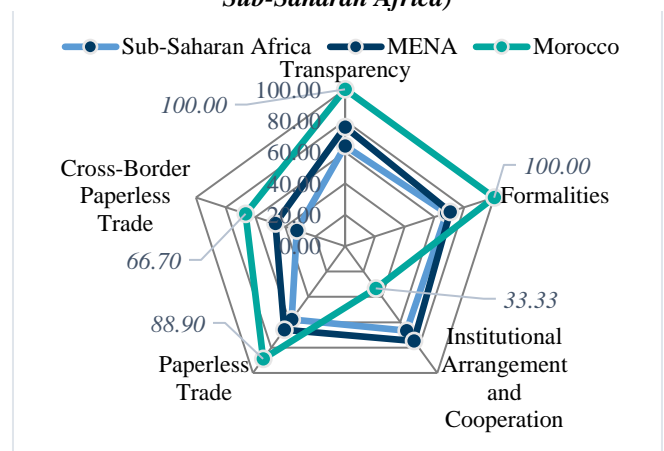
Source: *Authors*

As illustrated in Figure 9, Morocco's strong performance places it third among MENA countries, alongside Bahrain, with an average GSTF-PTI score of 78%. This positions them behind Saudi Arabia (88%) and Qatar (83%).

**Fig. 9: Average Implementation Rates of GSTF-PTI in the MENA Region**

Source: *Authors*

However, despite this relatively advanced standing, Morocco's performance is hampered by weakness in cooperation and institutional arrangements (33.33%), falling short of the regional average (74.81%), unlike its performance in other sub-indicators.

In terms of continental positioning, Morocco secures the fifth position with a score of 78% (Figure 10). This ranking places the nation behind Mauritius (80.65%), Benin (84.65%), Ghana (86.02%), and Rwanda (88.17%), all of which boast higher average GSTF-PTI scores.

Fig. 10: Average Implementation Rates of GSTF-PTI in Sub-Saharan Africa
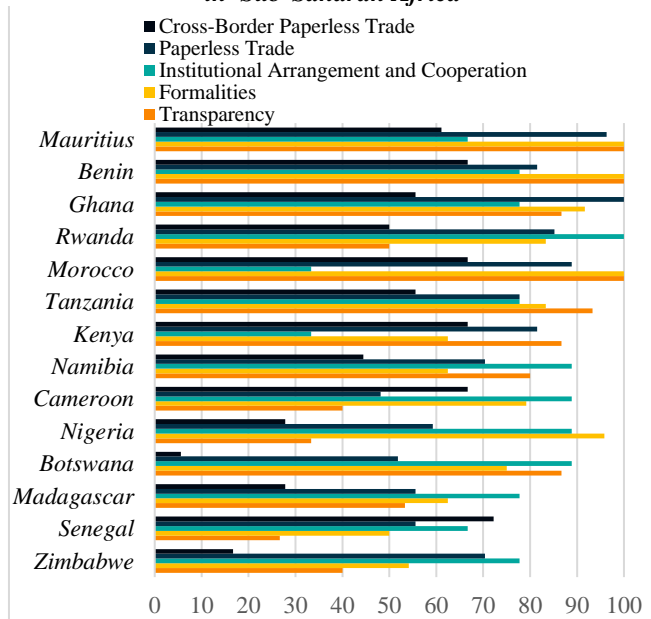
Source: *Authors*

Again, Morocco's ranking is negatively impacted by its low score (33.33%) in cooperation and institutional arrangements. Unlike its performance in other sub-indicators, the kingdom falls short of the regional average (66.67%) in this crucial area.

V. CONCLUSION AND POLICY IMPLICATIONS

This research examined Morocco's international and regional position in trade facilitation, comparing its performance to countries in the MENA region, sub-Saharan Africa, and the Lower-Middle Income group. Utilizing a comprehensive set of composite indicators, the analysis considered both policy contributions and outcomes, differentiating between broad and narrow conceptions of trade facilitation.

The analysis reveals a nuanced picture of Morocco's trade facilitation performance. An assessment of policy outcomes over the past decade suggests a favorable regional positioning for Morocco. Specifically, the TAB indicators underscore notable efforts to reduce trade times and costs, particularly in areas of border and documentary compliance. However, the LPI and ETI offer a more qualified perspective, highlighting shortcomings not fully captured by the TAB indicators. The integration of refined measures, such as the ILPI and sub-indices specific to narrower conceptions of trade facilitation,

provides a more comprehensive and nuanced understanding of the ground realities.

Shifting the focus to indicators measuring policy contributions, the analysis reveals positive trends at the regional level (Africa and MENA). However, a granular examination of sub-indicators related to TFIs and the GSTF-PTI exposes disparities across various domains. Morocco exhibits commendable performance in TFIs pertaining to advance rulings, governance and impartiality, and fees and charges, attaining or approaching best practice benchmarks. Conversely, other areas, notably internal and external cooperation, exhibit significant lags and deviations from top performers, having not yet reached the stage of effective implementation, nor attained an intermediate level of progress. Indicators encompassing formalities, trader involvement, and appeal procedures demonstrate intermediate performance levels. These findings are largely corroborated by the assessment based on the GSTF-PTI, where measures related to transparency and formalities exhibit notable improvement, while those concerning "cooperation and institutional arrangements" reveal persistent weaknesses that warrant attention in forthcoming reforms.

Future progress hinges on prioritizing reforms in underperforming areas, representing opportunities for improvement. The recently established " *Commission Nationale de Coordination pour la Facilitation des Procédures du Commerce Extérieur* " presents a significant opportunity to address these weaknesses, particularly within its remit of cooperation and institutional arrangements.

This study acknowledges potential methodological limitations due to inconsistencies arising from methodological variations and the scope of measures considered by the composite indicators. This underscores the crucial need for selecting appropriate indicators in future empirical work. A natural progression entails employing these indicators within quantitative studies supported by robust econometric models to enhance the conclusions' empirical grounding. Further research extending to countries similar to Morocco can validate the indicators' relevance and explore the construction of a trade facilitation index system tailored to the Moroccan context.

REFERENCES

[1] Arvis, J.-F., Duval, Y., Shepherd, B., & Utoktham, C. (2013). Trade costs in the developing world : 1995—2010. World Bank Policy Research Working Paper, 6309, 41.

[2] Arvis, J.-F., Ojala, L., Wiederer, C., Shepherd, B., Raj, A., Dairabayeva, K., & Kiiski, T. (2018). Connecting to compete 2018 : Trade logistics in the global economy. World Bank.

[3] Bamberger, J. M., Clark, M., & Sartorius, R. (2004). Monitoring and evaluation : Some tools, methods, and approaches (Working Paper 24614; Capacity Development Working Paper Series, p. 1-25). World Bank Group.

[4] Beverelli, C., Gourevich, I., Heiland, I., Keck, A., Larch, M., & Yotov, Y. V. (2023). Trade and Welfare Effects of the WTO Trade Facilitation Agreement (WTO Working Papers ERSD-2023-04; WTO Staff Working Paper). World Trade Organization (WTO).

[5] Beysenbaev, R., & Dus, Y. (2020). Proposals for improving the Logistics Performance Index. The Asian Journal of Shipping and Logistics, 36(1), 34-42.

[6] Bourdet, Y., & Persson, M. (2014). Expanding and Diversifying South Mediterranean Exports through Trade Facilitation. Development Policy Review, 32(6), 675-699.

[7] Chaoyu, L. (2023). How to Measure the Level of Trade Facilitation in a Small Area : Evidence from China. International Journal of Trade, Economics and Finance, 14(1).

[8] Chauhan, V. S., & Vijayakumar, S. (2021). Mea-sur-ing Trade Facilitation : Evidence from India (p. 1-31) [Working Paper]. Carnegie Endowment for International Peace - Carnegie India.

[9] CHEKROUNI, A., & BENCHEKARA, M. (2024). Assessing the impact of Trade Facilitation Agreement on Morocco's export performance : An ex-post analysis using structural gravity model. International Journal of Accounting, Finance, Auditing, Management and Economics, 5(4), 89-105.

[10] CHEKROUNI, A., & Mohamed, E.-Z. (2023). WTO Trade Facilitation Agreement in Morocco : Evidence using performance indicators analysis. African Scientific Journal, 3(20), 891-916.

[11] Cui, X., Lian, J., Li, F., & others. (2019). The impacts of provincial trade facilitation on China's provincial agricultural trade : An analysis based on China's trade facilitation survey data. China Rural Economy, 6.

[12] Dennis, A., & Shepherd, B. (2011). Trade Facilitation and Export Diversification. The World Economy, 34(1), 101-122.

[13] Desplatz, R., & Marc, F. (2016). Comment évaluer l'impact des politiques publiques ? Un guide à l'usage des décideurs et praticiens (p. 1-67) [Guide]. France Stratégie.

[14] ESCAP, & OECD. (2017). Indicators for Trade Facilitation : A Handbook (Version 1.0).

[15] Glewwe, P., & Todd, P. (2022). Impact Evaluation in International Development : Theory, Methods, and Practice. World Bank Publications.

[16] Grainger, A. (2008). Customs and trade facilitation : From concepts to implementation. World Customs Journal, 2(1), 14.

[17] Grun, R. E. (2006). Monitoring and evaluating projects : A step-by-step primer on monitoring, benchmarking, and impact evaluation (Working Paper 38983; HNP discussion paper series, p. 1-41). World Bank Group.

[18] Guner, S., & Coskun, E. (2012). Comparison of impacts of economic and social factors on countries' logistics performances : A study with 26 OECD countries. Research in Logistics & Production, 2(4), 330-343.

[19] Hillberry, R., & Zhang, X. (2015). Policy and Performance in Customs : Evaluating the Trade Facilitation Agreement. Policy Research Working Paper, 7211, 43.

[20] Hillberry, R., & Zhang, X. (2018). Policy and performance in customs : Evaluating the trade facilitation agreement. Review of International Economics, 26(2), 438-480.

[21] Hoekman, B., & Nicita, A. (2011). Trade Policy, Trade Costs, and Developing Country Trade. World Development, 39(12), 2069-2079.

[22] Hoekman, B., & Shepherd, B. (2015). Who profits from trade facilitation initiatives? Implications for African countries. Journal of African Trade, 2(1-2), 51-70.

[23] Huang, H. (2023). The Impact of Trade Facilitation on the Internationalization of Modern Logistics Enterprises in Yunnan Province. Academic Journal of Management and Social Sciences, 3(3), 88-93.

[24] Hunter, J. (2009). Monitoring and evaluation : Are we making a difference? Namibia Institute for Democracy.

[25] Jean-François, A., Lauri, O., Christina, W., Ben, S., Anasuya, R., Karlygash, D., & Tuomas, K. (2018). Connecting to Compete 2018 Trade Logistics in the Global Economy : The Logistics Performance Index and Its Indicators. The International Bank for Reconstruction and Development/The World Bank.

[26] Khandker, S. R., Koolwal, G. B., & Samad, H. A. (2009). Handbook on Impact Evaluation : Quantitative Methods and Practices. World Bank Publications.

[27] Kurochkin, D. (2013). Ocenka ehffektivnosti logistiki po metodologii vsemirnogo banka i ee korrektnost'[Logistics effectiveness assessment and its correctness according to the methodology of the World Bank]. Logistika i upravlenie cepyami postavok, 2(55), 16-22.

[28] Lee, H., & Kim, C.-S. (2012). The Impact of Trade Facilitation on the Extensive and Intensive Margins of Trade : An Application for Developing Countries. Journal of East Asian Economic Integration, 30.

[29] Moïse, E., Orliac, T., & Minor, P. (2011). Trade Facilitation Indicators : The Impact on Trade Costs (OECD Trade Policy Papers 118; OECD Trade Policy Papers, Vol. 118).

[30] Moïsé, E., Orliac, T., & Minor, P. (2011). Trade Facilitation Indicators : The Impact on Trade Costs. OECD Trade Policy Papers, 118.

[31] Moïsé, E., & Sorescu, S. (2013). Trade Facilitation Indicators : The Potential Impact of Trade Facilitation on Developing Countries' Trade". OECD Trade Policy Papers, 144.

[32] Moïse, E., & Sorescu, S. (2013). Trade Facilitation Indicators : The Potential Impact of Trade Facilitation on Developing Countries' Trade. OECD Trade Policy Papers, 144.

[33] Nguyen, A. T., Nguyen, T. T., & Hoang, G. T. (2016). Trade facilitation in ASEAN countries : Harmonisation of logistics policies. Asian-Pacific Economic Literature, 30(1), 120-134.

[34] OECD. (2018). Implementation of the WTO Trade Facilitation Agreement : The Potential Impact on Trade Costs. Trade Policy Brief.

[35] Orliac, T. (2012). The economics of trade facilitation. Institut d'Études Politiques de Paris-École Doctorale de Sciences Po.

[36] Peterson, J. (2017). An Overview of Customs Reforms to Facilitate Trade. Journal of International Commerce and Economics, 30.

[37] Portugal-Perez, A., & Wilson, J. S. (2012). Export Performance and Trade Facilitation Reform : Hard and Soft Infrastructure. World Development, 40(7), 1295-1307.

[38] Sakyi, D., Villaverde, J., Maza, A., & Bonuedi, I. (2017). The Effects of Trade and Trade Facilitation on Economic Growth in Africa. African Development Review, 29(2), 350-361.

[39] Seck, A. (2017). Trade facilitation and trade participation : Are sub-Saharan African firms different? Journal of African Trade, 3(1-2), 23-39.

[40] Shepherd, B. (2013). Trade times, importing and exporting : Firm-level evidence. Applied Economics Letters, 20(9), 879-883.

[41] Shepherd, B., & Wilson, J. S. (2009). Trade facilitation in ASEAN member countries : Measuring progress and assessing priorities. Journal of Asian Economics, 20(4), 367-383.

[42] Stepanova, V. S. (2022). On the Issue of Subjectivity of the Logistics Performance Index. Transportation Research Procedia, 61, 280-284.

[43] Tengan, C., Aigbavboa, C., & Didibhuku Thwala, W. (2021). Construction Project Monitoring and Evaluation : An Integrated Approach (1re éd.). Routledge.

[44] Töngür, Ü., Türkcan, K., & Ekmen-Özçelik, S. (2020). Logistics performance and export variety : Evidence from Turkey. Central Bank Review, 20(3), 143-154.

[45] United Nations. (2023). Digital and Sustainable Trade Facilitation : Global Report 2023 (p. 1-73). United Nations Regional Commissions (UNRCs) for Africa (ECA), Europe (ECE), Asia and the Pacific (ESCAP), Latin America and the Caribbean (ECLAC) and West Asia (ESCWA).

[46] Valensisi, G., Lisinge, R., & Karingi, S. (2016). The trade facilitation agreement and Africa's regional integration. Canadian Journal of Development Studies / Revue Canadienne d'études Du Développement, 37(2), 239-259.

[47] WCO. (2018). Glossaire of international customs terms. Word Customs Organization.

[48] WEF. (2016). The Global Enabling Trade Report 2016. World Economic Forum.

[49] Wilson, J. S., Mann, C. L., & Otsuki, T. (2003). Trade Facilitation and Economic Development : A New Approach to Quantifying the Impact. The World Bank Economic Review, 17(3), 367-389.

[50] Wilson, J. S., Mann, C. L., & Otsuki, T. (2005). Assessing the Benefits of Trade Facilitation : A Global Perspective. The World Economy, 28(6), 841-871.

[51] Wilson, J. S., Mann, C., Woo, Y. P., Assanie, N., & Choi, I. (2002). Trade Facilitation : A Development Perspective in the Asia Pacific Region. 156.

[52] World Bank. (2020). Doing Business 2020 : Comparing Business Regulation in 190 Economies. Washington, DC: World Bank.

[53] WTO (Éd.). (2015). Speeding up trade : Benefits and challenges of implementing the WTO Trade Facilitation Agreement. World Trade Organization.

[54] Yadav, N. (2014). Impact of Trade Facilitation on Parts and Components Trade. The International Trade Journal, 28(4), 287-310.

[55] Yushi, J., & Borojo, D. G. (2019). The impacts of institutional quality and infrastructure on overall and intra-Africa trade. Economics, 13(1), 1-35.

[56] Zaki, C. (2014). An empirical assessment of the trade facilitation initiative : Econometric evidence and global economic effects. World Trade Review, 13(1), 103-130.

[57] Zhanarys, Bakyt, Kamshat, Luiza, & Bakytzhamal. (2017). The Study of the Logistics Development Effectiveness in the Eurasian Economic Union Countries and Measures to Improve it. European Research Studies Journal, XX(Issue 4B), 260-276.

[58] Zhang, J., & Wu, Z. (2018). Effects of Trade Facilitation Measures on Trade Between China and Countries Along the Belt and Road Initiative. In W. Zhang, I. Alon, & C. Lattemann (Éds.), China's Belt and Road Initiative (p. 227-241). Springer International Publishing.

[59] Zou, M. (2022). The Impact of Trade Facilitation on China's Provincial Cross-border E-commerce Operational Performance under the « Dual Circulation » Development Pattern. Frontiers in Business, Economics and Management, 4(1), 145-152.

Moroccan tourism facing the Coronavirus:
What kind of scenarios?

HADDAJI Ibtissam

PHD student Limpact Lab- Cadi Ayyad University Marrakech

Ibtissam.haddaji@ced.uca.ma

Abstract

Since the end of the 1960s, Morocco is proud of its tourism industry and to continue to develop it, thanks to new projects and visions but, from the arrival of the health crisis covid-19 in 2019, the sectors of the Moroccan economy experienced major disruptions, including tourism, which is the second-largest contributor to gross domestic product (GDP) and job creator with revenues of 74 billion (DH) in 2018 according to the Moroccan Tourism Office, the closure of international borders has resulted in the cessation of activity but also to push experts and tourism professionals to reflect on the globality of the Moroccan tourism model and detect its structural and organizational failures knowing that the sector experienced well before a set of crises that impacted it, in our article we will try to shed light on tourism in Morocco before and after the appearance of covid-19 by trying to foresee solutions that will help revive long-term tourism in a new form by acquiring new projects.

Keywords: *Covid-19, tourism model, 2020 vision, post covid19 scenarios*

Introduction

Covid-19 destabilized the tourism sector worldwide before landing on Moroccan soil, in France, Spain… , did not escape this misfortune that left the world bluffed and unable to resist, so the Moroccan tourist cities suffered the same fate as the regions: Casablanca Settat, Marrakech Safi, Tangier fahs anjra, Fez-Meknes which recorded a very high rate of the pandemic (almost 63%) arrivals at the border posts experienced a drastic decrease of (-79%) in 2020 compared to 2019 with 2.8 million non-resident tourists, travel receipts of 2020 amounted to 36,4 billion dirhams, recording a loss of (-54%(compared to 2019. whatever impacting the economy and society, so how can we approach this problem? can we propose solutions that will make it possible to put in place one or more rigorous strategies that will give Moroccan tourism a boost as well as all the stakeholders in this sector? in our reflection, we will try to put in place a reliable plan based on the data provided by the institutions related to the Moroccan tourism sector after our analysis of the consequences of

these data on the proper functioning of all the components of the sector on the one hand and on the other hand on the future of Moroccan tourism in the medium and long term.

Fig1: Morocco's GDP growth projection
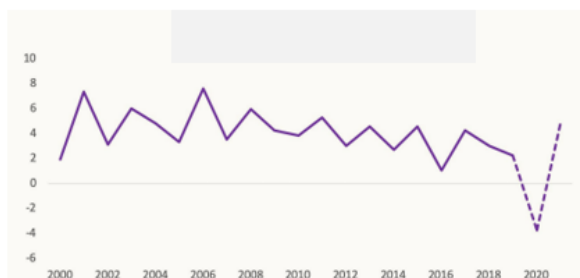
Source: IMF World Economic Outlook April 2020

the Moroccan Central Bank reported the decline in national growth rates for 2020 from 3.8% to 2.3% due to the combined effect of the poor cereal harvest and the spread of the pandemic worldwide, "Current conditions suggest we are heading for the weakest growth in the last 20 years"[1] , resulting in the deduction of the key rate of 25pbs at 2% to support national economic activity.

The National Tourism Confederation (CNT) estimated a loss of MAD 34.1 billion in tourism turnover for 2020 and MAD 14 billion in turnover loss for the hotel industry, and an overall fall of nearly 6 million tourists (-98%), which represents a loss of 11.6 million nights. It adds that at least 500,000 jobs and 8,500 businesses would be at risk, including classified tourist accommodation businesses, and tourist catering businesses, travel agencies, tourist transport companies and finally car rental companies.

The HCP said that almost 58% of companies (TPME) stopped their activities which left 30% of the workforce unemployed through the multiple economic crises that the mode has experienced, the tourism sector has resisted well but at this time of this global health crisis can we say that it will still face it? Will Moroccan tourism have the means and assets to do so? how? at what price? finally can we plan or implement a strategy for a tourism model after covid19?

Vulnerable tourism and series of crises

Morocco has exceptional assets: climate, diverse culture, historic cities and geostrategic positioning and despite its advantages, Tourism is suffering from several agitations since it has already overcome the economic crisis of 2008 thanks to the Moroccan financial system that respects the prudential rules of Basel in addition, it is characterized by its weak integration in global finance although tourism was less affected by this crisis by recording a slight increase of 2% of tourist arrivals in 2009, however the sector to continue to take more currencies (DH 53 million in 2009),[2] after overcoming this difficult stage, the sector has also experienced internal and external concerns, which mainly affect hotel financing, Morocco has continued to concentrate its efforts on improving tourism infrastructure at the level of known tourist cities (Marrakech, Agadir, Fes-Meknes) while making known the new promising tourist region: northern zone a

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[1] The High Commissioner for Planning. Al-Maghreb Bank

[2] the Ministry of Tourism

significant mobilization of domestic and foreign direct investment that achieved an annual increase of 5.24% between (2010-2016) during the same period, the State implemented the absolute exemption of the IS and the IR on the foreign currency turnover of hotel companies for a period of 5 years, thanks to its measures the markets of traditional tourist cities (Casablanca Marrakech, Agadir.) have experienced a very high tourism development noting that these cities are also the most affected by the Corona virus which leaves us foreseeing a strategic repositioning for tourism.

Fig2: distribution of tourist accommodation establishments
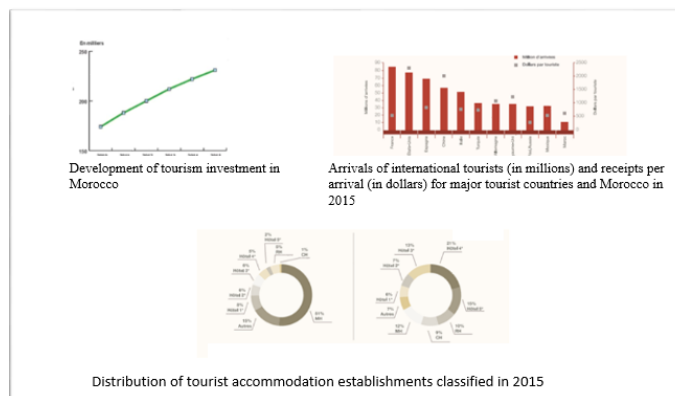
Sources: Ministry of Tourism, Directorate of Strategy and Cooperation, Al Maghreb Bank

A tourism vision 2020 and a program contract at the heart of global economic transformations

The main objective of the 2020 vision, is that Morocco will be one of the 20 largest global destinations and will establish itself as a reference in the Mediterranean region for sustainable development based on 5 main strategies:

- Capitalizing on the achievements of Vision 2010: correction of the gaps by National Program Contract (CPN) public-private [3]
- Moving to a more integrated approach to land use planning
- Develop the most differentiated resources in the territory by meeting the needs of the most promising markets
- Addressing persistent structural weaknesses in the sector
- Putting sustainable development at the heart of the strategy

Based on 6 strategic programs: Azur, Green/Eco/Sustainable Development, Heritage and Heritage, Animation-Sport, Niches and Biladi for 8 territories with tourism coherence, attractiveness and critical mass (with regard to hosting capacities, for example, etc.) in order to obtain good international visibility and so that

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[3] The State represented by: The Ministry of Tourism and Crafts - The Ministry of Economy and Finance - The Ministry of the Interior - The Ministry of Foreign Affairs and Cooperation - The Ministry of Equipment and Transport - The Ministry of Energy, Mines, Water and the Environment - The Ministry of Trade, Industry and New Technologies - The Ministry of National Education, Higher Education, Executive Training and Scientific Research - The Ministry of Employment and Vocational Training - The Ministry of Youth and Sports - The Ministry of Culture the private sector by: The General Confederation of Enterprises of Morocco - The National Federation of Tourism - The Professional Group of Banks of Morocco

each destination is able to offer a unique product while maintaining consistency with others

Note that the term: tourist territory refers to the tourist territorial division and the notion of the region refers to the administrative division.

Fig3: CPN Vision 2020 Programme Contract 30/11/2010

2020 objectives by tourist territory	Additional litter capacity (number of beds)	Non-resident tourists (in thousands)	direct jobs	Tou rec (M
Souss Sahara Atlantique	75 200	3 989	181 245	
Maroc Méditerranée	17 800	921	44 401	
Marrakech Atlantique	26 000	3 688	166 007	
Maroc Centre	20 700	2 791	128 973	
Cap Nord	28 300	2 777	128 020	
Centre Atlantique	12 500	3 800	179 630	
Grand Sud Atlantique	3 200	114	5 692	
Atlas Vallées	10 600	1 920	80 737	
Morrocco	194 300	20 000	914 706	1.

On the other hand, the price report of the accounts [4] includes the presence of an implementation of the PCRs including the projects launched to establish the tourism territories according to the predefined objectives of the 2020 vision, the reduction of the CPR cannot be done by simple actions because of the costs of commitments of tourism projects which rises to 77% for an investment capacity of 73% but still the development of the Azur stations remains difficult because of the no-compliance with the State's commitments in terms of support for the Azur plan as defined in the 2020 vision programme contract (investment premium, tax advantages to be implemented) includes Governance for the development of the tourism

product, So one can only wonder if the ambitions of the 2020 vision have taken into account the effects of the economic crisis? certainly the beginning of the crisis recorded a strong resistance that allowed the realization of tourism projects in the medium term until 2016 the vision 2020 was deeply affected by the terrorist attacks in some countries[5] and the variations observed on the power of buying tourists because of the economic crisis leading to major disruptions at international level. The course of accounts proposed a list of recommendations that can help the 2020 vision to maintain its balance such as:

-Implement the investment premium in accordance with the commitments of the national programme contract signed in 2010.

-The SMIT must have a status that provides special schemes at the level of tourist resorts (such as TMSA, Agence de Bouregreg, Agence Marchica, etc.), as well as a financial fund capable of developing tourism products.

-Set up governance bodies at the national and local level with support in training tourism businesses, or 6.7% or 9.3%. Finally, tourism jobs have, for their part, missed the 2015 objective: 507 Miles instead of 645 thousand jobs.

In fact, events have followed one another quickly and have somewhat hindered the achievement of the desired objectives of the 2020 vision the

[4] The summary of the special report No. 02/15/CH IV of the Course of Accounts

[5] The terrorist attacks of 13 November 2015 in Paris and 22 March 2016 in Brussels had considerable economic repercussions

economic crisis as it is quoted before that has reduced tourism growth by 2.2% in Europe especially which the latter is strongly linked The Arab spring and the rise of fundamentalism are also added to the Moroccan tourist market.

At the national level, the implementation of the governance model accompanied by an advanced regionalization whose launch was under the patronage of SM Mohamed 6 and the consultative commission on regionalization in 2010was difficult since only 25% of investments were operated for 2015 by focusing on the development of 8 tourist territories at the same time with major projects such as seaside resorts without taking into account the poor functioning of the institutes concerned or the different disagreements with some regional partners (RAM/ SMIT),[6] on the other hand, several agreements were signed on the sidelines of the CPN unfortunately they recorded a major delay. [7]

Thus, the Moroccan Tourism Department has drawn up a roadmap 2017-2021 that surely requires the participation and involvement of all stakeholders.

Moroccan tourism and covid 19: should it not be renewed?

In order to try to answer this question it must be remembered that the current difficult situation is an accumulation of all the historical events you Moroccan tourism among them the crises that have just been mentioned which are linked and make the Moroccan tourism model very depending on foreign tourists so it may be necessary tobe refocused on the domestic demand at least on a commutative basis at this level the sector is fragile and will not be able to undergo decisions or poorly calculated strategies but can even ensure a general diagnosis of Moroccan tourism outside all possible crisis? especially since the pandemic has focused on the failures and shortcomings of the Moroccan tourism model that hinders its evolution and resistance or even its reinvention is certainly a sector accustomed to crises but the covid19 crisis is a new experience that affects the whole world where the destinations are all closed which leads researchers and specialists in the sector to imagine several scenarios:

Fig4: nights in EHTC 2020

Projection nights in EHTC 2020								
March	April	May	June	July	August	Sep	Oct	Nov
1.302.091	50.703	129.151	400.784	1.252.645	1.510.273	1.112.340	1.609.740	1.553.817
-40%	-98%	-98%	-80%	-50%	-50%	-50%	-30%	-20%

Total nights lost	Average night price loss
March 2020	March August 2020
11.602.624	13.923.148.644

14 billion dh loss in hotel turnove

Included in average expenditure/touris

Total arrivals lost /tourist	lost time
March Dec 2020	
5.982.800	34.101.962.622

34.10 billion Dh loss in tourist turn

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[6] Speech by His Majesty King Mohammed VI on 3 January 2010

[7] As the Memorandum of Understanding «Creation of a centre of excellence in hotel management in Morocco», the Partnership Agreement on the establishment of a credit mechanism dedicated to the financing of tourism projects under the plans of Azur and Azur extension

Source: European Union Delegation to Morocco - Trade Section

Note on the economic impacts of Covid-19 in Morocco as of 26/03/2020

The Moroccan State recorded less returned due to the decrease in economic activities and a sharp increase in phosphate prices and interest rate, businesses have relied on government support to overcome this crisis because the latter has put in place measures to support households and businesses:

 - the creation of a Solidarity Fund on the initiative of His Majesty King Mohammed VI, a special fund with DH 10 billion initially plus other donors;

 - the payment of the (CNSS) was suspended for companies from 1 March to June 2020, they benefited from a moratorium on the repayment of bank and leasing loan maturities until 30 June 2020 with 0 fees.

 - the Central Guarantee Fund (CCG) has set up the "Daman Oxygène" product for small and medium-sized businesses with a turnover of not more than DH 200 million and intermediate companies with a turnover of between DH 200 million and DH 500 million.

 - For employees on temporary absence from work, they receive a lump sum of 2000 Dh in addition to family allowances and the AMO as well as the extension of the term of consumer and real estate credits until 30 June 2020.

On the other hand, professionals in the tourism sector are eagerly awaiting the definitive reopening of international borders to redress the bar and bring in foreign exchange revenues a situation that is well at stake and that knows an instability of the forced or temporary closure that threatens even more direct and indirect job losses or bankruptcy for some companies despite the fact that at this time of crisis they focus mainly on domestic demand the latter has been developed from In the 1980s, since it was not part of the public programs and policies of the tourism sector in the 1960s and 1970s, many economists defended it well, their ideas focused on the inability of developing countries to Professor Mohamed Berrianea writes about the moussems, which he believes are thematic fairs that have been created for years already constituting a group of pilgrims to memorize a saint annually sometimes some disappear as soon as they saw the day moussem represents for some anthropologist a staging of folklore it is also an object of study for geographers, sociologists, or political anthropologists recall that internal demand has potential on which would not interfere with currencies did not interest tourism professionals but can be said what can serve as an alternative or means of compensation of tourism international? especially at this time of global health crisis, at least what is certain is that it was a temporary solution at the time of the Gulf crisis (1990-1991) and the attack of the Atlas Asni hotel in Marrakech in 1994 by contributing to 28.4% of tourist nights compared to (-36.5%) of international tourist nights thanks to packages granted by professionals in the sector for the

benefit of Moroccan families during the different seasons private initiatives far from any institutional or associative intervention in 2000 the Moroccan State led a study that has its conclusions to encourage the Moroccan tourism policy especially after the crisis of September 11 to adopt the Kounouz Biladi operation in 2003, but beyond this weak point concerning the domestic demand other worries appear especially in c moments difficult if one excludes the disorder at the level of the informal tourist sector one notices that most of the public policies massively favors certain inland destinations such as Marrakech and seaside tourism while tourist demand is oriented towards the cultural riches of Morocco a high concentration of tourist products offers at the level of cities such as Casablanca, Agadir, Marrakech or Rabat and which benefits from 77.7% of the total nights a significant percentage that leaves little chance for other tourist regions, the supply and demand that are limited in this area make [8]

Impossible the expansion of the benefits of tourism especially in terms of jobs, and also led us to wonder on what model of development can mitigate this regional gap that results in territorial injustice in Morocco

The impact of climate change on Moroccan tourism

The tourist areas in Morocco are characterized by a particular comfort that is felt by the temperature, humidity etc… the country and the Mediterranean are among the five world tourist destinations[8] if the climate is sometimes too dry or too wet it disturbs the tourists who in general seek the balance between its data , public policies give more priority to a tourist product focused mainly on the beach and the sun which still makes the clients

 of a more vulnerable European majority and which can decrease its departures because of its climate change on this subject a vulnerability study of the Moroccan tourism sector to climate change was conducted on 13/04/2017 by associated international experts[9] and updated on 05/05/2017 at the request of the Ministry of Tourism in which a map of tourist comfort was used to show the impacts related to this notion of comfort according to the Mieczkowski index, developed in 1985

With a comfort scale from the daytime thermal comfort index, monthly rainfall, number of hours of sunshine and wind speed, A highlighting of the change in tourist comfort in Morocco compared to the main tourist competitors of Morocco such as the countries around the Mediterranean and southern Europe.

(From right to left)

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[8] The Mediterranean, Caribbean, Indian Ocean, Pacific Ocean as well as Australia and New Zealand.

[9] Carbone, Tec conseil, Marseille Associated international experts : S. Gössling, Professor,

Linnaeus University, Sweden Paul Peeters, Professor, Breda University/ NHTV, Netherlands

Map 1: ref map of the Mieczkowski index on the
Maghreb-Europe zone (1971-2000)

Map 2: Map of the evolution of the Mieczkowski index
over the 2021-2050 period
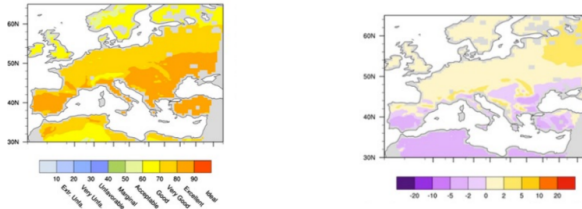
According to these two maps we notice the displacement of the tourist comfort zone towards the North and European countries with an increase in temperature and a decrease in precipitation, according to some experts the direct result of this change will trigger the departure of tourists to Europe it is only eventuality still according to them since the other models do not give the same result observed.

The major threat for Morocco is at the level of the Atlantic coast where the seaside sites are established especially those which know a strong fragility of the soils or slopes or the Mediterranean coast (erosion, submersion..) a situation that also disturbs the areas of animal and plant species, urban areas will not escape this bad fate then that the temperature will be high which will cause a degradation of the air quality pressure on the demand for energy and drinking water but especially will cause a huge stress on the residents

an uncomfortable sensation that will be detected especially in cities known by tourism such as Marrakech Fez, Meknes.

Mountainous and oasis areas are also affected, according to IRES [10] between 2040 and 2050 Zagora will experience a threshold of water stress Ouarzazate, the threshold of water shortage would also be reached in the same period, oases will need more water (67 to 380% in 2050) saw also the growth of the population which will overexploit the aquifers which will threaten the disappearance of the oases included the appropriate tourism in Atlas the fall of the snow because of the warming of the temperatures of the activities will stop like skiing which will threaten the development of tourism and these circuits (Oukaimden station).

The unpredictability of changes in post-Fordist tourism demand

If Morocco is mainly based on tourist attraction by seaside resorts especially with its main clientele Europe, the world has experienced a development of other tourist markets that changed the behavior during the holidays the desire to discover remote regions, the escape into nature a responsible ecological attitude that requires an adapted soft offer and that can be linked especially to rural areas today the «New tourism» favors the demand more than the offer in the selection of tourist products, so the tourist is independent free and can easily use the latest

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[10] Khattabi A., Chriyaa A., Hammani A., Moudoud B., (2014), Climate vulnerabilities and development strategies, Programme of studies «Climate change: impacts on Morocco and global adaptation options».

communication and information technologies to target a quality service or product that meets the standards of sustainable tourism so we are transiting towards individual tourism, mobile, Morocco must reinvest in this direction and not towards the coast by giving meaning to spontaneous demand the country is free from conventional investments and forms of old accommodation public policies must also become aware of these changes that some countries have known as the Mediterranean to adapt to the current crisis.

Long-term scenarios for post-covid Moroccan tourism

-Tourism scenario 2030

For a tourism transition in the context of tourism 2030, the objectives are based on a morphological analysis between tourism demand and supply, in this context the demand metric is based on the satisfaction scale among tourists according to the known psychological scale of Maslow.

Fig.7: tourist demand according to the hierarchy of needs

Source :
https://en.wikipedia.org/wiki/Maslow%27s_hierarchy_of_needs

1) *The option chosen by «Tourism 2030», focuses on the roles of public and private agents who participate together in improving the supply that becomes more important for countries with tourism products and whose largest investments are in the private sector, Morocco will have to make a heavy change since it is anchored at an initial stage compared to countries that have spent years in tourism if the 2010 vision marked the launch of the State in an evolutionary phase for a distinguished tourism product far from purely commercial approach the 2030 alternatives will be different and will focus essentially on the attribution to the future with heavy transformations of the whole tourist system a concentration on the development tourism and the good knowledge of the market, diversification of tourism products taking into account the common relations of public and private interests and the needs of tourists.*

2) *-Scenario towards a Sustainable Tourism*

3) *An awareness of the change that the future society will experience based on the sustainability of economic growth in parallel with the Blue Plan (UNEP) [11] which ensures cooperation between the 27 countries bordering the Mediterranean Morocco will then have to adopt a policy such as that adopted by advanced*

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[11] Located in Marseille, Bleu Plan is managed by an association under French law (law 1901) a team and experts who produce studies and scenarios for the future, to raise awareness among Mediterranean actors and decision-makers on environmental and sustainable development issues in the region

countries who have updated a set of conscious and responsible companies.

4) Our country will be able to adopt a strategy that prioritizes inland and rural tourism as a fundamental source for agricultural and craft populations, but also public policies must optimize the reception capacities within the tourist territories by putting in place regulatory legislative facilities to identify the tourist urban environment and natural sites a good financial contribution will ensure the proper management of cultural sites with the support of the private sector, the range of services will be diversified and other markets will appear beyond the traditional European market to global markets

5) -Scenario for a territorial tourism

6) Moroccan tourism is related to the territory and its development although the latter is a matter of public order unlike tourism which concerns the private sector or control of the public sector[12] a complexity that results from this given the actors involved in this development or the territorial recomposition that remains even more complex especially if we do not measure the consequential effects, Territorial tourism is launched from innovative tourism offers and products and adapted to the fundamental foundations of new territoriality by local actors who mobilize and create projects in partnership with the public sector, private or associative and

that take into account the impact of climate change on the tourism product of the territory this mobility of actors must also evolve and be attentive to the changes that tourism knows, heritage and why not involve a new actor (foreign project leaders) to lead to a new base of a new tourism such is the case of: The rosary of oasis of the zone of Ouarzazate[13] on mountainous and Osian areas, in the hinterland, retired tourists for the most part who are carriers of projects of life style, amenities and migrants. This need to take refuge in rural areas with a distinguished landscape to have a quiet lifestyle and high quality despite the fact that Morocco also knows the presence and construction of informal tourist territories that are organized around houses host, inns or gites sometimes not classified

7)

Fig8: the evolution of guest houses and other tourist establishments

	2017	2018	2019**	2020**
+ *Hostels*	29 721	30 813	31 818	32
+ Others*	26 294	27 727	28 887	30

Source: Statistics of the Ministry of Tourism

* Others: Hostels, Pensions, Motels and Gites, Camping, Real Estate Residences

It becomes very urgent to think of tourism after covid19 by activating an alternation of the current tourism model taking into account the

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I. [12] SAÏD BOUJROUF TOURISM AND REGIONAL PLANNING IN MOROCCO: WHAT ARRANGEMENTS? P. 12-19

13 (Oussoulous, 2019; Berriane et Nakhli, 2011; Oussoulous et Berriane, 2020)

maintenance of responsible and sustainable territorial tourism that associates with the new desired model in other words mass tourism that exists in its authentic form and new tourism that accentuates the territory and activate the tourist offers of the hinterland.

Conclusion

Morocco is in a conflict geostrategic zone since many experts foresee the existence of a conflict of civilizations, with its different economic dimensions, The crisis covid19 has revealed the undeniable assets of the State and civil society to face and resist the crisis of course there are gaps to fill lessons to be learned. The approach that Morocco must make is based on the conclusions reached by the studies of several Moroccan or foreign experts that relate to the traditional tourist demand that must be directed to the markets of the countries of East European Asia and America an expansion that will allow Morocco in the coming years to distinguish itself in the Mediterranean region. The development of new technologies and techniques of communication and information which implies the ecological dimension, cultural within the tourist offers will only increase the maturity and the quality of the tourist products.

At the individual level, the covid-19 crisis has taught us to focus more on finding a psychological balance and thus develop a strong expertise aware of the severity of the crisis and disaster management.

In the context of globalization and globalization competitiveness is fierce especially in terms of sustainability and quality, the Moroccan tourism model must be adapted by the commitment of the public sector, and public-private partnerships that will strengthen the implementation of land use plans and the smooth functioning of the knowledge society.

The Moroccan Tourism Office and the CRT have targeted domestic tourism with interesting promotional offers so that the Moroccan tourist can know how to visit the unknown regions of his country nevertheless it can be said that this initiative does not exist until of crisis it must be valid forever if really Morocco wants to take the path of sustainable tourism, territorial, the course is difficult but not impossible despite the covid19 crisis strategies can change with new assets to ensure tourism renewal.

Bibliography

Belghiti Alaoui, Abdelali, (2020), « Investing in health security now more than ever.", Policy Brief N°20-27, Policy Center for the New South

Berriane Mohamed, 1992, National tourism and leisure migration in Morocco, geographical study, Rabat, Faculty of Letters and Humanities, series «Thesis and dissertations», nº 16.

Berriane Mohamed, 1993, « Moussem in Morocco : tradition and change », Geography and cultures, Space and Culture Laboratory, no. 7, pp. 27-51.

Oussoulous, Nada, 2019, The emergence of a rural tourism destination and the role of foreign

residents: The case of the country of Ouarzazate, PhD thesis in Geography, Mohammed V University, Rabat, and Paul-Valéry University, Montpellier

Bleu plan, 2012, Tourism and Sustainable Development in the Mediterranean, Final Report, (consulted on 01 February, 2024)

AUTHORS INDEX

ABOUT THE EDITOR IN CHIEF

Prof. Dr. Hanaa Hachimi, Ph.D in Applied Mathematics & Computer Science and a Ph.D in Mechanics & Systems Reliability, I am Full Professor at National School of Applied Sciences, Ibn Tofail University of Kenitra, Morocco. President of the Moroccan Society of Engineering Sciences and Technology (MSEST). I am the Editor in Chief of "The International Journal on Optimization and Applications" (IJOA). I am Director of the Systems Engineering Laboratory (LGS) and IEEE Senior Member, precisely I am affiliated at the Big Data, Optimization, Service and Security (BOSS) team. I am Lecture and Keynote Speaker of the courses: Optimization & Operational Research, Graph Theory, Statistics, Probability, IA, Cryprograpgy, Reliability and Scientific Computing. I am Member of the Moroccan Society of Applied Mathematics (SM2A). I'm the General Chair of "The International Conference on Optimization and Applications" (ICOA) & the International Competition of Innovation (Let's Challenge). Lions Club Member and UNESCO UIT-Chair Member. Previously Associate Professor & ex-Secretary General of Sultan Moulay Slimane University in Beni Mellal.

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