Journal of Economic Cooperation & Development

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Editorial

This issue of the *Journal of Economic Cooperation and Development* includes nine papers that examine current drivers and efficiency of developing economies. Minh et al. examine the efficiency and the stability of the efficiency ranking of Vietnamese commercial banks. They find that the average efficiency under the assumption of constant returns to scale reached 80-88%, while the average efficiency under the assumption of variable returns to scale reached 86 - 91%. The non-parametric testing of the efficiency ranking showed that some banks had much lower efficiencies than other banks after carrying out M&A deals.

Chentoufi et al. examine the impact of socially responsible investment on the perspectives of the company's main stakeholders through three measures: the ROE ratio to identify managers interested in Return on Equity, the payout ratio for shareholders who expect dividends, and finally the Price to Book Ratio (PBR) to compare the book value of the company's assets with its market price in order to identify undervalued companies. The results obtained highlight positive impact of Very Engaged SRI on ROE was confirmed, while the CGEM CSR labelling negatively influences the dividend payment rate granted to shareholders, with a small difference noticed between the CSR labelled SRIs and those named Top Performer.

Faizi and Shirazi discuss the decline in tariffs and the increasing use of nontariff measures (NTMs) in countries constituting the Organization of Islamic Cooperation (OIC). They calculate frequency ratios (number of imports subject to NTMs), coverage ratios (Import value subject to NTMs), tariff equivalent (AVEs) of NTMs, and overall protection (protection provided by tariff and AVEs). They find that the AVEs of NTMs and overall protection have increased with a significant decline in simple average effectively applied tariff. As a result, NTMs evolved into a dominant source of overall protection. Thus, the paper recommends the OIC members to review and simplify the use of NTMs and harmonize with trading partners.

Alsaadi investigates whether combining Qard and commutative contracts is permissible according to Sharī'ah. He concludes by evidencing that the meaning of loan in the mentioned Hadīth is Qard, while this Hadīth also includes all commutative contracts since they are similar to sale. The paper also elucidates several forms pertaining to the combination of Qard and commutative contracts such as: a) combining Qard and commutative contract by a stipulation in the contract, b) combining Qard and commutative contract without a stipulation in contract, c) combining Qard and commutative contract without stipulation, prejudice, or collusion.

Hassan et al. examines the static and dynamic relationship within estimates of the influence of relative strength of Islamic finance on GDP growth for OIC countries and other nations. They find that Islamic finance has a strong positive relationship with economic growth. They address selection bias by using an iterative Markov Chain Monte Carlo method to fill in the missing variables; the results reinforce the primary findings.

Kantarci et al. examine tourism and travel competitiveness performances of the ten most-visited Muslim-majority countries with the aim to determine the power and the directions of the sub-competitiveness factors as well as reveal the differences among those countries. Findings indicate that Infrastructure Index shows the highest correlation with the Overall Competitiveness Index, followed by the T&T Policy-Enabling Condition index. On the other hand, the correlations between Enabling Environment and T&T Policy Enabling Conditions and, Enabling Environment and Natural-Cultural Resources is found to be negatively correlated which provides a vital issue for practitioners.

Riyadh and Hassan analyze the relationship between foreign reserves accumulation on export and foreign direct investment both short and long-run for Bangladesh, Ghana, India, Indonesia, Kenya, Nigeria, Pakistan, Philippines, Sri Lanka, Tunisia, and South Africa. Studying variables such as export, foreign direct investment, and gross fixed capital formation based on the ARDL/PMG method, FMOLS method, and DOLS method, they find that foreign reserves accumulation has a significant and positive impact on export and foreign direct investment.

Bugomaa determines the effects of regional trade agreements as well as the impact of political crises on the East African Community (EAC)'s imports with control of other traditional determinants of imports. He finds that regional trade agreements have disproportionate effects on EAC member countries' imports; Kenya beneficiates the most from these agreements given its advanced economic level. Political crises have disproportionate effects on EAC imports, with a higher negative impact found for Burundi due to the failed putsch in 2015.

Aladejare et al. identifies policy issues relevant to enhancing the determinants of quality of life: healthcare outcome, environmental factors, food security, income level, and natural resource utilization. Their study reveals that healthcare outcomes through high mortality rate, overuse of environmental factors and resulting ecological protection measures, and poor access to high-quality seeds and feeds devalue the quality of life in West Africa. However, higher-income and natural resource utilization promote the quality of life in the region.

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Reallocation and efficiency of Vietnamese commercial banks from 2008 to 2018

Nguyen Khac Minh¹, Phung Mai Lan², Nguyen Thien Luan³, and Pham Van Khanh⁴

ABSTRACT

This study applied DEA window analysis in combination with non-parametric testing to examine the efficiency and the stability of the efficiency ranking of Vietnamese commercial banks from 2008 to 2018, a very active period of M&A deals and resource reallocation. The estimation results of the window analysis model showed that the average efficiency under the assumption of constant returns to scale reached 80-88%, while the average efficiency under the assumption of variable returns to scale reached 86 - 91%. The non-parametric testing of the efficiency ranking showed that some banks had much lower efficiencies than other banks after carrying out M&A deals.

ملخص

طبقت هذه الدراسة نافذة تحليل مغلف البيانات (DEA) بالاقتران مع الاختبار غير المعياري لفحص كفاءة واستقرار تصنيف كفاءة البنوك التجارية الفيتنامية من 2008 حتى 2018، وهي فترة تعتبر نشطة للغاية من حيث صفقات الاندماج والاحتياز وإعادة تخصيص الموارد. وأظهرت نتائج عملية التقدير من خلال نموذج تحليل النافذة أن متوسط الكفاءة في ظل افتراض العوائد القياسية الثابتة بلغ 80-88%، بينما بلغ متوسط الكفاءة بافتراض العوائد القياسية المتغيرة 68-91%. كما أظهر الاختبار غير المعياري لتصنيف الكفاءة أن بعض البنوك تمتلك كفاءات أقل بكثير من البنوك الأخرى بعد تنفيذ صفقات الاندماج والاحتياز (M&A).

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ABSTRAITE

Cette étude a appliqué l'analyse de fenêtre DEA en combinaison avec des tests non paramétriques pour examiner l'efficacité et la stabilité du classement de l'efficacité des banques commerciales vietnamiennes de 2008 à 2018, une période très active d'opérations de fusion et d'acquisition (F&A) et de réaffectation des ressources. Les résultats de l'estimation du modèle d'analyse des fenêtres ont montré que l'efficacité moyenne sous l'hypothèse de rendements d'échelle constants atteignait 80-88%, tandis que l'efficacité moyenne sous l'hypothèse de rendements d'échelle variables atteignait 86 - 91%. Le test non paramétrique du classement de l'efficience a montré que certaines banques avaient une efficience beaucoup plus faible que d'autres banques après avoir réalisé des opérations de fusion et d'acquisition (F&A).

Keywords: DEA window analysis, banks, ranking statistics, mergers and acquisitions, Vietnam

JEL Classification: G21

1. Introduction

The Vietnamese banking sector has recently been under pressure from changes in legislation, the deepening and widening of the economy and a fiercely competitive trading environment. Therefore, each bank has needed to continuously improve its efficiency, especially compared to other banks, to remain competitive. Over the past ten years, Vietnam's commercial banking system has undergone a very thorough restructuring process. As a result, between 2012-2015, there were six successful M&A deals. The M&A activities have included 13 banks, causing the reduction of 7 joint-stock commercial banks.

Therefore, it is important to evaluate the efficiency of Vietnamese commercial banks, especially banks that have participated in mergers and acquisitions. Using panel data covering a sample of 26 Vietnamese commercial banks over the period from 2008-to 2018, the main contribution of this study was the use of DEA window analysis in combination with statistical tests to measure technical efficiency (TE), pure efficiency (PE) and scale efficiency (SE). Notably, this research examined the sampled banks' efficiency pre-and post-merger. It also

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evaluated the stability of the efficiency ranking of Vietnamese banks during M&A deals during the research period from 2008 to 2018.

The remainder of this paper is organised as follows: Section 2 reviews the related existing literature. Section 3 introduces this study's methodology, including DEA window analysis and the Kruskal-Wallis's test. Section 4 offers descriptive statistics concerning resource reallocation and commercial bank mergers in Vietnam. Additionally, it summarises the results of evaluating bank efficiency using the DEA window analysis model with a 3-year width, the results of the non-parametric test for the stability of efficiency ranking and other analyses. The last section contains the conclusion to this research.

2. Literature Review

Two common techniques measure banks' efficiency: (a) non-parametric and (b) parametric approaches. These techniques calculate banks' technical, scale, and cost efficiencies. The Stochastic Frontier Approach (SFA) is a non-parametric method often used to estimate efficiency (Berger and Humphrey, 1997; Fethi and Pasiouras, 2010; Mokhamad Anwa, 2018. In contrast, the most used parametric approach has been Data Envelopment Analysis (DEA) (Sathye, 2013, Sufian et al., 2014; Basilio et al., 2016; Rusydiana et al., 2019; Azad et al., 2021). Several studies have compared different estimation techniques (Rusydiana et al., 2019; Thiago, 2017; Ikra et al., 2021). DEA window analysis is another method that has been applied to analyse efficiency in many fields, such as energy, environment, finance, and banking. For example, Yue (1992) used DEA window analysis to evaluate relative efficiency in the banking industry. The author concluded that DEA window analysis helped indicate the best and worst banks relatively and the most stable and most variable banks, in terms of the average DEA in the research period. Asmild et al. (2004) used DEA window analysis, and the Malmquist index to examine the efficiency of Canadian banks. Řepková and Iveta (2014) applied DEA window analysis on Czech commercial banks' data and estimated the efficiency of the Czech banking industry between 2003 and 2012. Using panel data covering the period from 2005 to 2011 in Serbia, Savić et al. (2012) used extended DEA window analysis to evaluate the efficiency of banks.

In Vietnam, there has been some research regarding the efficiency of the commercial banking system, such as Minh *et al.*, 2013; Turnell and Vu, 2010; Nguyen *et al.*, 2018. For example, Minh *et al.*, 2013 used the superefficient model to estimate the efficiency of 32 Vietnamese commercial banks from 2001 to 2005. They then ranked the efficiencies to find the best and the worst banks in a relative sense. In general, these studies have only estimated efficiency based on DEA models, the Malmquist index or the Stochastic frontier production function and the window analysis approach, while the process of bank mergers and acquisitions was not examined.

Subsample	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
1	13.531	3	0.0036
2	25 488	2	0.0000

 Table 1: Sample Table

3. Methodology

The DEA approach was originally introduced by Charnes et al. (1978) based on the research of Farrell (1957). It can handle multiple inputs and outputs to estimate a firm's efficiency (Banker, 1984; Asmild et al., 2004). The DEA approach measures the relative efficiency of a set of decisionmaking units (DMUs) using multiple inputs to create multiple outputs. However, the basic DEA model (CCR), introduced by Charnes et al., (1978), measures technical efficiency (TE) under the assumption of constant returns to scale efficiency. The basic DEA model (BCC) was modified by Banker, Charnes, and Cooper (1984) from the CCR model to measure pure technical efficiency (PTE), which evaluated technical efficiency without scale efficiency effect (SE). There are some limitations to the DEA approach. DEA results cannot be interpreted confidently when the integrity of the data has been violated. Besides, efficient analysis relies only on one period, which hampers the measurement of efficiency changes, especially in cases that study the impact of reallocation on efficiency. Therefore, it is necessary to incorporate the time factor into efficiency analysis.

Window analysis is a method used to determine productivity changes over time, based on the principle of moving averages (Charnes *et al.*, 1995;

Cooper *et al.*, 2007; Savić *et al.*, 2012). In window analysis, each DMU in a different period is treated as a different DMU (independent); however, it can still be compared in the same window. Therefore, a bank's efficiency in a period can be contrasted against itself and against that of other banks (Asmild *et al.*, 2004). And a certain DMU at a given time can compare its efficiency at different times and with other firms' efficiency at the same time and at different times (Yue, 1992).

3.1. The DEA model measuring the efficiency of commercial banks

The DEA approach comprises a non-parametric model without any prior assumption concerning the production function to process the observed data. Consider a set of N decision-making units (DMU) (n = 1,2, ... N) in periods T (t = 1,2, ... T) (T = 2008-2018) using *m* inputs to produce the output *s*. Set DMU_{tn} to represent DMU*n* for a period of *t* with the input vector *m* and the output vector *s*.

For DMU k (k^{th} bank). Suppose y_{rk} (r = 1,2, s) is an output r, and x_{ik} (i = 1,2, ..., m) is the i^{th} input. To measure the efficiency of the DMU k, Charnes *et al.* (1978) proposed the following model. *Min* θ

> st. $\theta x_{ik} - \sum_{j=1}^{N} \lambda_j x_{ij} \ge 0, \qquad i = 1, 2, ..., m$ $\sum_{j=1}^{N} \lambda_j y_{rj} \ge y_{rk}, \qquad \mathbf{r} = 1, 2, ..., \mathbf{s}$ $\lambda_j \ge 0, \qquad j = 1, 2, ..., \mathbf{N}$ (1)

Optimal θ , denoted by θ^* satisfies the condition $0 \le \theta^* \le 1$. If $\theta^*=1$, then the DMU is the technical efficiency (TE), and the DMU is on the efficiency frontier. The above model is often referred to as the inputoriented model with constant returns to scale efficiency of Charnes-Cooper-Rhodes (CCR). The value of the objective function of the CCR problem is called technical efficiency (TE). To consider the variable returns to scale efficiency, the CCR model is extended to the BCC model as follows:

$$\begin{split} \underset{\theta,\lambda}{Min \,\theta} \\ st. \quad \theta x_{ik} - \sum_{j=1}^{N} \lambda_j x_{ij} \geq 0, \qquad i = 1, 2, ..., m \\ \sum_{j=1}^{N} \lambda_j y_{rj} \geq y_{rk}, \qquad \mathbf{r} = 1, 2, ..., \mathbf{s} \end{split}$$
(2)
$$\\ \sum_{j=1}^{N} \lambda_j = 1, \\ \lambda_j \geq 0, \qquad j = 1, 2, ..., \mathbf{N} \end{split}$$

The DMU operates under the assumption of variable returns to scale efficiency where an increase in inputs does not change outputs in the same proportion. The BCC model measures pure technical efficiency (PTE), ignoring the impact of scale, by only comparing the DMU with a unit of similar proportions. PTE measures how the DMU uses its resources in exogenous environments. *Low PTE implies that the DMU is inefficient in resource management*. Using the BCC model allows decomposition of the TE score into the pure technical efficiency score (PTE) and scale efficiency score (SE), where the relationship between them is shown as:

$$SE = TE / PTE$$
(3)

Scale efficiency (SE) measures how scale affects efficiency. SE also indicates management's ability to choose an optimal resource size, in other words, to select the production scale (bank activity in this study) that will achieve the expected level of production.

3.2. The DEA model measuring the efficiency of commercial banks

In this study, the window analysis model was used to analyse the efficiency for a sample of 26 Vietnamese commercial banks between 2008 and 2018.

Consider N DMU_s (banks) (n = 1,2, ... N) that use *m* inputs to produce *s* outputs in the period T (t = 1,2, ... T) (T = 2008-2018). Suppose that DMU^t_n represents observation *n* at period *t* with the input vector X^t_n and the output vector Y^t_n is given as:

$$X_{n}^{t} = \begin{bmatrix} x_{n}^{1t} \\ x_{n}^{2t} \\ . \\ . \\ . \\ x_{n}^{rt} \end{bmatrix}, \quad Y_{n}^{t} = \begin{bmatrix} y_{n}^{1t} \\ y_{n}^{2t} \\ . \\ . \\ . \\ y_{n}^{st} \end{bmatrix}$$
(4)

If the window starts at time k ($1 \le k \le T$) with window width w ($1 \le w \le T - k$), then the input and output matrices in the window analysis, respectively, are:

$$X_{kw} = \begin{bmatrix} x_1^k & x_2^k & \dots & x_N^k \\ x_1^{k+1} & x_2^{k+1} & \dots & x_N^{k+1} \\ \dots & \dots & \dots & \dots \\ x_1^{k+w} & x_2^{k+w} & \dots & x_N^{k+w} \end{bmatrix} \text{ and } Y_{kw} = \begin{bmatrix} y_1^k & y_2^k & \dots & y_N^k \\ y_1^{k+1} & y_2^{k+1} & \dots & y_N^{k+1} \\ \dots & \dots & \dots & \dots \\ y_1^{k+w} & y_2^{k+w} & \dots & y_N^{k+w} \end{bmatrix}$$
(5)

Adding these inputs and outputs to the above CCR and BCC models gives the window analysis problem as follows:

The CCR-DEA model of window analysis has the form:

$$\theta'_{k_{w}t} = \min_{\theta,\lambda} \theta, s.t: \left\{ -\lambda' X_{kw} + \theta' X_{t} \ge 0; \quad \lambda' Y_{kw} - Y_{t} \ge 0; \quad \lambda_{n} \ge 0 \ (n = 1, ..., N \times w) \right\}$$
(6)

The BCC-DEA model for window analysis has the form:

$$\theta_{k_w t}' = \min_{\theta, \lambda} \theta, st : \left\{ -\lambda' X_{k_w} + \theta' X_t \ge 0; \quad \lambda' Y_{k_w} - Y_t \ge 0; \quad \lambda_n \ge 0 \ (n = 1, \dots, N \times w), \quad \sum_{n=1}^N \lambda_n = 1 \right\}$$

$$(7)$$

Note that the choice of the window length is important in determining efficiency. Charnes *et al.* (1995) found that w = 3 or 4 tended to provide the best balance of format and stability of efficiency scores. A narrow window width must be used to ensure reliable results. Thus, a 3-year window was selected in this study (w = 3).

3.3. Banking model

There are many different views concerning selecting bank inputs and outputs (see Berger and Humphrey, 1997). However, based on this study's sampled data collected from 26 Vietnamese commercial banks, a

production model was used where the output consisted of; Y_1 total loans, Y_2 : Securities and Y_3 , operating income and the inputs included X_1 : fixed assets; X_2 : total deposits; X_3 : operating expenses.

3.4. Testing the stability of the efficiency rankings to evaluate the operations of banks carrying out M&A deals

Brockett and Kemperman (1980) and Brockett et al. (1998) provided typical examples of matrix construction transforming efficient scores to rank statistics. Such rankings can then be used to test trends or test stability. The efficiency matrix was observed from the window analysis given in Table 1 to apply this methodology. The set of N.k efficiency scores was ranked in ascending order (the middle-rank replaced ties) and denoted R_j to be the sum of the ranks corresponding to the DMU j (bank j in this case) given in Table 2. The sums of the individual ranks for each DMU (Bank) are given in the last column in Table 2.

Period (t)\DMU(j)	1	•••	k.
1	te ₁₁		te _{1k}
Ν	te _{N1}		te _{Nk}

 Table 1: Effective score matrix

Table 2. Ranking of effective matrix

DMU	1	•••	k.	Rj
DMU ₁	r ₁₁		r _{1k}	$R_1 = \sum_{j=1}^N r_{1j}$
DMU _N	r _{N1}		r _{Nk}	$R_{N} = \sum_{j=1}^{k} r_{Nj}$

The efficiency scores in Table 1 (te_{tj} , t = 1 ..., k; j = 1 ..., N) were generated by running a window analysis model in which N.k DMU (bank) was assessed, each value corresponding to one of N DMU at a window in kwindows. Using a single efficiency frontier to evaluate all N.k implicit observations assumed that no technical changes had affected production efficiency over k periods. This study aimed to identify trends when observing relative rankings based on each DMU (bank) score over time. Based on the method of Brockett and Kemperman (1980) (called BK) shown, the actual efficiency score was replaced in each efficiency matrix column with a corresponding ranking statistic by approving the scores in that column in ascending order. Accordingly, the ranking value matrix in Table 2 was obtained. As in the BK model, when an equal efficiency appears, it will replace these ranking positions with the middle value. A thorough discussion of these hypotheses can be found in Brockett *et al.* (1998) and Brockett and Kemperman (1980).

This study tested the hypothesis that all banks (N DMU) maintained their relative positions despite M&A deals during the study period.

The Kruskal-Wallis non-parametric ANOVA test was applied to examine this stability hypothesis (Brockett and Levine (1984)). For this test, there were simultaneously N "overall" (banks) under review, and the original hypothesis (H0) was that all N totals had the same score distribution. To apply this statistical method, the set of N.k points in ascending order were first ranked (equal positions were also taken in the middle-rank position), and the symbol Rj was the sum of the rank positions corresponding to the DMU (bank). The Kruskal-Wallis's test statistic was then calculated as follows:

a)
$$H = \frac{12}{N \cdot k \cdot (N \cdot k + 1)} \cdot \left(\frac{R_1^2}{k} + \frac{R_2^2}{k} + \dots + \frac{R_N^2}{k}\right) - 3 \cdot (N \cdot k + 1)$$

 $H \sim \chi^2_{N-1}$ with N-*I* degrees of freedom. If χ^2_{N-1} larger than χ^2_{N-1} at the desired significance level, the null hypothesis of the distribution of efficiency ratings like all DMUs (banks) was rejected given the significance level.

4. Data and Empirical Results

Data on the outputs (Y) and inputs (X) of the six banks carrying out M&As during the 2008-2018 period were used to estimate the above models. However, to understand in general what happened to these banks during the research period, statistical analysis on data regarding the Vietnamese commercial banking system has been provided below:

4.1. Statistical analysis of the basic indicators of Vietnamese commercial banks carrying out M&A

Table 3: Change in the number of Vietnamese commercial banks over the years

Type of banks	1997	2010	2015	2018
State-owned Bank	5	5	7	7
Joint-stock commercial bank	51	37	28	31
Joint-venture bank	4	5	5	5
Foreign bank branch	24	50	50	48
Foreign bank		5	5	9

Source: Annual Report - State Bank of Vietnam

Table 3 shows the number of Vietnamese commercial banks over the years. In the 2012-2015 period, merger and acquisition activities took place quite actively, mainly under the mandatory restructuring program of the State Bank, to ensure the safety of the credit institution system and to stabilise the money market. As a result, 6 successful M&A deals occurred. 13 banks participated in M&A activities, contributing to a reduction of 7 joint-stock commercial banks.

From 2011-to 2018, the total assets of all types of banks increased sharply. State-owned banks gained the largest increase (2.56 times), followed by joint-venture and foreign banks (2.08 times). Joint-stock commercial banks, which participated heavily in the M&A process, had the lowest rate of asset increase in 2011-2018 (2.01 times).

From the statistical data of the 26 largest Vietnamese banks, which account for 80% of the assets of the Vietnamese banking system, there were six major M&A deals between 2012-2018. Table 4 below outlines these six M&As.

No.	Time	Banks participating in M&As	Bank after M&As
1	2012	- SHB - Habubank	SHB
2	2012	- SCB - FicomBank - TinNghiaBank	SCB
3	2013	- HDBank - DaiABank	HDBank
4	2015	- Maritime Bank - MDBank	Maritime Bank
5	2015	- BIDV - MH Bank	BIDV
6	2015	- Sacombank - Southern Bank	Sacombank

 Table 4: Significant M&A deals between 2012-2018

Source: Compiled by the authors

The operations of the banks after mergers are specified in the table below. The values are expressed in Vietnamese Dong and deflated by the base year 2008. The most common point in the M&A deals pre-and post-merger is that the number of employees increased significantly, especially HDBank (up 203%). The bank with the lowest increase also reached 51% (SCB). The loan activities of the banks post-merger also saw significant growth, where, most notably, SHB increased by 346% and HDB increased by 279%.

However, the banks operating expenses also increased sharply after the merger and restructuring process, leading to fluctuations in the profits of the merged banks. Among the six banks that carried out M&A deals, three banks achieved positive net profit growth: HDBank, SHB and BIDV; the remaining three banks, Maritime Bank, Sacombank, SCB, saw sharp decreases in net profit. This outcome may also have been because some banks had to increase their expenses to handle bad debts, high human resource costs, and other expenses incurred after restructuring.

There was a decrease in net profits during the research period from 2008 to 2018. Declines in operating income were why banks not undertaking M&A activities suffered from decreased net profits. This group comprised the weakest banks with low lending, deposit, operating income, and net profit ratios regarding the merged banking group.

JG	Average	<u> </u>	re-merger		ď	ost-merger		6 (post	6 Change t/pre-merg	çer)
DAIIK	share	Labour	Fixed Assets	Net Profit	Labour	Fixed Assets	Net Profit	Labour	Fixed Assets	Net Profit
Sacombank	4.6%	7662	2905	2528	16028	4543	1284	109%	56%	-49%
SHB	4.2%	2040	1410	833	5225	2382	1161	156%	69%	39%
HDBank	1.9%	1339	229	420	4062	657	1502	203%	187%	258%
BIDV	9.3%	12.301	3017	8833	23604	5755	12812	92%	91%	45%
SCB	2.8%	2619	877	793	3964	2028	100	51%	131%	-87%
Maritime bank	3.0%	2399	433	844	3840	292	505	60%	-33%	-40%
Source: GSO annual fii	rm survey and	banks' annu.	al reports							

Table 5: Activities of the aquiring banks pre-and post-merger Unit: VND billion

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Womichic	Average	Banks without car	rrying out M&A	Acquired	Banks after aqui	iring other banks
Vallanc	2008-2018	2008-2012	2013-2018	banks	Pre-merger	Post-merger
Labour	2,182	2,607	5,759	1,030	3,312	6,158
Customer loans	56,156.9	66,298.8	83,528.2	14,283.1	82,712.7	138,744.2
Investment securities	14,179.9	17,436.8	22,036.6	2,497.0	16,264.1	31,204.7
Operating income	3,342.8	5,110.5	4,645.3	964.2	5,152.5	5,231.0
Fixed assets	989.8	1,020.3	1,170.7	457.8	1,903.9	2,654.3
Customer deposits	62,480.4	72,151.9	96,734.2	11,902.6	83,675.4	150,667.5
Operating expenses	1,480.4	2,109.3	2,176.7	383.3	1,987.6	2,703.1
Net profit	1,862.4	3,001.2	2,468.6	580.9	3,164.9	2,528.0
Source: GSO's annual enterp	orise survey and	I the annual report of	f the Vietnamese b	anking system		

Table 6: Operation of Vietnamese banks pre-and post-merger Unit: VND billion

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4.2. Estimated results of the window analysis model

4.2.1. TE of the system of commercial banks through window analysis with a 3-year window length in the 2008-2018 period

An overview of banks' efficiency by window analysis is presented in the summary of the estimation results of Model (6) shown in Table 7. This table provides general information about the TE in nine windows of 26 banks.

Variable	Obs	Mean	Std.Dev	Min	Max
2008-2010	26	0.834	0.086	0.659	1.000
2009-2011	26	0.845	0.099	0.645	1.000
2010-2012	26	0.805	0.103	0.623	0.992
2011-2013	26	0.844	0.090	0.650	1.000
2012-2014	26	0.868	0.080	0.699	0.997
2013-2015	26	0.824	0.131	0.518	1.000
2014-2016	26	0.833	0.130	0.603	1.000
2015-2017	26	0.805	0.136	0.603	1.000
2016-2018	26	0.811	0.140	0.583	1.000

Table 7: Summary statistics of the TE from estimation model (6) comprising26 banks with a 3-year window

Source: Window estimation model analysis results model (6) from banks' annual reports

The results in Table 7 show that the TE scores in the windows were all greater than 80%. The highest average TE was 86.8% in the 2012, 2013 and 2014 windows. The second was the 2011, 2012, 2013 windows, where the average TE reached 84.4%. There were two windows with the lowest efficiency out of the nine, which were the windows of 2010, 2011, 2012 and 2015, 2016 and 2017.

4.2.2. Average efficiency (TE, PTE and SE) of commercial banks through window analysis with a 3-year window length in the 2008-2018 period

The estimation results of Models (6) and (7) are summarised in Table 8. Table 8 presents the average TE, PTE and SE of commercial banks through window analysis with a 3-year window length between 2008-2018. The TE and PTE were estimated from the DEA model of window analysis (Model (6) and (7)), respectively, with a 3-year window length and with three inputs and three outputs. Each of the TE or PTE average efficiency plots in the table is the average of nine windows. Each window had three efficiency scores from the window Models (6) or (7) (for example, see Table 9 for the results of the window analysis by Model (6) for the six banks participating in mergers and acquisitions).

Name of Bank	ТЕ	РТЕ	SE	Name of Bank	ТЕ	РТЕ	SE
ACB Bank				Viet Capital			
	0.736	0.765	0.961	Bank	0.732	0.867	0.844
AB Bank	0.671	0.686	0.978	MaritimeBank	0.854	0.924	0.923
Eximbank	0.787	0.806	0.976	NamA Bank	0.719	0.803	0.895
VietinBank	0.897	0.988	0.908	HDBank	0.755	0.779	0.969
AgriBank	0.872	0.992	0.879	SCB	0.930	0.945	0.985
National				SaigonBank			
Citizen Bank	0.730	0.783	0.933	-	0.801	0.919	0.871
Lienviet				VPBank			
PostBank	0.787	0.843	0.934		0.900	0.940	0.957
BIDV	0.976	0.999	0.977	PGBank	0.833	0.945	0.881
MBBank	0.811	0.826	0.982	OceanBank	0.856	0.881	0.972
VIB	0.917	0.934	0.982	Sacombank	0.681	0.741	0.919
SeaBank	0.842	0.860	0.979	Techcombank	0.847	0.921	0.920
VietABank				Tien Phong			
	0.936	0.974	0.961	Bank	0.972	0.995	0.977
SHB	0.817	0.837	0.976	Vietcombank	0.921	0.977	0.942

Table 8: Average efficiency of the sampled commercial banks throughwindow analysis with a 3-year length between 2008-2018

Source: Estimated results from window analysis Models (6), (7) and banks' annual reports. Here: SE = TE / PTE

For the period 2008-2018, the average TE was calculated from the window analysis model under the assumption of constant returns to scale (CRS) (Model (6) presented in column 2 and 6. Table 8, ranging from 80% to 86%. This result shows that Vietnamese commercial banks were efficient. Therefore, the average level of inefficiency of Vietnam's commercial banking industry in the CCR model was in the range of 14-20%. The inefficiency of commercial banks was mainly due to the excess of customer deposits on the balance sheets and bad debts.

Estimating the TE of the banks showed that the banks which operated the most effectively, with average efficiency scores, according to nine windows in the research period, over 90% were: BIDV, VIB, VietABank, SCB, VP Bank, Tien Phong Bank and Vietcombank. On the other hand, the least effective banks with less than 70% efficiency scores were AB Bank and Sacombank.

The above shows the DEA efficiency score assuming constant returns to scale. However, this assumption cannot cover all cases in practice. Thus, this study also recalculated under variable returns to scale to solve this problem.

Columns 3 and 7 of Table 8 give the annual pure technical efficiency (PTE) scores of 26 banks in each window. The results show that the average efficiency calculated in Model (7) reached a value of 86 to 91%. Up to 50% of the banks had average PTE in the period over 90%. The number of banks with PTE under 70% only accounted for 3.8% of the sampled banks.

Other banks with efficiency scores of over 90% from the estimation results if Model (7) included VietinBank, AgriBank, TechcomBank, MaritimeBank, SaigonBank and PGBank. Also, in Model (7), the least efficient banks were AB Bank and Sacombank. PTE inefficiency was mainly due to management problems.

When comparing the results of Models (6) and (7), the model under variable returns to scale efficiency achieved a higher level of efficiency than the model under constant returns to scale efficiency. This result was due to Model (7) decomposing the inefficiency of production units into two components: the pure technical inefficiency and the inefficiency to scale and eliminate the part of the inefficiency caused by a lack of size of the production units. The mean scale efficiency of Vietnamese commercial banks was 94% between 2008-2018. Most banks were highly efficient.

The results of scale efficiency showed that the banking groups that were not as efficient as the other banks included large banks, such as Agribank and small banks, such as Viet Capital Bank and ABBank. This outcome confirmed that the choice of their scale of operations was not appropriate. 4.2.3. Window analysis for six banks carrying out M&As Window analysis captured the efficiency of banks after the reallocation of resources. Table 9 presents the results of estimating the window analysis model under the assumption of constant returns to scale with a 3-year window of six banks pre-and post-merger. The differences in the DEA scores of each bank reflected the performance of each bank and other banks over time.

CCR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average
BIDV	0.920	1.000	0.945									0.955
		1.000	0.946	0.996								0.981
			0.977	1.000	1.000							0.992
				1.000	1.000	1.000						1.000
					1.000	1.000	0.991					0.997
						1.000	0.994	0.997				0.997
							1.000	0.967	0.964			0.977
								0.936	0.931	1.000		0.956
									0.863	0.927	1.000	0.930
SHB	0.577	0.739	0.758									0.691
		0.743	0.762	0.571								0.692
			0.791	0.573	0.616							0.660
				0.724	0.674	0.829						0.742
					0.678	0.784	1.000					0.821
						0.647	1.000	0.975				0.874
							0.975	0.949	0.985			0.970
								0.897	0.932	1.000		0.943
									0.902	0.973	1.000	0.958
Maritime Bank	0.734	1.000	0.960									0.898
		1.000	0.960	0.766								0.909
			0.968	0.795	0.535							0.766
				1.000	0.615	0.698						0.771
					0.754	0.771	1.000					0.841
						0.757	0.983	0.920				0.887

Table 9:TE of banks pre-and post- mergers from the window analysis model under the assumption of constant returns to scale and window length of 3-years

CCR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average
							0.970	0.965	0.655			0.863
								0.841	0.654	1.000		0.832
									0.745	1.000	1.000	0.915
HD Bank	0.990	0.762	0.825									0.859
		0.764	0.825	0.653								0.747
			0.838	0.660	0.633							0.710
				0.814	0.809	0.935						0.852
					0.833	0.909	0.773					0.838
						0.874	0.717	0.705				0.765
							0.712	0.681	0.666			0.686
								0.614	0.601	0.665		0.627
									0.650	0.721	0.764	0.712
SCB Bank	0.867	1.000	0.866									0.911
		1.000	0.866	0.859								0.908
			0.917	0.875	0.800							0.864
				0.920	0.860	1.000						0.927
					0.964	0.755	1.000					0.906
						0.695	1.000	1.000				0.898
							0.970	1.000	1.000			0.990
								1.000	1.000	0.999		1.000
									1.000	0.968	0.940	0.969
Sacom Bank	0.566	0.778	0.821									0.722
		0.778	0.823	0.579								0.727
			0.853	0.610	0.548							0.670
				0.774	0.614	0.630						0.672
					0.788	0.740	0.722					0.750
						0.724	0.725	0.665				0.704
							0.715	0.672	0.654			0.680
								0.639	0.637	0.592		0.623
									0.622	0.578	0.549	0.583

Source: Estimation of Model (6) using data from annual reports of banks

BIDV was a highly efficient bank before acquiring MH Bank. Its Technical efficiency (TE) through the 3 - year windows 2008-2010, 2009-2011, 2010-2012, 2011-2013, 2012-2014, 2013-2015 was 0.955; 0.981; 0.982; 1; 0.997 and 0.997, respectively. However, after the merger with MH Bank, the efficiency of the three consecutive windows was 0.977, 0.956 and 0.930. The results of the restructured banks show that all indicators on credit, income, deposits, and fixed assets had generally increased, showing tremendous growth in scale. Especially after the M&A deals, the number of employees increased significantly, especially BIDV (up 92%). However, BIDV also had to bear bad debts and weaknesses from MH Bank; the efficiency of BIDV after the merger was still quite stable. This outcome proved the ability of BIDV's in the condition of increasing scale.

HDBank was considered a bank with efficient reductions after merging. The first window had efficiency scores of 0.99 in 2008, 0.762 in 2009 and 0.825 in 2010. In the second window, HDBank had efficiency scores of 0.764 in 2009, 0.825 in 2010 and 0.653 in 2011. Although its efficiency scores fluctuated slightly in the remaining windows, they tended to decrease since the merger in 2013. After the merger, the average efficiency level of these windows is 0,838; 0,765; 0,686; 0,627. By the last window of 2016-2018, the efficiency had increased higher than the previous windows but only reached 0.712. The efficiency of its BCC showed a similar trend.

Regarding M&A deals, the deal of Sacombank acquiring Southern Bank was also worth analysing because the results of the window analysis showed that the bank's TE scores compared to other banks in the sample were low. For example, starting in the first window with an efficiency score of 0.566 in 2008, 0.778 in 2009, and 0.821 in 2010. The average efficiency score of the remaining windows until the M&A deal was 0.859; 0.747; 0.710, and 0.852. After the merger, the efficiency level continued to decrease.

After their M&A deals, SHB, Maritime Bank and SCB Bank had good TE growth. For example, SHB's efficiency of windows was low before conducting M&A in 2012. SCB's average efficiency level in the three windows 2008-2010, 2009-2011, 2010-2012 was below 70%. However, after the merger, the average efficiency level increased significantly.

Although scale efficiency was expected to increase after the six bank's M&A deals, two banks had reduced scale efficiency, namely Sacombank and HDbank. Therefore, window analysis helped identify the best and worst banks in relative terms and the most stable and most variable banks in terms of their average DEA scores over the years.

4.2.4. Assessing the stability of banks

This section used a rank statistics approach to determine whether significant trends existed in each bank's performance patterns over time. With a certain level of statistical reliability, it was affirmed that the 26 banks maintained their relative efficiency rank positions over time.

The procedure was as follows: first, Model (6) was estimated with a window length of 3-years (9 windows). Each bank window had three efficiency scores, averaging an effective score. Thus, each bank had nine average efficiency scores. Thus, the twenty-six banks had 234 average efficiency scores.

After arranging the efficiency scores in a column in ascending order, the matrix of the ranking values shown in Table 10 was obtained. After conducting the efficiency matrix, Rj and Rj^2 were calculated according to the given formula in Table 2. As a result, Table 10 was completed.

N		2008-	2009-	2010-	2011-	2012-	2013-	2014-	2015-	2016-	
	Name of Bank/ window	2010	2011	2012	2013	2014	2015	2016	2017	2018	R
1	ACB Bank	129	115	139	149	174	214	204	205	202	1531
2	AB Bank	199	197	219	210	185	215	186	193	184	1788
3	Eximbank	137	53	86	84	76	195	188	192	212	1223
4	VietinBank	127	62	46	35	31	80	67	73	114	635
5	AgriBank	90	79	120	82	49	66	74	128	131	819
6	National Citizen Bank	75	39	94	154	164	227	223	224	218	1418
7	LienViet Post Bank	124	179	177	152	93	100	123	173	178	1299
8	BIDV	24	11	6	4.5	3	4	13	23	42	131
9	MBBank	207	211	208	96	15	12	25	147	159	1080

Table 10: Efficiency rankings of the sampled 26 banks

N		2008-	2009-	2010-	2011-	2012-	2013-	2014-	2015-	2016-	
	Name of Bank/ window	2010	2011	2012	2013	2014	2015	2016	2017	2018	R
10	VIB	99	33	40	37	18	88	91	89	19	514
11	SeaBank	121	143	165	145	135	56	102	59	77	1003
12	VietA Bank	72	45	110	48	92	32	4.5	4.5	4.5	413
13	SHB	190	189	206	166	133	95	16	34	22	1051
14	Viet Capital Bank	116	69	148	155	138	213	216	222	225	1502
15	Maritime Bank	71	60	157	156	117	81	106	122	54	924
16	NamA Bank	161	170	203	172	142	187	182	191	196	1604
17	HDBank	107	163	181	113	119	158	194	217	180	1432
18	SCB	58	61	104	44	63	70	9	2	17	428
19	SaigonBank	83	109	136	132	43	118	150	209	221	1201
20	VPBank	140	101	134	47	50	68	65	21	5	631
21	PGBank	141	111	105	38	85	171	160	144	108	1063
22	OceanBank	30	41	112	87	36	146	151	167	125	895
23	Sacombank	176	175	201	200	162	183	198	220	226	1741
24	Techcombank	169	153	168	130	126	78	20	51	27	922
25	Tien Phong Bank	4.5	4 5	7	57	52	4.5	4 5	10	29	173
26	Vietcomank	98		103	28	26	14	8	55	64	493

Source: Estimation based on the efficiency ranking matrix calculated from Model (6)

The value of Kruskal-Wallis H statistics was computed, using the information given in Table 10, resulting in:

$$H = \frac{12}{9*26(9*26+1)} \left(\frac{R_1^2}{9} + \dots + \frac{R_5^2}{9}\right) - 3(9*26+1) = 55.85$$

The value of H, when compared to $\chi^2_{25}(0.005) = 46.93$ allowed the rejection of the H₀ hypothesis regarding the distribution of the same efficiency ranking of the 26 banks conducting M&As at a significance level of 0.005. Rejecting the H₀ hypothesis concluded that some banks exhibited better economic performance than others, measured by inputs and outputs and incorporated into the model. Thus, the results of statistical

testing also confirmed that through the merger and acquisition deals, some of the banks still operated far worse than others.

From the calculated value of R, the least efficient bank was AB Bank, with an R value of 1788, followed by SacomBank, Nam A Bank, Viet Capital Bank and ACB Bank.

4.2.5. Sensitivity analysis

Two models were examined to see how banking efficiency through window analysis changes when using different input and output options. The original model, Model (6), used the asset approach, where three inputs and three outputs were selected and was called the M_0 model. The model to be compared was Model (6) using the production approach, comprising the four outputs: Y_1 : total loans; Y_1 : securities; Y_3 : operating income and Y_4 : operating expenses and two inputs: X_1 : fixed assets and X_2 : total deposits, this model was called the M_1 Model.

The method was conducted as follows:

Step 1: First, Model M_0 was estimated under the assumption of constant returns to scale efficiency (Model (6)) and variable returns to scale efficiency (Model (7)) to calculate TE, PTE, and SE according to nine windows and denoted TE₃₃, PTE₃₃, SE₃₃. Next, Model M_1 was estimated under the assumption of constant returns to scale efficiency (Model (6)) and variable returns to scale efficiency (Model (7)) to calculate the TE, PTE, and SE according to nine windows and denoted TE₂₄, PTE₂₄, SE₂₄. There were six banks and nine windows. Thus, there were 54 observations for each efficiency series.

Step 2: The basic statistics for the TE, PTE and SE series were calculated and then transferred to Table 11 corresponding to the efficiency columns. Autocorrelation of the series {TE₃₃, TE₂₄}, {PTE₃₃, PTE₂₄} and {SE₃₃, SE₂₄} was tested.

 $H_0: \rho = 0$ $H_1: \rho \neq 0$

Step 3: The Spearman rank correlation for each pair of series {TE₃₃, TE₂₄}, {PTE₃₃, PTE₂₄}, {SE₃₃, SE₂₄} was calculated and recorded in the table. For example, the Spearman correlation of PTE₂₄ and PTE₃₃ of 0.620 was listed in the first row in the common column for these two series.

Variable	PET33	PET24	TE33	TE24	SE33	SE24
Spearman's p		0.740		0.570		0.376
Pror> t		0.000		0.000		0.000
Mean	0.882	0.764	0.830	0.637	0.942	0.833
Std.Dev	0.109	0.205	0.113	0.208	0.060	0.142
Min	0.614	0.240	0.518	0.170	0.620	0.274
Max	1	1	1	1	1	1
Obs	234	234	234	234	234	234

Table 11: Sensitivity analysis to determine the correlation between efficiencies from different input and output options

Source: Author calculated from the estimation results for models (6) and (7) with different input and output options.

The 5th row from the bottom of Table 11 shows the average of each efficiency series. The average value of TE estimated from Model (6) with a choice of three inputs and three outputs (M₁) was 0.83. In contrast, the TE from Model (6) with two inputs and four outputs was 0.637, the correlation coefficient of these efficiency series was 0.57, the probability of rejecting hypothesis H₀ was 0.000. This result proved that the window analysis model for the TE results from M₀ and M₁ was highly correlated. The correlation between PTE from M₀ and M₁ was higher than the correlation of the TE series from M₀ and M₁; this situation was because the two series correlation coefficient was 0.74, higher than 0.57. In particular, the scale efficiency derived from the two models with SE = PTE / TE had the lowest Spearman correlation coefficient (0.376). However, hypothesis H₀ ($\rho = 0$) was also strongly rejected.



Figure 1: Movement trend of the TE scores from estimation from M₀ and M₁

Source: Estimation of the Model (6) using data from annual reports of banks

Thus, using the window analysis approach, whether the asset or the production approach to analyse the efficiency of banks carrying out M&A deals, the TE, PTE, and SE were derived from the models having very high correlations.

The TE scores of the movement trend from the estimation of M0 and M1 can be seen in Figure 3 below. The figure clearly shows the correlation between the two efficiency chains from the two different input and output selection approaches.

The movement of efficiency was estimated from two different input and output options. Although the absolute values differed, they had a similar trend, which was the expected result.

5. Conclusion

This study applied the window analysis and non-parametric test approaches to estimate the TE, PTE, and SE of 26 Vietnamese commercial banks between 2008 and 2018. In addition, it tested the stability of the efficiency rankings. Window analysis helped to identify the best and worst banks in relative terms and the most stable and most variable banks in terms of their average DEA efficiency scores when compared to other banks and themselves over time. The integration of window analysis into the M&A process offered a better understanding of banks' ongoing competition and acquisition processes. The non-parametric testing showed that not all M&A deals gave banks better management and a more appropriate scale. The sensitivity analysis further strengthened these results because even if different input and output options were used, the analytical rank was still preserved.

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APPENDIX

Window 1	2008	2009	2010								
Window 2		2009	2010	2011							
Window 3			2010	2011	2012						
Window 4				2011	2012	2013					
Window 5					2012	2013	2014				
Window 6						2013	2014	2015			
Window 7							2014	2015	2016		
Window 8								2015	2016	2017	
Window 9									2016	2017	2018

Table 1. Describe the lengths of windows
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The performance of socially responsible investments in the eyes of stakeholders

Mohammed Alami Chentoufi¹, Tarek Zari² and Jamal Tikouk³

ABSTRACT

Most previous studies on the financial performance of socially responsible investments have focused on measuring profitability in relation to conventional investments. The purpose of this studies is analyzed in details the nature of this profitability in regards to the expectations of the company's stakeholders. Using stakeholder theory, this study examines the impact of socially responsible investment on the perspectives of the company's main stakeholders through three measures: the ROE ratio to identify managers interested in Return on Equity, the payout ratio for shareholders who expect dividends, and finally the Price to Book Ratio (PBR) which is of great interest to speculators who can compare the book value of the company's assets with its market price in order to identify undervalued companies. The results obtained highlight positive impact of Very Engaged SRI on ROE was confirmed (+0.29), while the CGEM CSR labeling negatively influences the dividend payment rate granted to shareholders, with a small difference noticed between the CSR labeled SRIs and those named Top Performer (-0.24 vs. -0.21). The interest of the managers for this type of investment, then they locate an important aversion on behalf of the speculators and shareholders considering that the SRI impacts negatively their business.

ملخص

ركزت معظم الدراسات السابقة بشأن الأداء المالي للاستثمارات المسؤولة اجتماعيا على قياس الربحية فيما يتعلق بالاستثمارات التقليدية. ويتمثل الغرض من هذه الدراسات في تحليل طبيعة هذه الربحية بالتفصيل فيما يتعلق بتوقعات أصحاب المصلحة في الشركة المعنية.وباستخدام نظرية

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أصحاب المصلحة، تبحث هذه الدراسة في تأثير الاستثمار المسؤول اجتماعيا على وجهات نظر أصحاب المصلحة الرئيسيين في الشركة من خلال ثلاثة مقاييس: نسبة العائد على حقوق المساهمين لتحديد المديرين المهتمين بالعائد على حقوق المساهمين (ROE)، ونسبة الدفع للمساهمين الذين يتوقعون أرباحا، وأخيرا نسبة السعر إلى القيمة الدفترية (ROR) والتي تعتبر ذات أهمية كبيرة للمضاربين الذين يمكنهم مقارنة القيمة الدفترية لأصول الشركة مع سعر السوق من أجل تحديد الشركات المتدنية القيمة. وأبرزت النتائج التي تم الحصول عليها أن التأثير الإيجابي للاستثمار المسؤول اجتماعيا (SRI) الشديد على العائد على حقوق المساهمين بلغ (20+)، في حين أن تصنيف علامة المسؤولية الاجتماعية للاتحاد العام لمقاولات المغرب (SEC) يؤثر سلبا على معدل دفع الأرباح الممنوحة للمساهمين، مع ملاحظة اختلاف بسيط بين علامة المسؤولية الاجتماعية للاستثمار الأرباح الممنوحة للمساهمين، مع ملاحظة اختلاف بسيط بين علامة المسؤولية الاجتماعية للاستثمار المسؤول اجتماعيا وتلك المدرجة ضمن الأفصل أداء (20-). فيما يتعلق بمصلحة الأرباح المنوحة للمساهمين، مع ملاحظة اختلاف بسيط بين علامة المسؤولية الاجتماعية للاستثمار المسؤول اجتماعيا وتلك المدرجة ضمن الأفصل أداء (20-). فيما يتعلق بمصلحة الأرباح المنوحة للمساهمين، مع ملاحظة اختلاف بسيط بين علامة المسؤولية الاجتماعية للاستثمار المسؤول اجتماعيا وتلك المدرجة ضمن الأفصل أداء (20-). فيما يتعلق بمصلحة المسؤول اجتماعيا وتلك المدرجة ضمن الأفصل أداء (20- مقابل 20-). فيما يتعلق الم الم

ABSTRAITE

La plupart des études précédentes sur la performance financière des investissements socialement responsables se sont concentrées sur la mesure de la rentabilité par rapport aux investissements conventionnels. L'objet de cette étude est d'analyser en détail la nature de cette rentabilité au regard des attentes des parties prenantes de l'entreprise. En utilisant la théorie des parties prenantes, cette étude examine l'impact de l'investissement socialement responsable sur les perspectives des principales parties prenantes de l'entreprise à travers trois mesures : le ratio ROE pour identifier les gestionnaires intéressés par le retour sur capitaux propres, le ratio de distribution pour les actionnaires qui attendent des dividendes, et enfin le ratio Price to Book (PBR) qui est d'un grand intérêt pour les spéculateurs qui peuvent comparer la valeur comptable des actifs de l'entreprise avec son prix de marché afin d'identifier les entreprises sousévaluées. Les résultats obtenus mettent en évidence l'impact positif de l'ISR Very Engaged sur le ROE (+0.29), tandis que l'étiquetage RSE de la CGEM influence négativement le taux de paiement des dividendes accordés aux actionnaires, avec une faible différence constatée entre les ISR étiquetés RSE et ceux nommés Top Performer (-0.24 vs. -0.21). L'intérêt des dirigeants pour ce type d'investissement, puis qu'ils situent une aversion importante de la part des spéculateurs et des actionnaires considérant que l'ISR impacte négativement leur activité.

Keywords: Econometric study, social responsibility, Profitability, Stakeholders, Morocco.

JEL Classification: G32, G11, M14, Q56.

1. Introduction

SRI translates the commitment of the company in parallel to its main economic mission to respect the environment, society, and to integrate its various stakeholders in the decision-making process.

Several studies have tried to quantify the links between SRI and financial performance using meta-analyses in order to identify a generalized trend, but they give opposite results regarding the impact of SRI on financial performance. Scientific research on social responsibility, from the pioneering work to the present day, has focused more on the study of profitability as the key determinant of financial performance, while few studies have explored and detailed the nature of this profitability in relation to the intentions and interests of the company's stakeholders.

The relevance of this article is seen in its new vision to treat a question already treated by others researches. Indeed our objective is to enrich the debate on this problem, from a different point of view which will give more insights on the nature of this link between SRI and financial performance (Q1) to managers (Q1.1), shareholders (Q1.2) and speculators of the SRI (Q1.3) in a specific context which is the Moroccan economy. From the above, our research is interested in the impact study of SRI on the financial performance of Moroccan companies listed on the stock exchange. From the above, this research about the impact of SRI on the financial performance of Moroccan listed companies on the stock exchange leads mainly to the following research question:

"How can the application of extra-financial criteria on investments impact the financial performance of listed Moroccan companies and subsequently influence the attitude of their stakeholders?"

This main question will be divided into three sub-questions depending on the level of influence SRI has on stakeholder attitudes, as financial performance can be interpreted from different perspectives. Firstly for managers, the "ROE" measures the profitability of capital employed. It indicates the ability of managers to use the resources provided by shareholders.

Q1.1: How can the application of extra-financial criteria on investments impact the ROE of listed Moroccan companies?

Secondly, the "payout ratio" represents the share of the company's profit paid out to shareholders in the form of dividends, because maximizing the company's profitability necessarily involves making profits for the shareholders.

Q1.2: How can the application of extra-financial criteria on investments impact the Payout of listed Moroccan companies?

Finally, the Price to Book Ratio is a measure if a stock's price accurately reflects its financial value. Speculators use it to determine if the purchase price of a company reflects its true book value in the market.

Q1.3: How can the application of extra-financial criteria on investments impact the PBR of listed Moroccan companies?

2. Literature Review

SRI has attracted the interest of several academic studies that have treated the question of the financial profitability of SRI. The objective is determine whether the integration of social criteria in the investment choice creates value or destroys it. The period between 1972 and 2019 has generated several studies with opposite conclusions.

Markowitz (1952) through his pioneering work concluded that socially responsible investments generate profitability and earnings. For modern portfolio theory Markowitz (1952) SRI limits investment opportunities and allows for less diversification capacity because of the selection problems it imposes.

In the same context, Milton Friedman (1962) in his book, "Capitalism and freedom" criticizes SRI, and concludes that there is no compatibility between socially responsible investment and profitability. Taking social and environmental concerns into account can lead to additional external costs that must be internalized and lead to a loss of corporate value. However Clow (1999) shows that SRI, by its selective approach, would cause a sectoral bias by limiting itself to a small number of investment sectors, thus is increasing its risk while decreasing its profitability. Nevertheless, SRI, according to modern portfolio theory, causes a competitive disadvantage because it will generate costs for the company that must be borne by the state (Brammer and al., 2006). Girerd-Potin and al. (2014) used scores from Vigeo reports between 2003 and 2010 to

express the CSR dimensions of companies. These are the "business actors" dimension namely employees, customers and Suppliers..., "social actors" dimension represented by the environment and society, and the "financial actors" dimension which are shareholders and creditors. The authors integrated the three dimensions into the Fama and French (1993) model after measuring the performance gap for all dimensions. The results highlight an additional risk premium is required by investors to have a stock with a low CSR rating.

On the other hand, the stakeholder theory proposes an integrative approach in which all stakeholders participate in defining the strategy. Freeman (1984) was the first to use this term, believes that a stakeholder is a "person or group of people without whose support the company would not exist". The authors who have been interested in this theory have identified several classifications of the company's stakeholders, whether legitimate/non-legitimate, primary/secondary, internal/external, or influencer/non-influencer. For the "information effect" theory, Kurtz (2002) asserts that SRI generates value in the long run in the sense that the extra-financial rating can be interpreted as a reflection of a certain control of the risks faced by the company. This positive correlation between financial performance and SRI is justified by Margolis and Walsh (2003) who identified only 08 studies out of the 127 that found a negative correlation between the two dimensions. Adeneye and Ahmed (2015) tried to determine the nature of correlation between CSR and MBV index based on 500 British companies. They found that there is a positive effect between MBV and CSR but a neutral effect between CSR and firm size. Platonova and al. (2016) concluded that socially responsible stocks outperform conventional stocks in terms of performance, when they measured the CSR of 24 Islamic banks matched with other conventional firms using the content analysis method.

Same results obtained by adopting the methodology of Maqbool and Zameer (2017) who opted for content analysis study and they found a positive effect between CSR and financial performance of 28 Indian banks listed in Bombay Stock Exchange. For Schönborn (2019) and al. also found a positive effect between CSR measured by questionnaires that define socially responsible business culture on financial performance.

On the other side, Marsat and al (2013) find that the firm is not socially committed does not impact its financial performance. Also, Xiao and al

(2013) measured the impact of a sustainability score on the financial performance of companies by integrating a social responsibility factor into the Fama and French (1993) model, the authors measure the weighted return differential of socially rated portfolios and those with poor ratings. The study concludes that returns on socially responsible stocks are similar to returns on conventional stocks. The same results are confirmed by the works of Adeneye and Ahmed (2015), based on 500 UK companies. The authors found a neutral impact between CSR and firm size effect.

Indeed, the heterogeneity of the results concerning the impact of SRI on the financial performance of companies is mainly attributable to the different angles from which the authors have approached this question. The originality of this article lies in its global vision which takes into account the financial performance under several facets, namely, managerial by aiming at the capacity of the managers of the SRI funds to carry out returns, without forgetting the expectations of the shareholders and the speculators, which will make it possible to better define our problem.

3. Data and Methodology

First we will provide a detailed discussion of the variable selection process.

3.1. Independent variable: Socially Responsible Investment (SRI)

The SRI is the result of a cross combination between the Vigeo-Eiris Morocco ranking which names the top performers each year and the CGEM CSR label to distinguish between three categories in terms of social responsibility: Very committed investments "Very. Eng" named by Vigeo-Eiris as "Top Performer", "Eng" labeled CSR by the CGEM, and "N.Eng", which represent companies not considered responsible and focus on profitability as main goal, over environmental consequence of their activities. El Malki (2012,2014), Simionescuand al (2014), Chettyand al (2015), Masoud and Halaseh (2017), Lin and al (2018)

3.2. Dependent variables

The literature review of empirical studies shows that works measuring the impact of SRI on profitability are abundant, but few works have

operationalized this profitability through variables reflecting the intentions of the company's stakeholders. For this reason, financial performance is measured by three variables: ROE to identify the behavior of managers interested in Return on Equity (ROE), the payout ratio targeted by shareholders who expect the distribution of dividends, and finally the Price to Book Ratio (PBR), which capture the interest to speculators interested by comparing the book value of the company's assets with its stock market price.As a consequence, weopt for two categories of socially responsible investment; the first category concerns the Highly Committed Investments named by Vigeo-Eiris and the Committed Investments labeled by the CGEM.

3.2.1. ROE

The "Return on Equity" is an accounting profitability indicator that measures the profitability of capital employed. It indicates the ability of managers to use the resources provided by shareholders. A high and constant ROE means that the company has a sustainable competitive advantage. Jiang and Yang (2015); Angelia and Suryaningsih (2015); Dumitrescu and Simionescu (2015); Chettyand al. (2015); Maqbool and Zameer (2017).The formula of the indicator is:

$$ROE = \frac{Benefice}{VNC} \tag{1}$$

3.2.2. Payout ratio

The payout ratio represents the share of the firm's profit paid to shareholders in the form of dividends. Several authors have measured the profitability of investments by the payout ratio as Attigand al,(2014); Benlemlih and Bitar, (2016).

$$Payout \ ratio = \frac{Dividend \ per \ Stock}{BPA}$$
(2)

According to stakeholder theory (Freeman, 1984), the adoption of responsible behavior is in response to the necessity of maximizing corporate objectives through profitability for the benefit not only of shareholders but also of other stakeholders. Gallo (2004); Allouche and Laroche (2005); He and al. (2012).

3.2.3. Price to book Ratio

The Price to Book Ratio is a measure if a stock's price accurately reflects its financial value. Speculators use it to determine if the purchase price of a company reflects its true book value in the market. Although standards across industries vary, a PBR of less than 1 indicates an undervalued stock, while a PBR of more than 3 indicates an overvaluation. Rodriguez-Fernandez (2015), Lin and al.(2018).

$$PBR = \frac{Market \ value \ of \ the \ stock}{Book \ value \ of \ the \ stock}$$
(3)

3.3. The control variables

To ensure unbiased results we introduced the following control variables: sector, number of years listed, total assets, share capital, we also include the effect of the Cop 22 global event held in Morocco in 2016.

3.3.1. Firm size

In order to control for the effect of the size of the firms that compose a sample, the control variable size is considered the most important (Anderson and Dejoy, 2011), and the most used (Griffin and Mahon, 1997).

3.3.2. Sector

In order to aggregate our sample, we divided it into three main sectors, namely: Industry, Service and Construction sector.

3.3.3. Age

The number of years is retained (Maqbool and Zameer, 2017; Masoud and Halaseh, 2017; Lin and al., 2018), since the listing imposes on the company to fulfill certain obligations in accounting and administrative normality something that provides market value to the company.

3.3.4. Cop22 event

The organization of the Conference of the Parties in its 22nd (COP22) edition in Morocco in 2016 has raised awareness among Moroccan

companies of the importance of integrating social and environmental criteria in their investments. COP is a dichotomous variable that takes the value "0" before 2016, i.e. before the organization of the event and the value "1" after 2016.

From the above, we have a main hypothesis that will be divided into subhypotheses depending on the degree of engagement of companies in CSR and the level of financial performance targeted.

The different hypotheses of our research are presented in the following table:

Reference	Hypotheses
Н	SRI has a + impact on the FP of companies.
H.1	Very Engaged SRI has a + impact on the FP of companies.
H.1.1	Very Engaged SRI has a + impact on the ROE of companies.
H.1.2	Very Engaged SRI has a + impact on the payout of companies.
H.1.3	Very Engaged SRI has a + impact on companies' PBR.
Н.2	Engaged SRI has a + impact on the FP of companies.
H.2.1	Engaged SRI has a + impact on companies ROE.
H.2.2	Engaged SRI has a + impact on the payout of companies.
H.2.3	Engaged SRI has a + impact on companies PBR.

|--|

Source: Elaborated by the authors

From the above, we find ourselves in front of a conceptual model schematized on figure 1.



Figure1 : Presentation of the conceptual model

Source: Elaborated by the authors

This work concerns the study of 48 Investments listed on the Casablanca Stock Exchange. All companies not listed on the stock exchange are excluded. The availability and quality of information published in financial reports is one of the main reasons behind that choice.

The period covered by this study is between 2011 and 2019. The choice of this period is random but justified by two events main reasons: that have directly impacted the international economy namely the financial crisis of 2008, and the pandemic of Covid 2019. The total number of observations obtained is 432.

All the data used in this work are collected directly from the official websites of the Casablanca Stock Exchange⁴ and the AMCC⁵ as well as the financial reports of the different companies that compose our sample⁶,

⁴ http://www.casablanca-bourse.com/bourseweb/index.aspx

⁵ http://www.ammc.ma Moroccan Capital Market Authority

⁶ Websites of different companies that compose our sample

the last are considered as a reliable and unavoidable source of secondary data (Fraser and al., 2006). So for the SRI variable, is obtained after combining between companies labeled CSR by the CGEM⁷ and Vigeo-Eiris⁸ reports published between 2011 and 2019.

The adopted models are summarized by the following equations:

$$ROE = \alpha + ISR + Sector + Size(LogCapital) + Age + Cop22$$
(04)

$$Payout = \alpha + ISR + Sector + Size(LogTActif) + Age + Cop22$$
(05)

$$PBR = \alpha + ISR + Sector + Size(LogTActif) + Age + Cop22$$
(06)

The same method of estimation for the three models is specified bellow: the resulting F-statistic is used to determine whether there are individual effects or not. If there are individual effects, a specification test is needed to define the type of individual effects and if it is a fixed or random effect, the test used is the Hausman test. To ensure that the models are well specified, and to avoid estimation bias, specification and goodness-of-fit tests have been adopted, namely: Ramsey rest test, homoscedasticity test and autocorrelation test.

4. Empirical Results

4.1. Exploratory analysis of the data

Before proceeding to estimate our models, we launched this section by describing, exploring and interrogating the statistical data in the analysis focuses on all of variables, starting with the explanatory variable, passing through the explained variables and finally the control variables.

From the figure 2, the number of labeled companies is unstable, especially after excluding any company that did not maintain its label during the study period in order to better identify the effect of socially responsible investment on the financial performance of Moroccan listed companies.

The maximum number of listed companies labeled CSR between 2011 and 2019 is reached in 2017 with 7 companies, to stabilize in 6 companies

⁷ http://rse.cgem.ma Confédération Générale des Entreprises du Maroc

⁸ https://vigeo-eiris.com/

until 2019. For the Vigeo-Eiris award, the first report published was in 2011, the report named 08 companies as Top CSR performers in Morocco in 2011. Another 05 reports were published until 2019 naming a total of 87 companies as top performers in terms of responsibility. The highest number was recorded in 2018 with 14 companies or 30% of the companies in our sample in 2018.





Source: Elaborated by the authors

For the dependent variables the annual evolution is analyzed on the basis of the variation of the means from one year to the next. In the table2, outlined the descriptive statistics that relate to the different dependent variables of our models.

Variable	Ν	Mean	Std. Dev.	Min	Max	Skewness	Kurtosi s
ROE	432	0,46	0,08	0,37	0,62	0,50	2,31
PBR	432	1,42	0,21	1,17	1,85	0,82	2,98
Payout	432	0,41	0,11	0,15	0,53	-1,42	4,77

Table2: Statistic descriptive of profitability Variables

Source: Elaborated by the authors

The ROE achieves a positive return of 46% (SD: ± 0.08), which concerns the funds available to the shareholders. The ROE range between the minimum value of 0.37 and maximum of 0.62. This means that the portfolio returns are less dispersed. The distribution of ROE is skewed to the right as the Skewness value is 0.50. However, the distribution of ROE is crushed since the kurtosis of 2.31 (less than 3).

PBR variable, range between 1.17 and 1.85 with a positive mean 1.42 (SD: ± 0.21), The investors are ready to pay 42% more for a stock than its book value, so the market value of the stock is more than its book value. The distribution of PBR is asymmetrical towards the right given that the value of Skewness is 0.82 (higher than 0). However the distribution is qualified as normal since the Kurtosis registers a value of 2.98. The distribution rate range between a minimum value of 1.17 and maximum of 1.85 the distribution rate the average recorded of is 41% (SD: ± 0.11) revealing that the company has recorded an average capital gain between 2011 and 2019. In order to evaluate the dependence between our variables two by two, a calculation of the correlation coefficient must be conducted to determine the absence or presence of a significant linear relationship between -1 and 1. The closer the coefficient is to 1 or -1, we speak of a multicollinearity between the two variables selected (Gujarati, 2009).

	Sector	ROE	PBR	Payout	Capital	T.Assets	listing
Secteur	1,0000						
ROE	-0,0382	1,0000					
PBR	-0,1062	-0,0616	1,0000				
Payout	0,1261	0,1052	-0,0759	1,0000			
Capital	-0,1175	0,3463	-0,0119	0,0626	1,0000		
T.Assets	0,1087	0,4007	-0,1973	0,0912	0,8062	1,0000	
Listing	-0,0825	0,1434	-0,1000	0,0917	0,2950	0,2780	1,0000

Table3: Correlation matrix

Source: Elaborated by the authors

From the table3, the variables are correlated either positively or negatively. The coefficients range from -0.1175 to 0.8062.Generally, the

correlation coefficients do not show an apparent collinearity problem because the values of most coefficients are far from -1 and 1.

4.2. Econometric modeling

After the exploratory analysis, econometric modeling is conducted. The approach followed starts with the regression of the different panel models selected.

For each of three models the same estimation method has been used, starting with the presentation of the main results of the regressions of the three fixed effects models which specify the relationship between SRI and ROE (model 1), PBR (model 2) and the payout ratio (model 3), followed by the different specification and adjustment tests and ending with the interpretation of the results of the adjusted models.

4.2.1. Robustness check

4.2.1.1. Detection of individual effects

The table4 summarizes the set of results concerning the regression of the fixed effect model for the three variables.

Variables	ROE	PBR	Payout
ISR			
Engaged	0.114 (0.130)	-0.0880 (0.049)*	-0.327 (0.138) **
VeryEngaged	0.363 (0.139) ***	-0.0228 (0.052)	0.042 (0.149)
Cop .22	-0.015 (0.104)	-0.113 (0.020) ***	0.074 (0.110)
Size		-0.0174 (0.066)	-0.001 (0.162)
Constant	47.35 (40.62)	0.0240 (0.598)	80.57 (43.25)*
F / Wald chi2 (Mod)	2.72	10.25	3.63
Prob> F/ Prob> Chi ²	0.0295	0.0000	0.0064
Observations	432	423	432
R-squared	0.028	0.099	0.037
Nombre d'action	48	47	48
Robust standard errors i	n parentheses *** p<	<0.01, ** p<0.05, * p<	:0.1

Table4: Fixed effect model for the three variables

Source: Elaborated by the authors

From the results in the table4 the models are statically significant, with Plus-Values less than 5%. The null hypothesis of no individual effects is rejected concludes that there is individual effects.

4.2.1.2. Specification of the type of individual effect: fixed or random

To determine the nature of the individual effects within the models, a Hausman test is is required. It allows verifying if the model is identical for all the investments or if there are differences specific to each of them. To perform this specification test, a second estimation is necessary using a random effects model in order to compare the two Models and then choose the correct estimation.

The table5 reports the set of results for the random-effects model regression on our three variables.

Variables	ROE	PBR	PayOut							
ISR										
Engaged	0.0819 (0.123)	- 0.085 (0.048)*	-0.294 (0.128) **							
Very Engaged	0.123	- 0.028 (0.051)	-0.062 (0.127)							
Sector										
Industry	0.043 (0.280)	- 0.113 (0.291)	-0.029 (0.232)							
Services	0.027 (0.245)	- 0.171 (0.269)	0.213 (0.209)							
Cop22	-0.015 (0.104)	- 0.113 (0.020) ***	0.073 (0.110)							
Age	0.422 (0.317)	- 0.002 (0.005)	0.305 (0.274)							
Size	-0.478 (0.159) ***	- 0.002 (0.061)	0.017 (0.084)							
Constant	49.78 (40.56)	0.075 (0.603)	77.70 (42.88)*							
F / Wald Chi ² (Mod)	20.69	41.68	17.40							
Prob> F/ Prob> Chi ²	0.008	0.000	0.026							
Observations	432	423	432							
Numbre action	48	47	48							
Robust standard errors	in parentheses *** p<	<0.01, ** p<0.05, * p<0	Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1							

Table5: Random effect model for the three variables

Source: Elaborated by the authors

Based on the results shown in table5, all three models are statically significant with a significance level below 5% for the variables ROE, PBR

and Distribution rate. We conclude that necessity of conducting Hausman specification test.

4.2.1.3. Hausman test

4.2.1.3.1. presence of random effects

The summary of the results of the Hausman tests are plotted in the following table6.

Test Hausman FE vs RE							
Variables	Decision						
ROE	0.68	0.9536	Random Model				
PBR	1.46	0.8335	Random Model				
Pay Out	1.83	0.7674	Random Model				

Table6: Results of the Hausman tests	Fable6:	ausman te	f the l	ts
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Source: Elaborated by the authors

The table6 shows that all the plus-values of Hausman test conducted are higher than the significance level of 5%. As consequence, the null hypothesis is accepted, i.e. we confirm the presence of random effects.

4.2.1.3.2. presence of endogeneity

for the endogeneity test, we opted for the Hausman test which allows us to check if there is a difference between the instrumental variable estimator and the OLS estimator, thus verifying if there is endogeneity of the variables (if the two estimators are consistent, they are asymptotically equal).

4.2.1.4. Ramsey-reset test on the good global specification of the model

After the specification of the models a test of ramsey is necessary to verify if our models are well specified or not. The results of the Ramezy tests concerning our three models are summarized in the table7.

Test Ramsey-reset								
Variables	F (3, 420)	Prob>F	décision					
ROE	1,18	0,3155	Well Specified Model					
PBR	1,17	0,3193	Well Specified Model					
Pay Out	1, 35	0.3491	Well Specified Model					

Table7: Results of the Ramsey tests

Source: Elaborated by the authors

According to the results of the table7, the plus-values are above the 5% threshold for all variables, so the null hypothesis is accepted i.e. the models are well specified.

4.2.2. Adaptation and adjustment of the model

After specifying profitability models, the adjustment procedure will begin by testing for autocorrelation and homoscedasticity.

4.2.2.1. Autocorrelation test

In order to perform this test, by regressing, first the model, the residuals are detected and then the squares of the residuals on the explanatory variables are regressed a second time. Finally, an F-test is necessary to see if the coefficients are significant.

Much software allows performing this autocorrelation test. A test detecting the dependence of errors is performed by analyzing the residuals directly according to the model adopted. This is the case of the Stata software which allows, with the xtserial() command, to perform a Wooldridge test for autocorrelation of panel data.

Variablas -	Tes	t Wooldridge of a	utocorrélation
v ar lables	F	Prob> F	Decision
ROE	1,976	0,1664	No Autocorrelation
PBR	35,499	0,0000	Autocorrelation
Pay Out	0,178	0,6748	No Autocorrelation

 Table8: Test Wooldridge of autocorrelation.

Source: Elaborated by the authors

The table8 shows that the two models concerning the ROE and the distribution rate variables present surplus values higher than the 5% threshold, which allows us to reject the alternative hypothesis and to accept the null hypothesis of the absence of first-order autocorrelation.

Then there is the presence of autocorrelation for the third model, which concerns the PBR model with a surplus value below the significance level 1%. The alternative hypothesis is accepted and the null hypothesis of no first order autocorrelation is rejected.

4.2.2.2. *Homoscedasticity test*

After conducting the Hausman and Ramsey specification tests for the three profitability variables, a random-effects model was found. The Stata software offers a command that allows us to check directly the heteroscedasticity problem. It is the xtreghet() command which is a module for estimating heteroscedasticity in panel data regressions specifically when it is a random effects model. These two tests verify the following hypotheses:

H0: Panel Homoscedasticity.

H1: Panel Heteroscedasticity.

Test	RC	ЭE	PBR		Pay	Out
Lagrange Multipl	1.99e+05	P<0.01	8.00e+04	P<0.01	6.87e+04	P<0.01
Wald	9.88e+07	P<0.01	1.30e+07	P<0.01	4.03e+06	P<0.01
Decision	H1: Heterosce	lasticity H1:	Heteroscedas	sticity	H1: Heteros	scedasticity

Source: Elaborated by the authors

According to the table9, it can be seen that all the gains from the Breusch Pagan Lagrange Multiplier and Wald tests are below the 5% significance level, so the null hypothesis of homoscedasticity is rejected and the existence of the heteroscedasticity problem for all models is admitted. A correction and adjustment work is necessary.

The results of the various tests carried out show that the models suffer from an autocorrelation and heteroscedasticity problem which can lead to corrupted estimation.

As for the risk models, the Generalized Least Squares (GLS) method is used to correct these problems. The Stata16⁹ softwareallows the direct correction of problems related to autocorrelation and homoscedasticity through the xtgls() command. This command adapts to linear panel data models and more specifically to random effects models using generalized least squares. This command allows the optimization and adjustment of a model when it suffers from autocorrelation or heteroscedasticity between panels. After correction, the adjusted models are reported in table10

Table10: Model Adjustment Report

Cross-sectional time-series FGLS regression Coefficients: « Generalized Least Squares » Panels: Homoscedastic Correlation: No autocorrelation

Variables	ROE	PBR	Pay Out	
I.S.R				
Engaged	- 0.055 (0.121)	0.092 (0.104)	-0.218 (0.118) *	
VeryEngaged	0.300 (0.101)***	- 0.173 (0.083) **	-0.223 (0.098) **	
Secteur				
Industry	0.070 (0.125)	- 0.064 (0.098)	0.005 (0.113)	
Services	0.051 (0.109)	- 0.145 (0.089)	0.215 (0.101) **	
Cop.22	- 0.013 (0.139)	- 0.121 (0.060) **	0.073 (0.136)	
Age (Cotation)	0.424 (0.138)***	- 0.004 (0.002) **	0.294 (0.134) **	
Size (T. Actif)	- 0.461 (0.075)***	0.140 (0.056) **	0.059 (0.048)	
Constant	45.36 (54.09)	- 1.172 (0.504) **	74.94 (52.69)	
Wald Chi2 (Mod)	59.54	20.17	27.07	
Prob> Chi2	0.00	P 0.00	0.00	
Observations	432	432	432	
Nombre				
d'actions	48	47	48	
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				

Source: Elaborated by the authors

⁹ StataCorp. 2019. Stata Statistical Software: Release 16. College Station, TX: StataCorp LLC.

4.2.3. Interpretations of the results of the adjusted models

Heteroscedasticity and autocorrelation were well corrected. All three of the models are largely significant with a p-value below the 1% threshold.

4.2.3.1. Adjusted modeling of the SRI and ROE interaction

For the relationship between the variable SRI and the variable Return on Equity (ROE) it is found that there is a positive impact for the "Very Engaged" investments with a significant p-value of 0.003 below the 1% threshold. In fact, the «Veryengaged» investments having obtained the «bestperformers» trophy awarded by Vigeo-Eiris achieve a higher return on capital than the other investments by (0, 30). On the other hand, the link between ROE and CSR-labeled SRI is not significant, since the p-value is well above the 10% significance level.

The sector variables and the Cop 22 event are no longer significant and therefore does not impact the ROE variable since their p-values exceed the significance level. For size and age, they impact the ROE with a significance level below 1%.

Indeed, when size of the firm increases by one unit, ROE decreases by (0, 46). In other words, small investments achieve a higher return on capital than large ones. In addition, when age increases by one unit, ROE increases by (0,42), i.e. the oldest firms in the stock market outperform the youngest in terms of return on capital.

4.2.3.2. Adjusted modeling of the relationship between SRI and PBR

As far as the Price to Book Ratio (PBR) is concerned, it is negatively related to the "Very Engaged" modality of socially responsible investments with a p-value of (0,038) significant at the 5% threshold, whereas this relationship is not significant for Committed investments. In fact, the companies that received the "Top Performers" award from Vigeo-Eiris have a lower PBR than the other investments of (0,17). This means that the Very Engaged SRIs are undervalued compared to the other investments. This relationship is no longer significant for committed companies since the p-value is well above the 5% significance level. The same observation is made for the Sector variable with a p-value of (0,51) and (0,10) respectively for the industry and services sector, which is

above the 5% significance level. The variables Age and Cop 22 impact negatively PBR with a significance level below 5%. When the age of the investments increases by one unit, the PBR decreases by (0,05). On the other hand, the organization of the Cop 22 event in Morocco has a negative impact on the value of investments of (0,12) compared to the years before 2016. Finally, the size variable positively impacts the PBR with a significance level below 5%. Indeed, when the size of the investment increases by one unit, the valuation of the company increases by (0,14).

4.2.3.3. Adjusted model of the relation between SRI and payout ratio

The SRI variable negatively impacts the dividend payout ratio. For the "Engaged" SRIs, labeled by the CGEM CSR label, distributes to its shareholders in the form of dividends less than the other investments by (0,24), while the Very Engaged SRIs realize a payout ratio lower than (0,21) compared to the other investments, with a significant gain of (0,04) and (0,03) respectively for the Engaged and Very Engaged investments. For the services and age variables, dividends are positively impacted with a significance level below 5%. Indeed, firms belonging to the services sector distribute a higher percentage of profit in the form of dividends than other investments by (0,24). On the other hand, the oldest companies in the stock market are more profitable for the shareholders with a significance level of (0,02). When the age of the listed investment increases by one, the payout ratio also increases by (0,30). For the other variables, the results are not significant at the 5% level.

4.2.4. Summary of adjustment models

From the fit report it can be seen that the problem of heteroscedasticity and autocorrelation has been well corrected. The three models are largely significant with a p-value significant at the 1% level. The summary of the most important results of the assumptions and their interpretations are presented in the table11.

	Hypothesis	Impact	Interpretation
Н	SRI has a positive impact on the financial performance of companies.	Contradictory	Mixed results
H1	A Very Engaged SRI has a positive impact on the financial performance of companies.	Contradictory	Mixed results
H.1.1	A Very Engaged SRI has a positive impact on the ROE of companies.	+0,29	Confirmed
Н.1.2	A Very Engaged SRI has a positive impact on the payout ratio of companies.	-0,21	Rejected
Н.1.3	A Very Engaged SRI has a positive impact on companies' PBR.	-0,17	Rejected
Н.2	Engaged SRI has a positive impact on the financial performance of companies.	Négatif	Partially rejected.
H.2.1	Engaged SRI has a positive impact on companies' ROE.	Insignificant	Not validated
Н.2.2	Engaged SRI has a positive impact on the payout ratio of companies.	- 0,24	Rejected
Н.2.3	Engaged SRI has a positive impact on companies' PBR.	Insignificant	Not validated

Table11: Results of the assumptions

Source: Elaborated by the authors.

From the above we can summarize our adjusted profitability models in the following equations:

ROE = 45,36 + 0,29 V.Eng + 0,423 0,38 Age - 0,46 Size (07)

PBR = -1,17 - 0,17V.Eng + 0,05Age + 0,14Taille + 60,12 Cop22 (08)

Payout = 72,55 - 0,24Eng - 0,21V.Eng + 0,24Services + 0,31Age (09)

4.2.4.1. *Comparison of the results with the literature*

The hypothesis (H.1.1) which stipulates the positive impact of A Very Engaged SRI on ROE was confirmed (+0.29), several authors have confirmed the same positive relationship between SRI and ROE such as Vitezicand al (2012); Siewand al (2013); Dkhiliand al (2014); Jiang and Yang (2015); Maqbool and Zameer (2017). However, the other two hypotheses H.1.1.2, H.1.1.3 were negated.

The hypothesis (H.1.2) which stipulates the negative impact of A Very Engaged SRI on Payout was rejected (-0.21), this result is in line with the "neoliberal" theory of Milton Friedman (1962), as well as the theory of "financial costs" Luther and al. (1992). Several authors have reached the same results Gallo (2004); Allouche and Laroche, (2005); (He and al. 2012).

The hypothesis (H.1.3) which stipulates the negative impact of A Very Engaged SRI on PBR was rejected (-0.17), the work of Khlif and al. (2015) on South African and Moroccan shares, confirmed our results in the case of Moroccan shares, but they found a positive relationship for South African shares. Other authors managed to detect a neutral effect between PBR and SRI as Surroca and al. (2009); Tjia and Stiawati (2012).

The hypothesis (H.2.2) which stipulates the negative impact of A Very Engaged SRI on Payout was rejected (-0.24), several authors have reached the same results Gallo (2004); Allouche and Laroche, (2005); (He and al. 2012).

5. Discussion

According to the table above, 03 of the hypotheses refer to a negative impact between SRI and financial performance, and they were subsequently rejected. On the other hand, hypothesis H.1.1 was confirmed as it refers to a positive effect of SRI on financial performance. The ascending hierarchy of the results of the hypotheses leads to mixed results regarding the main hypothesis H.

5.1. Hypothesis (H.1): The impact of A Very Engaged SRI on firms' financial performance

The profitability of the firm is measured by three variables, namely ROE (H.1.1), Payout Ratio (H.1.2) and PBR (H.1.3).

Only the hypothesis (H.1.1) which stipulates the positive impact of A Very Engaged SRI on ROE was confirmed (+0.29) in other words, the nomination of the companies by the Vigeo-Eiris Top Performer trophy has borne fruit, insofar as it reflects a good management capacity on the part of the managers, and subsequently allowed the investments to realize a net profit on the invested capital stock. The reputation and image of a socially responsible investment conferred by the Top-Performer award

reflects a certain control of market risks as well as the quality and efficiency of the investments made.

For the Payout Ratio, the nomination of Vigeo-Eiris "Best in Class", has a negative impact on the dividend payout. This can be explained by the additional costs of taking social or environmental constraints into account in the internal management of the company, which leads to a detour of part of the profits to the social cause, and subsequently can be interpreted as a negative impact on the financial performance of the company Rudd (1981). This can create a certain aversion to this type of investment among shareholders.

For the Price to book Ratio, a "Top Performers" SRI can be poorly viewed by the stakeholders of the Moroccan company, especially speculators since its purchase price does not reflect its true value on the market. This underperformance is explained by instrumental theories that limit the role of the company to the simple mission of wealth creation. For David Friedman, the reason why a company exists is to make a profit (Friedman, 1970). This is why the more socially active the company is, the more its value deteriorates on the financial level (arbitrage theory). The costs generated by the social vocation put the company at a competitive disadvantage (Jensen, 2002). On the other hand, the financial underperformance obtained by the PBR, can be justified by the existence of a classic investment more efficient at the financial level, and achieves a higher gain "Theory of managerial opportunism".

5.2. Hypothesis (H.2): The impact of Engaged SRI on firms' financial performance

For Engaged SRI, Hypothesis (H.2) is partially rejected, since the 02 subhypotheses H.2.1 and H.2.3 are insignificant while Hypothesis (H.2.2) that measures the relation between Engaged SRI and the Payout Ratio of firms is rejected.

Indeed, the CGEM CSR labeling negatively influences the dividend payment rate granted to shareholders, with a small difference noticed between the CSR labeled SRIs and those named Top Performer (-0.24 vs. -0.21). This result may create a certain aversion to this type of investment among shareholders.

6. Conclusion

The objective of this study is to define the impact of SRI on profitability. The contradictory results obtained show the existence of a mixed relationship between SRI and financial performance. Indeed, our study reveals that we can observe varying investment performances, depending on the level of involvement in social responsibility. In other words, certain investment selection and management choices made by managers can lead to different financial performances (investment diversification, commitment to a CSR labeling procedure or not). On another note, the types of SRI defined in our study (very Engaged and Engaged, Not Engaged) allow managers to clearly define the relationship between social responsibility and financial performance and subsequently optimize and adapt their investment selection choices.

Moreover, measuring the impact of SRI on profitability, operationalized by variables such as ROE, PBR and payout ratio, can help managers better understand the intentions of the company's various stakeholders. Indeed, ROE allows to highlight the behavior of managers interested in the return on equity, the distribution rate targeted by shareholders who expect the distribution of dividends, and finally the PBR which is of great interest to speculators by allowing them to compare the book value of the company's assets with its stock market price in order to identify undervalued companies.

Also, by engaging in a socially responsible approach, our results allow the manager to clearly define the expectations of stakeholders and to make corrections in the management strategy adopted.

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Assessing the Impact of Nontariff Measures on Imports and Overall Protection in OIC

Bushra Faizi¹ and Nasim Shah Shirazi²

ABSTRACT

The paper discusses the decline in tariffs and the increasing use of nontariff measures (NTMs) in countries constituting the Organization of Islamic Cooperation (OIC). The paper calculates frequency ratios (number of imports subject to NTMs), coverage ratios (Import value subject to NTMs), tariff equivalent (AVEs) of NTMs, and overall protection (protection provided by tariff and AVEs) for the years 1997 to 2015. The analysis shows that the usage of NTMs has increased in recent decades. More than 50 percent of trade in most countries was subject to NTMs as of 2015. The AVEs of NTMs and overall protection have increased with a significant decline in simple average effectively applied tariff. As a result, NTMs evolved into a dominant source of overall protection. The protection given by AVEs has increased from 35 percent in 1997 to 71 percent in 2015. The paper recommends the OIC members to review and simplify the use of NTMs and harmonize with trading partners.

ملخص

تناقش الورقة البحثية انخفاض الرسوم الجمركية وزيادة استخدام التدابير غير الجمركية (NTMs) في البلدان التي تشكل أعضاء منظمة التعاون الإسلامي (OIC). وتحسب نسب التواتر (عدد الواردات الخاضعة للتدابير غير التعريفية)، ونسب التغطية (قيمة الاستيراد الخاضعة للتدابير غير التعريفية)، ومعادل التعريفة (AVEs) للتدابير غير التعريفية، والحماية الشاملة (الحماية التي توفرها التعريفية الجمركية ومعادل التعريفة) للأعوام ما بين 1997 و 2015. ويُظهر التحليل أن استخدام التدابير غير التعريفية قد ازداد في العقود الأخيرة. وأكثر من 50 في المائة من التجارة في معظم البلدان خضعت للتدابير غير التعريفية اعتبارا من عام 2015. وإزدادت الحدود الدنيا للقيمة المضافة للتدابير غير

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Assessing the Impact of Nontariff Measures on Imports and **Overall Protection in OIC**

التعريفية والحماية الشاملة مع انخفاض كبير في متوسط الرسوم الجمركية المطبقة بفاعلية. ونتيجة لذلك، تطورت التدابير غير التعريفية لتصبح مصدرا مهيمنا للحماية الشاملة. وزادت الحماية التي يمنحها معادل التعريفات من 35 بالمائة المسجلة عام 1997 إلى 71 بالمائة في 2015. وتوصى الورقة البحثية أعضاء منظمة التعاون الإسلامي بمراجعة وتبسيط استخدام التدابير غير التعريفية والتنسيق مع الشركاء التجاريين.

ABSTRAITE

Ce document porte sur le déclin des tarifs douaniers et l'utilisation croissante des mesures non tarifaires (MNT) dans les pays constituant l'Organisation de la coopération islamique (OCI). Le document calcule les ratios de fréquence (nombre d'importations soumises aux MNT), les ratios de couverture (valeur des importations soumises aux MNT), les équivalents tarifaires (EAV) des MNT et la protection globale (protection fournie par le tarif et les EAV) pour les années 1997 à 2015. L'analyse montre que l'utilisation des MNT a augmenté au cours des dernières décennies. Plus de 50 % du commerce dans la plupart des pays était soumis à des MNT en 2015. Les EAV des MNT et la protection globale ont augmenté avec une baisse significative du tarif moyen simple effectivement appliqué. Par conséquent, les MNT ont évolué pour devenir une source dominante de protection globale. La protection accordée par les EAV est passée de 35 % en 1997 à 71 % en 2015. Le document recommande aux membres de l'OCI de revoir et de simplifier l'utilisation des MNT et de les harmoniser avec les partenaires commerciaux.

1. Introduction

Tariffs have declined globally over the last decades due to bilateral and multilateral negotiations and successive rounds of the World Trade Organization (WTO). According to World Bank data, the global average tariff declined from 15.58 percent in 1994 to 5.17 percent in 2017. However, the term trade protection is often understated by defining it in terms of tariffs only. Apart from the tariffs, the nontariff measures (NTMs) have substantially increased during the last decade. The number of product lines subject to at least one category of NTMs has increased from 1456 to 2852 from 1997 to 2015.³

⁵⁸

³ UNCTAD-TRAINS

NTMs are defined as "Policy measures other than ordinary customs tariffs that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices or both." (UNCTAD, 2019). These include a broad range of policy instruments such as quota, price control, monopolistic measures, etc. However, the most popular and widely applied measures are sanitary and phytosanitary measures (SPS) and technical trade barriers (TBT).

NTMs have complex taxonomy, making it difficult to measure and monitor them. MAST classifies NTMs into 16 main chapters, divided into 90 sub-chapters, including import and export-related measures.⁴ Out of 16 groups, 15 groups are related to imports. Each sub-chapter is further decomposed into sub-measures. According to this classification, there are 358 measures with a unique NTM code.⁵ In this paper, we focus on NTMs imposed on imports. These measures are related to food safety measures, labeling requirements, pre-shipment inspection, licensing, quotas and other control measures, taxes other than custom tariffs, and anticompetitive measures.

NTMs are meant to achieve non-trade objectives, including human health, animal welfare, and environmental concerns. However, they can have a potential protectionist impact. Unlike tariffs, NTMs are not tractable and not easy to quantify and monitor. Similarly, the relationship between NTMs, trade, and welfare is not straightforward. Many NTMs can impede trade by hindering market access, raising trade costs, and lowering exports, but at the same time can be traded facilitating by correcting market failures.

With the global reduction in tariffs, NTM became a more prominent policy tool. NTMs significantly contribute to the trade costs in developing countries (World Bank and UNCTAD,2018). NTMs are initially not imposed for protectionism intent; however, they impose fixed and variable costs and may drive exporters out of the market. Developing countries are constrained by the financial and technical capacity to bear such costs. Moreover, the discriminatory treatment (imposing more

⁴ United Nation Conference on Trade and Development (UNCTAD) established Multi Agency Support Team (MAST) to work on taxonomy of NTMs in 2006 and the NTM classification is provide by MAST

⁵ The international classification of NTMs prepared by UNCTAD can be assessed at: <u>https://unctad.org/system/files/official-document/ditctab2019d5_en.pdf</u>

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NTMs for certain trading partners) also leads to protectionism (Shepotylo,2016). NTMs become nontariff barriers (NTBs) by increasing trade costs and impeding trade. Such costs include production costs, transportation costs, and transaction costs. Studies conclude that harmonization with trading partners can lead to export diversification by reducing the cost burden of exporters (Shepherd,2015). Implicit costs associated with NTMs include transparency and information cost and can impede trade. For example, lack of transparency in the administrative process, complex documentation, and outdated custom procedures may lead to transaction costs, such costs associated with NTM merely to market losses and welfare losses in general.

1.1 Problem Statement and Objective of the Study

Despite the substantial decline in tariffs, trade costs and trade protection are rising due to the increasing usage of the NTMs. In developing countries, NTMs significantly contribute to trade costs (UNCTAD-WB 2018), contribute significantly to trade protection (Niu et al., 2018), and play a role in invisible trade barriers.⁶ With the proliferation of NTMs and the decline in tariffs, the critical question is, do NTMs have a price-raising effect, and how much does it contribute to the protection compared to the tariffs.

Furthermore, the majority of the OIC member countries are developing, and studies reveal that developing countries tend to have more protective policies than developed countries (Niu et al., 2018; Kee et al., 2009). On the other hand, the OIC economic outlook reports that the decline in trade costs among OIC members was insignificant compared to the rest of the world. On average, OIC countries' trade costs decreased by 9% compared to a 20% cost reduction in the developed world from 1995 to 2010 (OIC outlook report, 2014). Moreover, numerous studies discuss NTMs in OECD countries. However, there is a dearth of literature examining all the NTMs in OIC countries in general and calculating AVEs. Hence, the paper in hand fills these gaps in the literature.

Therefore the main objective is to measure the price-raising effect of NTMs in the form of AVEs and compare the protection given by NTMs

⁶ NTMs is a neutral concept and all NTMs are not necessarily non-tariff barriers (NTBs)

and by tariffs over the years in OIC member countries. We will examine the prevalence of the core NTMs in OIC members across the sectors, calculate the AVEs of NTMs, and measure the protection by combining the tariffs and AVEs of NTMs. We will calculate the AVES for different product groups using product-level AVEs from Niu et al. (2018) and discuss the evolution of NTMs, tariffs, and overall protection in some OIC members. We also find the most protected sector with NTMs than Tariffs. The rest of the paper is organized as follows. Section 2 provides the literature review. Then, section 3 gives the methodology and the data used, while section 4 discusses the results. Finally, section 5 concludes the paper.

2. Literature Review

The proliferation of NTMs as a trade policy tool after the 2008 financial crisis stimulated the discussion on NTMs among researchers. The increasing use of NTMs as a protectionist tool may preclude the economic benefit of trade liberalization in the form of a declining tariff. The existing literature on Nontariff measures mainly focuses on two broad areas: the effect of NTMs on trade and the substitutability between tariffs and NTMs.

A strand of literature quantifies the NTMs by calculating the tariff equivalent of NTMs using different methodologies. Kee et al.'s (2009) pioneering work calculates the AVEs of NTBs using import values normalized to unity.⁷ They measure the trade restrictiveness index using NTBs and Tariff and find that NTBs contribute more than a tariff in restricting trade. Moreover, they find that tariffs and NTBs are substitutes after controlling for product and country fixed effects. They also found that the effect of NTBs on imports in the agriculture sector was greater than in the manufacturing sector. They use data for 2002 and do not comment on the evolution of NTBs. Niu et al. (2018) adopted the methodology of Kee et al. (2009) and extended the discussion using discrete data from the years 1997 to 2015 for 97 countries. They comment that NTMs evolved as a more dominant protectionist policy tool than the tariff, as average AVEs and overall protection increased over time with the decline in average tariff. They report that NTMs contribute more than

⁷ Kee et al. (2009) imposed parameter restrictions and restricts NTMs to be NTBs.

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a tariff in overall protection and low-income countries have higher AVEs than high-income countries.

The non-constained empirical studies suggests that NTMs have a mixed effect on trade. NTMs have both positive and negative effects, depending on the country, product, and type of NTMs. Trade-enhancing effects include quality insurance, environmental safety, consumer protection, reducing information asymmetry, and increasing consumers' confidence in imported products. On the other hand, the trade restricting effect includes discouraging trade by increasing the trade costs and imported prices. A recent study by (Hai Luu & Parsons, 2022) shows that the adverse effect of technical measures of the importers' on the exports of Vietnam overshadows the demand enancing effect. Kee et al. (2009) and Niu et al. (2018) restrict the parameters to be non-positive, forcing the NTMs to have trade-reducing effects (NTBs). Beghin et al.(2015) address this limitation and re-estimate the model proposed by Kee et al. (2009), and relax the restriction to estimate the trade restiveness index in the presence of market imperfection (allowing for both positive and negative effects). They use the data on technical regulations for the years 2001 to 2003. The results show that out of the 12 percent of product lines affected by technical regulations, 39 percent indicate the facilitating trade effect of NTMs. A study by Peci & Sanjuán (2020) aslo find the dual effect of NTMs, based on AVEs. They study the pork trade in china conclude that AVEs are not symetrical.

The above studies do not include the regulatory environment in the analysis. Cadot et al. (2018) estimate the trade effects of NTMs on trade volume and trade value captured in AVEs, considering the regulatory distance. They separately evaluate the price effect and volume effect and assert that price-based effect can facilitate trade, but at the same point, they recognize that the trade cost of NTMs often reduces trade volume. The price-based estimation result shows that NTMs reduce information asymmetries and enhance consumers' confidence in imported products. On the other hand, the volume-based estimates show that trade costs from NTMs often reduce trade volume, except in sanitary and phytosanitary areas requiring a close regulatory environment. One of their important conclusions is that the regulatory differences are the key contributor to NTM-related trade costs.⁸

⁸ See Cadot et al. (2018) Annex 6; P.29 for methodology of measuring regulatory distance.

The studies discussed above do not differentiate the type of NTMs and do not consider the number of NTMs; instead, they largely use a dummy variable for the presence or absence of NTMs. For example, a product could be subject to TBT, price control, and Quantity control at the same time. Grübler et al. (2016) calculates the AVEs of NTMs for 103 WTO member states from 2002 to 2011 and distinguishes the type of NTMs and the number of NTMs across countries and products. They found that NTMs can distort or increase trade depending on the reporter and product under discussion. They compare the use of NTMs by income group and conclude that although the use of NTMs was higher in developed countries than in emerging countries, the effect of NTMs was more negligible in more affluent countries in the form of decreasing AVEs.

Researchers discuss that developed countries are usually the standard settler, and developing countries bear the cost of complying with them due to the constraints such as capital and infrastructure. Moreover, the NTMs imposed by developing countries and their trading partners are more restrictive (Bratt,2017; Devadason et al., 2018). Also, stricker imports are trade restrictive (Fiankor et al., 2021). Bratt (2017) calculates bilateral AVEs following the methodology developed by Kee et al. (2009) for 81 countries (6480 exporter–importer pairs) at the HS 6-digit level using data from the year 2003 to 2016. Results show that low-income importers impose fewer NTMs in relative terms compared to high-income and upper-middle-income importers, yet the more restrictive ones. Furthermore, the impact of NTMs was seen to decline with income. The impact of NTMs on trade was both positive and negative, but most of the trade facilitating NTMs were statistically insignificant.

Other studies discuss NTMs without calculating the AVEs of NTMs. Liu et al. (2019) examine the impact of NTMs on agriculture exports. They compare the real export value in the presence of NTMs and predicted export value in the absence of NTMs to see the effect of NTMs on exports. They conclude that the actual exports were far less than the predicted values. Hu and He (2020) discuss that the export deflation effect of exporter market expansion occurs given the low incidence of NTM in the new export market. It means that deflation tends to be less costly if the incidence of NTM in the new potential market is low. This implies that NTM are likely to impede exporters from entering a new market.

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Baghdadi et al. (2019) investigate the impact of NTMs on Tunisian imports for the years 2000 to 2009 using firm's level data. The study finds that large and medium firms (importers) from non-EU partners that comply with NTMs (Pre-Shipment inspection and technical barrier to trade) seem to increase their market shares. However, the analysis is based on the notion that small firms are less efficient, and NTMs can push less efficient firms to exit the market. The firms having the capacity to stay will benefit from the information content of NTMs. Assuming that such impact is stronger in the case of distant partners, the study uses non-EU partners.

Orifice (2017) discusses the relationship between the tariff reduction by importers and the probability of raising NTM (technical barriers and sanitary and phytosanitary) concerns by exporters. They report a significant negative correlation between the Specific Trade Concern (STC) and effectively applied tariff, meaning that the STC raised by exporters increases with the reduction in tariff. They argue that when tariffs decline, nontariff measures become more barriers to trade with a protectionist effect, and this causes the increase in STC by exporters.

NTMs may have purely protectionist intentions as countries substitute NTMs for declining tariffs. Many studies investigate the substitutability between tariffs and NTMs. Kee et al. (2009) estimate AVEs of NTBs. They explored the relationship between tariffs and estimated AVEs and suggested a policy substitution. However, in the analysis, the parameters were constrained to be non-positive, suggesting a negative effect. Based on the methodology of Kee et al. (2009), other studies confirmed the substitution between tariffs and NTMs (Limso and Tovar 2011; Ronen & Ronen 2017). Ronen and Ronen (2017) prove that the two policy instruments are substitutes for developing countries while complementing each other in high-income countries. Furthermore, they show that substitutivity tends to decrease with an increase in economic development. Niu et al. (2020) established the policy substitution using AVEs of core NTMs and tariffs for panel data covering 80 countries, including OIC, from 2003 to 2015. Other studies use proxy measures to establish the tariff and NTM relationship, which is not directly comparable to tariff (Beverelli et al., 2019; Beverelli et al., 2014; Tudelamarco et al., 2014). The latest studies largely agree that NTMs and tariffs are substitutes.
2.1 Conclusion of the Discussion in the Literature

To conclude the literature, NTMs have increased globally with the decline in tariffs. The contribution of NTMs to trade protection is more significant compared to tariffs. The price-raising effect of NTMs calculated as AVEs is higher in developing countries. Developing countries have relatively more restrictive regimes. The literature has almost focused on OECD countries and Western economies. Although there has been discussion on NTMs among OIC members, it's limited regarding types of NTMs, data, sectors, and countries. Our paper fills the gap in the literature. First, it calculates the prevalence score of core NTMs in some of the OIC members. It calculates AVEs for individual product groups in the agriculture and manufacturing sectors to see the evolution of NTMs in the form of AVEs. Finally, the paper measures the overall protection given tariffs and NTMs from 1997 to 2015 with three years intervals.

3. Methodology

The techniques to quantify nontariff measures include simple inventory measures (frequency counts and coverage ratio), price gap model, gravity model, partial equilibrium analysis, and computable general equilibrium model. This paper relies on the simple inventory measures to see the pervasiveness of NTMs. To calculates the AVEs, we use the product level AVEs already available, and combines tariffs and AVEs to see overall protection. The information on the NTMs has not been improved since 2015, to save time, we rely on the product-level AVEs estimates calculated by Niu et al. (2018).

The AVEs are estimated at the product level using import values evaluated at exogeneous world prices, which are normalized to unity. This makes import quantities equal to import value.⁹ Thus, the estimated AVEs are the price effect of NTMs on imports and are comparable to tariffs. The paper calculates frequency indices, coverage ratios, AVEs for different product groups, and overall protection by combining the tariff data and AVEs data.

⁹ See Niu et al. (2018) for the methodology used to compute AVEs of NTMs.

The frequency ratio is defined as the percentage of the number of imported products in the group affected by at least one category of core NTMs being considered.

Following Nicita and Gourdon (2013), the frequency index of NTMs imposed by country j is calculated using the following equation:

$$F_{ijk} = \left[\frac{\sum D_{ijk}M_{ij}}{\sum M_{ij}}\right] * 100$$
(1)

where F_{ijk} is the frequency index for a group of products, i, in country j for a particular category of the core NTMs, k; M_{ij} is a dummy variable that indicates whether there are imports of those products, i, into country j, and D_{ijk} is a dummy variable reflecting the presence of at least one of the core NTMs in the category being considered, k, for the product group, i in country j. The measured frequency lies between 0 and 1, and the greater the value, the higher frequency of core NTMs; in this paper, we represent the frequency index as lying between 0 and 100 percent.

The importance of NTMs on overall imports is measured using the coverage ratio. The coverage ratio is defined as the share of the value of imports subject to at least one category of core NTMs being considered for a country, with a higher value indicating greater coverage by core NTMs.

The coverage ratio formula, also adopted from Nicita and Gourdon (2013), is given as:

$$C_{ijk} = \left[\frac{\sum D_{ijk} V_{ij}}{\sum V_{ij}}\right] * 100$$
 (2)

where C_{ijk} is the coverage ratio for a group of products, i, for a particular category of the core NTMs, k, in country j; V_{ij} is the import value of these products i in country j, and D_{ijk} is a dummy variable reflecting the presence or absence of at least one category of the core NTMs in the category being considered, k, for the product group, i, in country j.

The frequency ratio and coverage ratio use a dummy variable for the presence and absence of certain NTM for the specific product and do not account for several measures applied on the same product.

As mentioned earlier, we are using the information on AVEs at the product level calculated by Niu et al. (2018) to measure the AVEs across the sectors.

Finally, the overall protection is calculated by combining tariffs and AVEs, using the formula given as:

$$T_{\rm nc} = t_{\rm nc} + Ave_{\rm nc} \tag{3}$$

Where the overall protection T_{nc} , is the sum of tariffs imposed by country c on product n, t_{nc} And AVEs of NTMs imposed by country c on product n, Ave_{nc}.

3.1 Data

The import data is taken from UN COMTRADE. The NTM data is taken from UNCTAD's TRAINS. The data on effectively applied tariffs are taken from the WITS database at 6-digit product aggregation.¹⁰ The estimated AVEs from 1997 to 2015 are extracted from Niu et al. (2018).¹¹

The NTMs considered in the estimation of AVEs are the core NTMs namely: Quantity Restrictions (TRAINS M3 code A1, B1, E1-E3, G33), technical measures (TRAINS M3 code A, B, C), Price control measures (TRAINS M3 code F1-F3), and Monopolistic measures (TRAINS M3 code H). Like the inventory measures, a dummy variable represents the NTM measure in estimating AVEs. i.e., the core NTM takes the value 1 if one of the mentioned measures is in place and zero otherwise.

Due to the data restrictions, we could not include all the OIC members in the discussion. The countries included in the analysis are provided in the endnote.

4. Results and Discussion

The analysis includes two parts: In first part we discuss the pervasiveness of NTMs. In the second part we calculate sectoral AVEs, and later overall protection.

¹⁰ Effectively applied tariff is the lowest available tariff between preferential and MFN

¹¹ The data is available at <u>https://www.nottingham.ac.uk/gep/links/index.aspx</u>

4.1 Descriptive Statistics

Table 1 reports the coverage ratio and frequency index of 31 OIC members. Looking at the coverage ratio, in 19 OIC members, more than 50 percent of trade is affected by NTMs as of 2015. For some countries, the statistics are given for 2016. Nigeria has the highest coverage ratio, followed by Saudi Arabia and UAE. With a few exceptions, the coverage ratio is greater than the frequency index in most OIC members, suggesting a high impact of NTMs.

	ISO3	Reporter	Coverage Ratio	Frequency Index
1	NER	Nigeria	94.33	85.9
2	SAU	Saudi Arabia	75.45	70.28
3	ARE	United Arab Emirates	73.06	60.19
4	TUN	Tunisia	70.63	58.17
5	IDN	Indonesia	68.95	56.33
6	QAT	Qatar	67.94	60.36
7	BEN	Benin	64.11	32.73
8	KGZ	Kyrgyzstan	62.81	55.4
9	BFA	Burkina Faso	61.76	26.46
10	GMB	The Gambia	61.25	14.75
11	TUR	Turkey	60.74	67.62
12	BHR	Bahrain	58.6	48.13
13	LBN	Lebanon	57.28	26.37
14	MAR	Morocco	57.25	44.55
15	TJK	Tajikistan	55.76	34.69
16	MYS	Malaysia	54.96	36.6
17	OMN	Oman	54.78	53.27
18	DZA	Algeria	52.9	53.17
19	GUY	Guyana	52.53	71.83
20	SEN	Senegal	48.3	28.77
21	CMR	Cameroon	46.8	18.71
22	BRN	Brunei Darussalam	44.47	25.18
23	KWT	Kuwait	41.37	23.56
24	MRT	Mauritania	36.58	17.93
25	PAK	Pakistan	33.12	15.24

Table.1: Frequency index and coverage ratio of OIC countrie	s 2015-2016*
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26	JOR	Jordan	31.25	17.02
27	NGA	Niger	28.51	18.78
28	TGO	Togo	24	17
29	AFG	Afghanistan	22.74	13.3
30	CIV	Côte D'Ivoire	21.87	18.71
31	SUR	Suriname	12.27	14.18

Source: WITS and own calculation based on UNCTAD's TRAINS data

*The available statistics are taken from WITS to save time and resources. WITS report the frequency index and coverage ratio for 2015 and some countries in 2016. For some of the countries for which the statistics were not available, the FI and CR are calculated using data from UNCTAD's TRAINS. Note that WITS exclude the NTMs covering 95 percent of the products in the calculation.

Years	А	В	С	Е	F	Total
1997	3,627	8,065	104	2,760	0	14,556
1998	821	286	0	881	0	1,988
1999	1,855	1,922	22,978	68,064	0	94,819
2000	15,317	1,062	2,842	5,944	110	25,275
2001	378,177	2,577	28	994	0	381,776
2002	36,928	159	488	1,644	10	39,229
2003	9,548	6,640	985	1,293	0	18,466
2004	5,691	66,655	5,331	17,159	0	94,836
2005	27,059	47,524	16,584	6,540	5,876	103,583
2006	3,668	97,863	18,488	232,651	0	352,670
2007	9,432	21,471	22,824	2,388	0	56,115
2008	21,126	7,758	13,419	4,625	0	46,928
2009	9,757	9,210	3,111	1,353	6	23,437
2010	160,853	17,202	4,621	197,201	0	379,877
2011	1,028,522	155,461	236,174	129,178	0	1,549,335
2012	92,559	13,010	51,613	4,056	112	161,350
2013	114,920	155,156	450,107	230,031	0	950,214
2014	195,224	14,605	10,107	26,471	0	246,407
2015	87,070	53,856	22,185	48,088	0	211,199
Total	2,202,154	680,482	881,989	981,321	6,114	4,752,060

Table 2: Evolution of NTMs in OIC 1997-2015

Source: Author's calculation based on UNCTAD's TRAINS data

Table 2 reports the evolution of NTMs over time in 35 OIC members from 1997 to 2015.ⁱ The cumulative score shows the existing NTMs in a specific year and newly added NTMs each year. The data indicate that NTMs started increasing in 2001. The highest recorded is in 2011. The table covers A - Sanitary and phytosanitary measures. B - Technical barriers to trade, C - Pre-shipment inspection and other formalities, E-Non-automatic import licensing, quotas, prohibitions, quantity-control measures, and other restrictions other than SPS or TBT measures, and F -Price control measures, including additional taxes and charges. Sanitary and phytosanitary measures are mostly applied NTMs, followed by E. F is the least applied NTMs. Note that each category of core NTMs is further subdivisions, each chapter serving the same objectives.

From table 2, we see the NTMs in use in 2011 are the highest. This suggests that OIC members increased the usage of NTMs after the financial crisis of 2008 which is consistent with Niu et al. (2018). This situation is very similar to the data on NTMs in the pandemic. For example, UNCTAD data reports 303 additional NTMs imposed by countries between Jan 2020- Jan 2021, some of which were later terminated. Most of the measures were applied to basic food items, live animals, and Covid-related medical supplies. The data shows that the additional tariff and NTMs imposed on imports and exports amid the pandemic by developing countries are significantly higher compared to the developed world. The NTMs were imposed to restrict trade, and tariff measures were applied to facilitate trade.

In the second part of the analysis, we discuss the changes in tariffs over the years, the AVEs of NTMs, and the overall protection in terms of tariffs and NTMs.

4.2 Decline in tariff

The world has witnessed the global decline in tariffs since the Uruguay Round conclusion in 1994, especially in developing countries, including OIC members. The tariff data is plotted in figure 1.ⁱⁱ The discrete data is plotted with three-year gaps due to the non-availability of data each year. Data from the previous year is adopted for the countries for which tariff data was not available. The figure shows a clear downward trend in average tariff in OIC members from 2000 to 2015. The average tariffs are halved from 2000 to 2015.

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The tariff was less than 5 percent in Brunei, Turkey, Kuwait, and Kyrgyzstan in 2000. Among the 23 countries included, the tariff was highest in Morocco at 29 percent, followed by Tunisia at 28 percent, Egypt at 25 percent, and Algeria, Nigeria, Jordan, and Pakistan, all at 24 percent in 2000. However, tariffs declined substantially over the years, and in 2015 average tariff in Morocco was 4 percent, 6 percent in Tunisia,7 percent in Egypt, and 6 percent in Jordan. Tariff decline was comparatively less in Pakistan, Nigeria, and Alegria, almost 50 percent decline from 2000 to 2015. The tariff was already less in Brunei and GCC members than in other OIC members. In Cote d'Ivoire, the tariff remained unchanged over the years.

Figure 1: Tariff decline in OIC members



Source: Author's calculation based on WITS data

4.3 AVEs of NTMs

Using the information on AVEs at the product level, we calculate the AVEs of NTMs each year. The countries with the highest AVEs of NTMs identified by Niu et al. (2018) were OIC member states. For example, the countries with average AVEs of more than 80 percent as of 2015, in the entire sample of 97 countries, are low-income OIC countries (Benin, Burkina Faso, Niger, Nigeria, and Senegal). Figure 2 gives the average AVEs increase in OIC countries using available data for 9 OIC countries. The countries are selected based on the information available for both

years.¹² The largest increase is seen in Lebanon (70 percent), followed by Tunisia (68 percent) and Egypt (66 percent). Cote d'Ivoire was the only OIC member where the AVEs decreased from 61 percent to 9 percent from 2003 to 2015. Unlike all the other countries where the tariff declined and the AVEs surged, the tariff in Cote d'Ivoire remained unchanged from 2000 to 2015, and AVEs declined. The results suggest the possibility of substitution between tariffs and NTMs.



Figure 2: Tariff equivalent (AVEs) of nontariff measures in OIC (1997 - 2015)

The authors' calculation is based on Niu et al. (2018)

Using the product-level AVEs, we calculate the AVEs for different product groups in the agriculture and manufacturing sectors.¹³ Then we compute the average for the agriculture sector and manufacturing sector.¹⁴ The sectoral analysis shows that the agriculture sector in OIC countries is more restrictive than the manufacturing sector. Within the agriculture sector, the prepared foodstuffs have the highest average AVEs. As discussed earlier, the most applied NTMs in OIC are SPS, mostly applied

¹² All the AVEs for all individual products in all countries from 1997 to 2015 is not available. Some of the AVEs are zero and some are missing.

¹³ The grouping is based on Harmonized System (HS),

https://wits.worldbank.org/trade/country-byhs6product.aspx?lang=en

¹⁴ Note that the average is not the average of AVEs of the product groups but the average of all the product-level AVEs in agriculture sector

to the agriculture trade. The average AVEs in the agriculture sector is 10 percent greater than the manufacturing average.

Industry Code	Industry Name	AVEs			
1-5	Live animals	0.50			
6-14	Vegetable products	0.53			
15	Fats and oils	0.57			
16-24	Prepared foodstuffs	0.75			
Agricultural mean (1-24)		0.60			
25-27	Mineral products	0.37			
28-38	Chemical products	0.45			
39-40	Rubber and plastics	0.42			
41-43	Raw hide and skins	0.36			
44-46	Wood	0.33			
47-49	Paper	0.41			
50-63	Textile	0.38			
64-67	Footwear	0.54			
68-70	Stone and cement	0.47			
71-83	Base metals	0.47			
84-85	Machinery and electrical equipmen	t 0.53			
86-89	Motor vehicles	0.61			
90-92	Optical and medical instruments	0.67			
93-96	Miscellaneous goods	0.70			
Manufacturing mean (25-96)	-	0.48			
Total mean0.49					

Table 3: AVEs of NTMs by sector in OIC (2015)

The authors' calculation is based on Niu et al. (2018)

The cost of NTMs in all the product groups in the agriculture sector is greater than 50 percent. Most OIC members protect the agriculture sector because the major export items come from the agriculture sector for example, in Pakistan. In the manufacturing sector, the cost is highest (70 percent) for miscellaneous goods, including all kinds of weapons, furniture, toys, stationery, and sanitary.

The next section calculates the overall protection by combining the tariff and total mean of AVEs of NTMs.

4.4 Overall protection

The overall protection estimated using equation (3) is given in table 4.ⁱⁱⁱ It combines the average tariff and average AVEs of NTMs to get the figure for average protection from 1997 to 2015.¹⁵ NTMs give an increase in overall protection as tariffs decline over time. The results show that the average AVEs of NTMs are almost equal to the average tariff in 1997, contributing to 35 percent overall protection. The tariff declined from 17 percent in 1997 to 8 percent in 2015.

years	Observations	OIC-	Average	Average	Overall
1997	30911	10	17.54	17.58	35.11
2000	33401	12	50.70	16.88	67.58
2003	45078	15	51.46	14.69	66.15
2006	50111	17	40.78	12.02	52.80
2009	48445	18	65.34	10.92	76.26
2012	49387	19	44.84	9.68	54.52
2015	42769	18	63.25	8.00	71.25

Table 4: Overall protection in OIC countries 1997-2015

The authors' calculation is based on Niu et al. (2018) and WITS data

On the contrary, AVEs of NTMs continued to increase from 17 percent to 63 percent in 2015. The overall protection, dominated by NTMs protection, increased from 35 percent in 1997 to 71 percent in 2015. For OIC countries, NTMs and tariffs equally contributed to trade protection at the start of 1997, and NTMs have become the dominant source of protection over time. We conclude that the trade-restrictive impact of NTMs is much higher than the tariff in OIC member states. Note that Niu et al. (2018) discuss 97 countries (which include 20 OIC countries), and they concluded that protection provided by NTMs was higher than tariff at the start of the sample also, i.e., 1997. However, we see a different picture showing that the AVEs of NTMs and tariffs were almost equal in 1997. This is because tariffs are the revenue source for developing countries, making it difficult to reduce the tariffs to the minimum level. For example, despite the liberalization policies in Pakistan, tariffs remained the main trade policy tool until 2013 when the government

¹⁵ Tariff is the simple average effective tariff

introduced a wide range of NTMs as regulatory amendments in The Strategic Trade Policy Framework (STPF) 2012-2015. Similarly, as discussed earlier, the tariffs in some OIC countries were very high in 1997.

5 Conclusion

This paper comments on the tariff decline and increasing use of NTMs as a trade protection tool using available information for some OIC countries. The analysis shows that usage of NTMs is on the rise. The pervasiveness scores show that more than 50 percent of the imports in most OIC members are subject to NTMs. SPS measures are the most widely applied. We calculate the sectoral AVEs for different product groups. Our results show that the agricultural sector is more protected than the manufacturing sector. Furthermore, the data shows that the countries having the highest AVEs were low-income OIC countries. These results are consistent with Niu et al.(2018) and Kee et al. (2009). Since the previous studies did not calculate the AVEs using the actual information on NTMs at the product level, this limits the comparison with other studies in the literature. Nevertheless, we see a clear picture of the evolution of NTMs in OIC with a persistent decline in tariffs.

The paper concludes that although in 1997, tariffs and AVEs of NTMs equally contributed to the overall protection, the pattern has significantly changed over the years. As the tariff declines in OIC member countries, the average AVEs and overall protection increased from 35 percent to 71 percent. The paper confirms that the NTMs evolve as a dominant source of trade protection despite the trade liberalization policies in OIC in the form of tariff cuts. NTMs evolve as dominant protectionist tools. The findings of our research are helpful in monitoring and revising the NTMs sector-wise in developing countries. It also calls for export diversification, which is a problem in developing countries. Another important implication of our research is for the exporters. For example, the regulation in each sector is imposed on raw materials and intermediate goods, which increases the cost of production for the exporters at home. Developing countries can enhance their export competitiveness by monitoring, revising, and streamlining NTMs with partners. Although it is not part of our analysis, but the usage of NTMs has increased amid the pandemic. Although NTMs were imposed during the covid-19 led crisis to ensure the availability of essential supplies, the increased protection

will not be beneficial in the long-run if continued as a response to the economic crisis. This calls for a careful study of NTMs, filtering out the unnecessary NTMs imposed purely for protectionist intent, to uplift the vulnerable countries amid the crisis.

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ⁱ Countries included in figure 1 are; Afghanistan, Benin, Burkina Faso, Bangladesh, Bahrain, Brunei, Cote d'Ivoire, Cameron, Algeria, Guinea, The Gambia, Guyana, Indonesia, Jordan, Kazakhstan, Kyrgyzstan, Kuwait, Lebanon, Morocco, United Arab Emirates, Mali, Mauritania, Malaysia, Niger, Nigeria, Oman, Pakistan, Qatar, Saudi Arabia, Senegal, Suriname, Togo, Tajikistan, Tunisia, Turkey.

ⁱⁱ Countries included in the figure 2 are; Algeria, Bahrain, Benin, Brunei, Burkina Faso, Cameroon, Cote d'Ivoire, Egypt, Arab Rep., Guyana, Indonesia, Jordan, Kuwait, Kyrgyzstan, Lebanon, Malaysia, Morocco, Nigeria, Oman, Pakistan, Saudi Arabia, Togo, Tunisia, Turkey

ⁱⁱⁱ The countries included in table 2 are; Afghanistan, Benin, Brunei, Burkina Faso, Cote d'Ivoire, Egypt, The Gambia, Guinea, Indonesia, Kazakhstan, Lebanon, Malaysia, Mali, Morocco, Niger, Nigeria, Pakistan, Senegal, Tunisia, Turkey.

Abdulrahman Abdullah Alsaadi¹

ABSTRACT

It is well-known in Islamic financial institutions that $Rib\bar{a}$ is prohibited under Sharī^cah due to various reasons, such as to ensure equity in exchange and to protect the wealth from unjust and unequal exchanges. In the Islamic financial industry, there are many contracts which are debatable among the scholars. Combining Qard and commutative contracts is one of the contracts in which scholars hold different views. This is due to the Hadith of Prophet (PBUH) "two conditions in one sale are not allowed, nor combining loan and sale, nor selling what is not in one's charge". Thus, this paper aims to investigate whether this type of contract is permissible according to $Shar\bar{\iota}^{c}ah$ or not, as it remains to be an issue of debate. By doing so, the paper aims to analyse the above-mentioned Hadīth through a qualitative analysis, extracting the correct interpretation with specific reference to Malaysian experience. The paper concludes by evidencing that the meaning of loan in the mentioned Hadīth is Oard, while this Hadīth also includes all commutative contracts since they are similar to sale. The paper also elucidates several forms pertaining to the combination of Qard and commutative contracts such as: a) combining Qard and commutative contract by a stipulation in the contract, b) combining *Qard* and commutative contract without a stipulation in contract, c) combining Qard and commutative contract without a stipulation, prejudice or collusion. At the end, the paper provides some recommendations for Islamic financial institutions.

ملخص

معلوم أن الربا محظور في المؤسسات المالية الإسلامية بموجب الشريعة لأسباب مختلفة، مثل ضمان العدالة في معاملات التبادل وحماية الثروة من المبادلات غير العادلة وغير المتكافئة. وفي الصناعة المالية الإسلامية، هناك العديد من العقود المتنازع عليها بين العلماء. ويعتبر الجمع بين عقود القرض والتبادل أحد العقود التي تختلف فيها آراء العلماء. وذلك راجع لما جاء في حديث النبي صلى الله عليه

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وسلم «لَا يَحِلُّ سَلَفٌ وَبَيْعٌ، وَلَا شَرْطَانِ فِي بَيْعٍ، وَلَا رِبْحُ مَا لَمْ تَضْمَنْ، وَلَا بَيْعُ مَا لَيْسَ عِنْدَكَ»وبالتالي، تهدف هذه الورقة البحثية إلى معرفة ما إذا كان هذا النوع من العقود مسموحا به شرعيا أم لا، حيث لا يزال موضع نقاش. وبهذا، تهدف إلى تحليل الحديث المذكور أعلاه تحليلا نوعيا، واستخراج التفسير الصحيح مع إشارة محددة إلى التجربة الماليزية. وتختتم بإثبات أن معنى الائتمان في الحديث المذكور هو القرض، بينما يشمل الحديث جميع العقود التبادلية لأنها تشبه البيع. كما توضح الورقة البحثية عدة أشكال تتعلق بدمج القرض والعقود التبادلية مثل: أ) الجمع بين عقد القرض والعقد التبادلي بنص في العقد، ب) الجمع بين عقد القرض والعقد التبادلي دون شرط في العقد، ج) الجمع بين القرض والعقد التبادلي بدون شرط أو تحيز أو تواطؤ. وفي النهاية، تقدم الورقة البحثية بعض التوصيات للمؤسسات المالية الإسلامية.

ABSTRAITE

Il est bien connu dans les institutions financières islamiques que la $Rib\bar{a}$ est interdite par la Sharī'ah pour diverses raisons, notamment pour assurer l'équité dans l'échange et pour protéger la richesse des échanges injustes et inégaux. Dans l'industrie de la finance islamique, il existe de nombreux contrats qui font l'objet de débats entre les érudits. La combinaison des contrats Qard et commutatifs est l'un des contrats pour lesquels les érudits ont des opinions différentes. Ceci est dû au Hadīth du Prophète (PBUH) " deux conditions dans une même vente ne sont pas autorisées, ni la combinaison du prêt et de la vente, ni la vente de ce qui n'est pas à sa charge ". Ainsi, cet article a pour but d'étudier si ce type de contrat est permis selon la Sharī'ah ou non, car il reste un sujet de débat. Ce faisant, l'article vise à analyser le Hadīth susmentionné par une analyse qualitative, en extrayant l'interprétation correcte avec une référence spécifique à l'expérience malaisienne. L'article conclut en démontrant que le sens du prêt dans le Hadīth mentionné est Qard, tandis que ce Hadīth inclut également tous les contrats commutatifs puisqu'ils sont similaires à la vente. L'article élucide également plusieurs formes relatives à la combinaison du Qard et des contrats commutatifs telles que : a) la combinaison du Qard et du contrat commutatif par une stipulation dans le contrat, b) la combinaison du Qard et du contrat commutatif sans stipulation dans le contrat, c) la combinaison du Qard et du contrat commutatif sans stipulation, préjudice ou collusion. Enfin, l'article fournit quelques recommandations aux institutions financières islamiques.

Keywords: Ribā, Qard, Commutative Contracts, Sharī'ah

JEL Classification: G21

1. Introduction

It is believed that the method of Islamic economics in the fields of trade, business and investment is to be worthy of appreciation and admiration, and it is considered that the approach of Islamic economics is a competitive and valuable in the area of business. This trend along with the development of the Islamic market, is cherished by the extreme favorite of Muslim fraternity to deal with the harmony of the *Sharī'ah's* rules and principles considering what are permissible and prohibited. It is clearly mentioned in authentic *Hadīth* that explains, "What is lawful is clear, and what is unlawful is clear, but between them are certain doubtful things which many people do not know. One who guards against doubtful things will keep his religion and his honor blameless, but one who falls into doubtful things will fall into the prohibited" (Al-Muslim, Hadīth no: 1599).

Significantly, this attitude demands that each and every contract and product of Islamic finance and banking must be permissible under *Sharī'ah* clearly and unambiguously. In this light, there are *Hadīths* of Prophet (PBUH) which apparently show that certain type of contact is not permitted. For Example, "It is not lawful to lend and sell, nor two conditions in a sale, nor to profit from what is not possessed, nor to sell what one does not have" (Al-Sajistānī, n.d., v. 4, p.182; Al-Hākim n.d., v. 2, p.17). Further, the *Hadīth* of Prophet (PBUH): "two conditions in one sale are not allowed, nor combining loan and sale, nor selling what is not in one's charge" (Al-Nasa'i, 2001, v. 5, p. 53; Ibn Hibbān, 1988, v. 10, p.161). According to these two *Hadīth*, combining Qard and commutative contracts is not allowed in Islamic law. However, jurists have different views on the matter. Therefore, the paper has discussed different *fiqhi* interpretations of the above Hadith and formulated following questions to address the juristic debate.

- How to define and determine combination of Qard and cumulative contracts in the above-mentioned Hadith?
- Is it allowed or not to combine both Qard and commutative contracts in Sharī'ah?
- What are the forms of combining Qard and commutative contracts in present practice of Islamic banking?

To answer the above questions, the paper has developed the following objectives:

- To define and determine the combination of Qard and cumulative contracts as prohibited in the Hadith
- To analyse permissible and impermissible combination of Qard and cumulative contracts.
- To evaluate forms of combining Qard and cumulative contracts in present Islamic banking industry with specific reference to Malaysia **0.1 Research Methodology**

The paper is result of a library-based research. It employs the classical jurisprudential discourses on the application of combining *Qard* and commutative contracts in Islamic finance institutions along with an objective to examine the *Sharī* 'ah principles and premises of the subject. Though the paper covers the classical books and treatises on the application of *Qard* and commutative contracts, applies contemporary practices on the subject by employing a textual analysis method.

2. The Fiqhī Origins of the Combining of Qard and Sales

2.1. The Essence of Combining Qard and Sales

Its mentions in the scriptures

- Abdullah bin Amr said that the Prophet (PBUH) said: *"It is not lawful to lend and sell, nor two conditions in a sale, nor to profit from what is not possessed, nor to sell what one does not have"* (Al-Sajistānī, n.d., v. 4, p.182; Al-Hākim, n.d., v. 2, p.17).
- 2) Abdullah bin Amr said:

Oh messenger of Allah, we hear from you some talks do you permit us to write them. Prophet e said: yes. The first thing to be written was the prophet's message to people of Mecca "two conditions in one sale is not allowed, nor combining loan and sale, nor selling what is not in one's charge" (Al-Nasa'i, 2001, v. 5, p. 53; Ibn Hibbān, 1988, v. 10, p.161).

2.1.1. The Meaning of Loan and Sale Mentioned in the Hadīth

It is noteworthy that Qard here is defined as "the transfer of ownership in fungible wealth to a person upon whom it is binding to return wealth similar to it (AAOIFI, 2017). Unlike loan contract where any excess for the lender whether is in terms of quality, quantity, tangible things, benefits etc. is deemed prohibited as it amounts to riba (ISRA, 2016). The meaning of loan and how it is different from Qard has been further explicated in ISRA (2010) any benefit obtained by the lender from his loan is usury of a loan. Thus, there is equal exchange of the same genus in Qard while an excess from the same genus is loan or usury of loan. They also agree that sale in the Hadith means all commutative contracts because they are sales. In Mawāhib Al-Jalīl it is stated that "every commutative contract cannot be combined with loan" (Al-Hattab, 1992, v. 6, p.146; 'Ullaysh, 1299, v. 4, p.501). All jurists' opinions corroborated that notion until it became a rule that commutative contracts are benevolent contracts cannot be combined by a stipulation. Ibn Taymiyah said: "the central meaning of the hadith is to not combine a commutative and benevolence as then benevolence will be a part of the commutative not a pure benevolence" (Ibn Taymiyah 1995, v. 29, p.62).

ISRA (2010) defined sale as "the exchange of any property of value (i.e. lawful) *mal mutaqawwam* for another such item so that ownership of each item is transferred to the other party or to permanently exchange the ownership of a tangible asset or a permissible benefit for financial compensation.

2.2. The Forms of Qard and Commutative Combination and Their Rulings

The combination of *Qard* and commutative contracts into three forms will be detailed in the following paragraphs with its *Sharī*^{cah} rulings:

1. Combination of *Qard* contract and commutative through a stipulation in the contract form: One contract is a condition to the other in a way that a sale will not be concluded unless a *Qard* is advanced or the other way around. It can be in two cases:

First: the case of prejudice. For example, if he loans him with the condition that he leases him a usufruct with a higher price.

Second: without prejudice. For example, a stipulation in the contract that he leases him a usufruct for the same price.

The first case is unanimously prohibited by all scholars. Ibn Qudāmah said: "if he sold him with a condition that he loans him even if the condition is coming from the buyer it is prohibited and the sale is nullified. This is the Madhhab of Mālik and Shāfi'ī which I know of no differing opinion regarding" (Ibn Qudāmah, 1968, v. 4, p.177). Nawawī said: "If he loaned him with a condition that the collateral's benefit belong to the creditor, the *Qard* is nullified" (Al-Nawawī, 1991, v. 3, p. 302). Ibn Taymiyah said: "If he loaned him with a condition that he market, it is disallowed by all Muslims" (Ibn Taymiyah, 1995, v. 30, p.162).

For the second case, the four Madhāhib; Hanafī, (Al-Qarī, 2001, v. 6, p.79; Asshlabī, n.d., v. 4, p.54) Mālikī (Al-Nafrawī, 1997, v. 2, p.144), Shāfi'ī (Al-Shāfi'ī, 1990, v. 5, p.42; Al Māwardī, n.d., v. 5, p.352) and Hanbalī (Al-Ruhaybānī, 1961, v. 3, p.73) disallowed the stipulated combination of *Qard* and commutative contracts irrespective of the situation. Some scholars even reported a consensus on this. For example, Ibn Abdulbarr said: "scholars have a consensus that if one made a sale contract with a stipulation of *Qard* to be received or advanced, this sale is void and nullified" (Ibn 'Abdulbarr, 1967, v. 17, p.90; Al-Bājī, n.d., v. 5, p.29; Al-Qarāfī, 2003, v. 3, p.405). Ibn Qudāmah alluded to these two cases. He said: "if he stipulated in the *Qard* that he rents him his house or sells him something or that he loans him back, it is disallowed as the prophet prohibited a sale and a loan... if he stipulated that rents him his house with price less than the market or that the debtor rents the house of the creditor with a higher price or that he gives him a gift or does him a work, it will be more prohibited" (Ibn Qudāmah, 1968, v. 6, p.437).

Some contemporary scholars allowed the combination of *Qard* and commutative contracts if there is no favoring for the debtor even if it was a contractual stipulation (Al-Qārī, 2001, pp.23-25; Asshubailī, n.d., v. 2, p.454), it has been attributed to Ibn Taymiyah (Al-Qārī, 2001, pp.23-25; Asshubailī, n.d., v. 2, p.454)

and has been adopted by the *Sharī* cah committee of Al-Bilād Bank (2013, p.181). They evidenced this with the following:

First evidence: the prohibition in the *Hadīth* is when there is a favoring of the creditor and if the aim of the creditor is to benefit from the *Qard* using the contract as a circumvention. Therefore, Ibn Taymiyah said after mentioning the *Hadīth* prohibiting a sale and a loan: "it is only -Allah knows best- because he sold him something and loaned him with an increase in price because of the loan which makes the *Qard* with a premium which is *Ribā*" (Ibn Taymiyah, 1998, p.264).

Second evidence: *Sharī*^c*ah* allowed benefiting from the collateral to the extent that the holder of the collateral incurs a cost spending on it as mentioned in the *Hadīth* reported by Abu Huraira t that the prophet r said: "The mortgaged animal can be used for riding as long as it is fed and the milk of the milch animal can be drunk according to what one spend on it. The one who rides the animal or drinks its milk should provide the expenditures" (Al-Bukhārī, 2004, v. 2, p.888). Therefore, if the holder of the mortgagee benefits from that and the debt was due to *Qard*, it will be a combination of *Qard* and a benefit similar to commutative contracts (Asshubailī, n.d., v. 2, p.455).

This second opinion allowing the combination of *Qard* and commutative contracts without a prejudice is considerable, as the purpose of the prohibition is to block the means of the debtor benefiting from *Qard*. Therefore, if the combination of sale and *Qard* does not bring a benefit solely to the debtor, then there is no clear objection in this regard.

2. Combination of *Qard* and a commutative without a contractual stipulation with the existence of prejudice (Hammād, 2004). Jurists have differed regarding the ruling of prejudice in the combination of *Qard* and sale and they have two opinions:

First opinion: It is not allowed to combine *Qard* and a commutative if there is a prejudice even without a contractual stipulation. This is the opinion of Hanafī (Ibn Māzah, n.d., v. 8, p.115) and Hanbalī and Ibn Taymiyah (Ṣāleḥ, n.d., v. 3, p.40)

reported it to be the opinion of the majority (Ibn Taymiyah, 1995, v. 30, p.162).

Second opinion: Allowing the combination of *Qard* and Commutative contract without a stipulation in the contract even if prejudice exists. It is the opinion of Shāfi'ī madhhab (Al-Shāfi'ī, 1990, v. 3, p.75; Assharwānī, n.d., v. 5, p.75).

They built this on their precept that contracts are not affected by intentions and motives unless it is apparent in the contract. Shāfi'ī said: "the basis of my opinion is that any contract that is valid in appearance will not be invalidated by a doubt or a common practice between contracting parties and will be allowed because of the allowance of the apparent. I dislike for them to have a bad intention that if manifested will invalidate the sale" (Al-Shāfi'ī, 1990, v. 3, p.75).

In the Hāshiyah (commentary) of Assharwany and Alabbādi on Tuḥfat Al-Muḥtāj by Al-Haytamī it is said that: "It is well known that the invalidation of a contract is only if the stipulation is in the contract, but if they agreed on it without stipulation in the contract, there will be no invalidation" (Assharwānī, n.d., v. 5, p.74).

The evidence for the first opinion: the increase in the commutative contract is a form of $Rib\bar{a}$ that is disallowed because when a man lends another a thousand and sells him an item that costs five hundred for a thousand, the increase in the price of the item will have no basis except the loan. It is as if he lent him a thousand and got a thousand five hundred back. It becomes a loan that generates a benefit. Without the loan, the debtor would not have accepted the expensive price of the item (Ibn Māzah, v. 8, p.115, and v. 10, p.351).

The evidence for the second opinion: the precept dictates that the original assumption in transaction is permissibility. The prohibition in the $\underline{Had\bar{t}th}$ is taken to mean the case when there is a stipulation and this is built on a precept in the Shāfi'ī that the rulings concerns the apparent while aims and intents are left to Allah the almighty.

2.2.1. The Weighing of Evidences

The opinion with a stronger basis –Allah knows best- is the first one as the intentions of people is known not only by their utterances but also by surrounding circumstances. Therefore, if any of these intentions become apparent through a considerable method, it will be accepted and the ruling will be based on it. Disregarding intentions and motives and only considering apparent utterances and actions will lead to confusion and chaos and hardships especially when it comes to the dearest for people which their dignity and property (Elroughui, n.d., 179).

1. The combination of *Qard* and commutative contracts without a stipulation nor prejudice nor collusion. Jurists differed regarding this into two opinions:

First opinion: It is not allowed to combine *Qard* and commutative contracts even without a stipulation or prejudice or collusion. This is the opinion of Some Mālikīes (Al-Mālik, n.d., 155) and the opinion of Hanbalīes (Al-Buhūtī, n.d., v. 8, p.146).

Second opinion: It is allowed to combine *Qard* and commutative contracts if no stipulation, prejudice or collusion occurs. It is the opinion of the Hanafī (Al-Zayla'ī, 1313 AH, v. 4, p.54), Mālikī (Al-Kharashī, 1317 AH, v. 4, p.54), Shāfi'ī (Al-Shāfi'ī, 1990, v. 5, p.42) and some of Hanbalīes (Al-Mārdāwī, 1995, v. 12, p.351).

Evidence for the first opinion: The Prophet (PBUH) said: "The proviso of a loan combined with a sale is not allowable" (Al-Mārdāwī, 1995, v. 12, p.351).

The deduction: the wording of the $Had\bar{\iota}th$ is general in terms and didn't specify whether the combination is stipulated in the contact or otherwise.

Evidence for the first opinion: the original assumption is that financial transactions are allowed unless otherwise stated. The prohibition only applies when the combination brings about a benefit solely to the creditor as stated above.

2.2.2. The Weighing of Evidences

After laying out the opinions of jurists in this issue, the evidence with a higher weightage is – Allah knows best- that the combination of Qard and commutative contracts is allowed if there is no stipulation, prejudice or collusion that makes the benefit given to debtor intentionally. This is

because the reason for the prohibition of the combination of *Qard* and commutative contracts is getting benefit exclusively from the contract, and in this case, the same reason no longer exists. Hence, it will be allowed to combine *Qard* and commutative contracts without having any previous stipulation.

3. Contemporary Applications of Combining Qard and Sale Contracts in Financial Institutions

3.1. Banks Charging Fees for Safekeeping of Collaterals

The Islamic bank provides the customer with a loan without charging interest with a condition that the customer pledges a valuable property such as gold which the bank will charge a fee for safekeeping of. This fee will be similar to that charged to a customer not taking a loan but higher than the market rate (other than banking sector). In this situation, a *Qard* is being combined with a commutative contract. This is a common practice in many Malaysian banks and non-banking financial institutions especially in the context of the Islamic pawnshop/al-rahn scheme or and rahn-based Islamic microcredit lending facilities by Bank Kerjasama Rakyat and Pos Malaysia (Ahmad et al., 2019 and Hassan & Faakihin, 2018).

The Sharī 'ah ruling: To arrive at the ruling, it is important to know the main factor that could influence the permissibility and otherwise of this practice. Therefore;

- I. *Qard* in this case is linked to the collateral which is allowable. Creditors can ask for collaterals to guarantee their loans.
- II. It is established that the party receiving the collateral should not benefit from such collateral without a counter value. The bank in this situation does not benefit from the collateral. Therefore this form is permissible from that angle.
- III. The bank will stipulate in the contract that a fee is to be paid for the safekeeping of the collateral. In this case, a *Qard* is combined with a commutative contract which is usually carried out in single contract that can't be segregated so we need to look whether this situation involves a prejudice.

Considering the fact that the bank charges a fee similar to that charged to safekeeping without taking a loan, it can be concluded that this situation does not involve a prejudice if we consider the market price to be that of the banking sector.

If the market price means the price in the entire market however, usually referred to in the financial vernacular as (market price), the bank is charging way more than the market price. In this case, prejudice can be seen. Supporting this view:

Depositing gold in banks is quite rare as a worker in a Malaysian bank has told me. Most people deposit their gold in the market as its price is significantly lower than banks. Which indicates that banks intend to benefit from the loan.

- a. Banks don't accept any collateral other than gold which might be significantly higher in value than gold (for example a real-estate property) because they cannot charge a safekeeping fee on such collateral.
- b. If the value of gold decreases significantly bank will not require customers to top up their collateral which is usually the case in other types of financing which raises the doubt that charging a safekeeping fee is not a mere collateral to guarantee the loan.

Viewing these circumstantial evidences, the researcher leans toward the opinion that banks should not charge more than the actual cost of safekeeping which is the opinion of the Islamic Fiqh Academy and AAOIFI.

In its resolution 13 (1/3) in the third conference held in Amman 1407H the Islamic *Fiqh* Academy ruled that: "Firstly, it is allowed to charge fees on the services accompanying *Qard* not exceeding the actual costs" (Resolution No.13 (1/3).

In AAOIFI Sharia standard 57 on gold and the criteria of dealing in gold it is unequivocally stated that fees charged should only amount to the actual cost of safekeeping (AAOIFI, Sharī^cah standards 55).

3.2. The Bank Stipulating That the Customer Opens an Account and Depositing Monies in it.

Some commercial banks stipulate that customers applying for financing facilities should open current account and use it to perform transactions before the bank can provide financing facilities. Banks intend from this stipulation to ensure that customers' accounts reflect their actual cash flows reflected in their financial statements which informs the bank about the liquidity situation of the customer indicating his ability to pay back his financing facilities. To deliberate on the ruling of this stipulation, it is crucial to understand the nature of current accounts and their *Fiqhī* adaptations.

The definition of current account: AAOIFI Sharīah standards defined current account as the money deposit by the customer in the bank which the customer can withdraw at any time (Islamic Fiqh Academy, n.d., 9/1/730, 777, 802, 883).

The Fiqhī adaptation of current account: There are numerous $Fiqh\bar{i}$ opinions regarding the adaptation of current account. I will mention the most prominent of these opinions briefly.

First: adapting it as a *Qard* with the bank as a debtor and the customer as a creditor. It is the opinion of the majority of *Sharīah* researchers (Resolution No. 90/3/9,1995) and the Islamic *Fiqh* Academy which states in its resolution "on-demand deposits (current accounts whether in Islamic banks or *Ribawī* banks are *Qrads* from a *Fiqhī* perspective with the bank required to pay back the full amount of deposit when requested. This doesn't change when the bank is solvent" (AAOIFI, Sharī'ah standard 19). It is also the opinion of AAOIFI (Al-Mutrik, p.346; Asshubailī, p.6).

This opinion is evidenced by:

- I. The fact that the bank owns these monies, has the right to dispose it off, owns the profit arising from it, and is required to pay it back in full amount which the meaning of *Qard*.
- II. The bank is required to guarantee the amount whether or not a negligence or misconduct is involved.

Second: which is the opinion of Dr. Hassan Al-Amīn in his book "bank deposits and its investment in Islam" (Al-Amīn, p.199). It is also deliberated by Maliki scholars under the topic of taking a loan from a trusted amount ($Wad\bar{i}$ ah) whereby they opined that if the trustee is solvent and was able to return the amount he will not be required to pay it back irrespective of negligence or misconduct and it will remain as a trust ($Wad\bar{i}$ ah) (Al-Māzarī, 2008, v. 2, p.1130).

This means that if current account is a trust will not be affected by the bank using a part of it for his own benefit. The bank will only be required to pay back that part and the rest will remain as trust. It is well known that banks don't take the full amount as a loan, rather they keep a part of it, deposit another part with the central bank, and uses the rest as a loan.

Third: current account is a complex contractual structure and not a single contract. It includes elements of *Qard*, trust, agency and maybe other elements of other contracts with every contract having its own rulings and conditions. Those who opined for this relied on the general wording of evidences indicating that transaction are presumed to be allowed unless otherwise stated by Allah or his messenger (Hammād, 2008).

The opinion which the researcher leans towards the researchers find it less likely that current account is a form of complex contractual relation because if the contract can be adapted, there is no need to make it a new contract.

Likening current account to trust, although carries some merit as the intention is to safekeep the money and ease the access to it, overlook many differences between current accounts and trust like the following:

- a. The bank is permitted to use the money.
- b. The bank guarantees the money.
- c. The bank is required to pay a similar amount and not the actual currency notes whether or not the money is consumed.
- d. The recourse of the customer is to the obligation of the bank not to the actual currency notes.
- e. The profit arising from the money belong to the bank not to the customer (Hammād, 2008).

Also, trust is not to be disposed of, and if so is allowed under the permission of the owner, it becomes a loan as mentioned by Mālikīes.

In addition, the legal perspective on current account is that it is a loan and not a trust as mentioned in the Egyptian civil law article (726): "If trust is an amount of money or anything else that is consumed by utilization and the trustee is allowed to use it, it is considered a loan" likewise in the Iraqi, Syrian, Jordanian, Kuwaiti, Emirati, and Algerian civil laws (Shaḥādah, n.d.).

This is also the customary banking practice as bank receive and give loans with interest.

Considering current accounts, a form of trust because some characteristics of loans don't manifest in it does not negate the adaptation as it is not practically possible to deduct from the account for the purpose of loaning out then adding it back.

It is also well known that banks seek to increase their deposits to reduce its financing costs by giving out gifts and rewards.

Based on the above, it can be said that current accounts resemble *Qard* more than trust (*Wadī*'*ah*) but there are differences as there was no intention of benevolence upon opening the account especially considering that both parties benefit from the contract.

The Sharī'ah ruling: If the bank stipulates opening an account and creating a movement for the customer to be eligible to receive a financing and the intention of the bank of such stipulation is to benefit from the amounts, it is becomes similar to the issue of (loan me and I loan you) which is not allowed by majority of scholars Mālikīes (Al-Ḥatṭāb, v. 4, p.391), Shāfi'īes (Al-Shirāzī, 1992, v. 2, p.83) and Ḥanbalīes (Al-Buhūtī, n.d., v. 3, p.317; Najeeb and Lahsasna, 2013; Al-Hzza', 2019).

If the banks didn't intend to benefit from the monies deposited and only wants to verify the cash flows of the customer and his liquidity situation, there seems to be no objection from a *Sharīah* perspective to such practice as actions are presumed to be allowable unless otherwise stated and there is no clear statement disallowing this practice especially considering that banks allow customers to withdraw the amount and transfer it at any time

which indicates that the intention of the bank to benefit from the contract is insignificant (Al-Hzza', 2019).

3.3. The Bank Stipulating that the Customer Receives his Salary on his Account with the Bank

Some commercial banks stipulate that customers applying for financing facilities receive their salaries on their accounts with the bank. This usually happens when the customers applies for financing facilities and the bank will not start the process of financing before it ensures that the customer receives his salary on his account with the bank.

The Sharī 'ah ruling: To arrive at the *Sharī 'ah* ruling we need to know the intention of the bank from such stipulation which can be divided into two cases as follows:

First case: the bank's intention is to benefit from the salary of the customer received on his account with the bank. This will carry a similar ruling to the one mentioned above i.e. the prohibition of (loan me and I loan you).

Second case: The banks intention is not to benefit from monies but to guarantee the payment of financing facilities by deducting the installments from account once the salary is received without referring to the customer. In this case it is allowed (Asshubailī, v. 2, p.454) as conditions are presumed to be allowed unless otherwise stated. There is no evidence to disallow this practice as the bank allows the customer full freedom to withdraw from his account and only deducts the instillment.

4. Conclusion

The study concludes that scholars agree that the meaning of loan mentioned in the *Hadīth*: "The proviso of a loan combined with a sale is not allowable" is *Qard* and that this *Hadīth* includes all commutative contracts as they are similar to sale. Also, the combination of *Qard* and commutative contract can be in several forms. Firstly, combining *Qard* and commutative contract by a stipulation in the contract. If it carries a prejudice, it unanimously disallowed. If there is no prejudice and the contract does not give an exclusive benefit to the creditor it is permissible. Secondly, combining *Qard* and commutative contract without a stipulation is not allowed if a prejudice is involved. Finally, combining

Qard and commutative contract without a stipulation, prejudice or collusion is allowed as the rationale for disallowance is absent.

5. Recommendations

The following is recommended for banks;

- It is not allowed for banks to charge a fee for the safekeeping of collateral above the actual cost as decided by Islamic Fiqh Academy and AAOIFI.
- It more likely that monies deposited in current account are *Qard* and not trust (*Wadī*'ah)
- It is not allowed to stipulate opening bank accounts if the intention is for the bank to benefit from the monies deposited.
- It is allowed to stipulate opening bank accounts if the intention is to verify the cash flows mentioned in the financial reports.
- It is not allowed for the bank to stipulate receiving the customer's salary on his account with bank if the intention is to benefit from the monies transferred.
- It is allowed for the bank to stipulate receiving the customer's salary on his account with bank if the intention is to ensure that bank can deduct the installments.

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Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500.

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Impact of Islamic Finance on Economic Growth

M. Kabir Hassan¹, Shadiya Hossain², and Hasib Ahmed³

ABSTRACT

We estimate the influence of relative strength of Islamic finance on GDP growth for OIC countries, as well as the whole world. We examine both static and dynamic relationship between Islamic finance and economic development using the panel data. We find that Islamic finance has a strong positive relationship with economic growth. We also use propensity score matching in our analysis to account for variables predictive of log(GDP). Finally we address selection bias by using an iterative Markov Chain Monte Carlo method to fill in the missing variables. Both of these techniques reinforce our primary findings.

ملخص

نقدر تأثير القوة النسبية للتمويل الإسلامي على نمو الناتج المحلي الإجمالي لدول منظمة التعاون الإسلامي، وكذلك العالم بأسره. وندرس العلاقة الثابتة والديناميكية بين التمويل الإسلامي والتنمية الاقتصادية باستخدام بيانات اللوحة. ووجدنا أن التمويل الإسلامي له علاقة إيجابية قوية مع النمو الاقتصادي. ونستخدم أيضا مطابقة درجة الميل في تحليلنا لحساب المتغيرات التنبؤية للسجل (الناتج المحلي الإجمالي).وأخيرا، نتعامل مع تحيز الاختيار باستخدام طريقة سلسلة ماركوف مونتي كارلو التكرارية لملء المتغيرات المفقودة. وكلتا الطريقتين تعزز النتائج الأولية التي توصلنا إليها.

ABSTRAITE

Nous estimons l'influence de la force relative de la finance islamique sur la croissance du PIB pour les pays de l'OCI, ainsi que pour le monde entier. Nous examinons la relation statique et dynamique entre la finance islamique et le

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développement économique en utilisant des données de panel. Nous constatons que la finance islamique a une forte relation positive avec la croissance économique. Nous utilisons également l'appariement par score de propension dans notre analyse pour tenir compte des variables prédictives du log (PIB). Enfin, nous nous attaquons au biais de sélection en utilisant une méthode itérative de Monte Carlo par chaîne de Markov pour combler les variables manquantes. Ces deux techniques renforcent nos principaux résultats.

Keywords: Islamic banking; financial inclusion; economic development; poverty

JEL Classification: E44; E52; F6; G2; O16

1. Introduction

Developing a robust banking sector can lead to economic development. The development can be achieved through better capital accumulation, formation and allocation, monitoring, and diversification. However, religious restrictions among Muslim majority countries can discourage people to participate in the conventional banking industry as receiving or paying interests is forbidden in Islam.

There are almost 1.6 billion Muslims in the world, making up about 24% of the world's population. According to Naceur, Bajaras, and Massara (2015), only 27 percent of Organisation of Islamic Cooperation (OIC) countries households have an account at a formal institution, which compared to the rest of the world at 55 percent, is very low. Many of these individuals are voluntarily excluded from the financial system since the current financial system goes against the system of Islamic religious rules known as the Shari'a. In recent years, there has been an increase in Shari'a compliant financial products and insurances, which plays a significant role in increasing the level of financial inclusion of Islamic countries.

The positive impact of financial sector development on growth is already established in the literature (see among others Beck, Levine, and Loayza (2000)). Researchers have argued that the presence of Islamic finance promotes higher financial inclusion by attracting voluntarily excluded people to the financial system, thereby promoting growth in the country and reducing poverty (Beck, Demirgüç-Kunt, and Levine, 2004). We are reexamining the argument that Islamic financial institutions can have a more pronounced effect on growth than their conventional counterparts.

We empirically study whether the strengthening of Islamic finance relative to conventional finance in a country promotes higher growth. Here, we are assuming that the development of the banking sector positively impacts growth. This study tests whether bringing in Islamic banks in the mix adds anything to growth. We contribute to the literature by presenting proof that Islamic finance can contribute to growth on an economy on a higher scale than their conventional counterparts. This better performance can be achieved through mitigating voluntary financial exclusion, unique investment participation, or monitoring practices.

This study is important for multiple reasons. First, researching Islamic countries will provide useful information about the relationship between financial system catered to a high voluntarily excluded population and economic growth. The demand for Shari'a compliant financial services is expected to increase and this information will be useful to provide the desired financial products. Secondly, Shari'a compliant financial products have relatively low speculative characteristics compared to conventional financial services and therefore has attracted a lot of attention in recent years. Being able to see whether such products can do any better than their conventional counterparts to promote growth may help policymakers move towards a more inclusive financial system.

We begin our study by generating proxy variables for growth and relative strength of Islamic finance. We also identify a few control variables that have been shown to impact growth. We use both static and dynamic panel models to identify the effects of Islamic finance in short-run and long-run growth. The results show that Islamic finance promotes economic growth in the short-run. However, any significant short-run impact of Islamic finance in absent in the OIC subsample. In the long-run, the contribution of Islamic finance is much stronger for OIC countries. The study further uses propensity score matching to see the likelihood of Islamic finance promoting growth. The results indicate that Islamic finance has a significantly positive impact on growth. Considering a large number of missing observations in OIC subsample, we impute the missing variables using an iterative Markov Chain Monte Carlo method and run the same analyses for further consistency. The findings stay consistent in general.

The rest of the paper is organized as follows: Section 2 is Literature Review, Section 3 goes over the data and methodology, Section 4 shows the results, and Section 6 concludes.

2. Literature Review

There have been several studies linking Islamic finance to economic growth. Furqani and Mulyany (2009) conducted one of the earliest studies to connect Islamic finance with growth where they examine the dynamic interactions between Islamic banking and economic growth of Malaysia. They find that in the short-run only fixed investment that granger cause Islamic Bank to develop. Whereas in the long-run, there is evidence of a bidirectional relationship between Islamic bank and fixed investment and there is evidence to support 'demand following' hypothesis of GDP and Islamic bank, where an increase in GDP causes Islamic banking to develop and not vice versa.

A study by Gheeraert (2014) shows that the increase of Islamic banking in Muslim countries does increase banking sector development with increased private credit and bank deposits (scaled to GDP). They find that the Islamic banking sector complements the conventional banking sector and should not replace it but co-exist in Muslim countries. We are trying to build on the results of Gheeraert (2014) in this study to see how increasing Islamic banking in Muslim countries will better their economies.

Kassim (2016) evaluates the contribution of Islamic finance to real economic activity. Their findings suggest that Islamic finance has

important contributions to the real economy. They believe that Islamic banking needs to increase in Malaysia to keep growing their economy. Expanding on the previously mentioned study, Daly, and Frikha (2016) studies the role of Islamic banks in the growth of GDP of developing countries. Their investigation reveals that the development of Islamic banks supports economic growth. As was found in previous studies, they also find that the cooperation of Islamic and conventional banking improves economic growth. Imam and Kpodar (2016) also study the relationship between Islamic banking development and economic growth. And also finds that Islamic banking is positively associated with economic growth.

In this paper, we are building on previous studies done on Islamic banking and economic growth. We are trying to prove, as others have done, that Islamic banking is a very useful tool in growing the economy in developing Muslim countries and that in working with conventional banks these countries can grow and stabilize their economies and in turn improve the lives of its' citizens.

3. Data and Methodology

3.1. Data

We use the growth⁴ of Gross Domestic Product (GDP) per capita (constant in 2005 USD) as a measure of economic development (henceforth, GDPG). Previous studies show that a number of economic variables contribute to GDPG. Education level, average income, national capital accumulation, national capital formation, openness to trade (or dependence on external sector), and macroeconomic stability are some of the most widely accepted contributors to growth. We use these variables as controls in measuring the effect of Islamic finance on growth.

We use the average years of total schooling completed among people over the age of 15 as a proxy for the level of education (SCH). We use GDP per capita as a proxy for average national income (INC). The ratio of gross

⁴ $GDPG_t = \ln(GDP_t) - \ln(GDP_{t-1})$

national savings in current local currency and GDP in current local currency proxies for national capital accumulation (SAV). The ratio of total investment in current local currency and GDP in current local currency proxies for national capital formation (INV), the ratio of international trade (import plus export of goods and services) and GDP in current local currency proxies for dependence on external sector (TR), and the percentage change in consumer price index (inflation) proxies for macroeconomic stability (INF). We normalize each of the variables by taking logarithms.

Proxies for SAV, INV, and INF are collected from IMF World Economic Outlook (WEO), GDPG and INC are from Global Financial Development Database (GFDD), TR from IMF Balance of Payments Statistics Yearbook and data files, and SCH from World Development Indicators of the World Bank.

We use three different measures as proxies for the strength of Islamic finance, we could follow Imam and Kpodar (2016), where Islamic banking asset, deposit, and lending as a share of GDP are used as proxies for development of Islamic banking. We deviate from their measure because using both dependent and our focus independent variable as a function of GDP can give rise to potential bias in a linear setting. It can also make the results difficult to interpret. So, we use ratios of Islamic banking variables and non-Islamic banking variables. This approach will show how Islamic banks are doing compared to non-Islamic banks. Specifically, we use the following three measures as proxies for the strength of Islamic finance in our analysis.

1.
$$IS_{AT} = \frac{Islamic \ Banking \ Assets}{Non-Islamic \ Banking \ Deposits}$$

2. $IS_{DEP} = \frac{Islamic \ Banking \ Deposits}{Non-Islamic \ Banking \ Deposits}$

3. $IS_{LIAB} = \frac{Islamic \ Banking \ Liabilities}{Non-Islamic \ Banking \ Liabilities}$

Each of these measures provides the relative strength of Islamic baking in terms of asset share, deposit share and liability share in a country. These measures will show whether Islamic banking is contributing enough in overall banking sector development. For example, if the overall banking system is doing very well in a country where Islamic banking sector is barely improving, the measures will show that Islamic banking is relatively worsening. This approach will allow us to investigate whether Islamic banking by itself (unique banking practice) adds anything to growth.

We collect banking data from Bankscope. We add assets, deposits, and liabilities of all Islamic (non-Islamic) banks to get total Islamic (non-Islamic) banking assets, deposits, and liabilities respectively. After estimating the strength variables, we use the first difference of each of these variables as a measure of improvement (or dis-improvement when negative) of relative strength of Islamic finance. We focus our analyses on relative strength, rather than just strength, because the banking sector rarely contracts. It is always expanding (both Islamic and non-Islamic), whereas the economic strength can vary between years. Using a measure for relative strength will be able to capture how aggressively Islamic finance is moving compared to conventional finance in a particular country.

Our combined database includes economic variables and Islamic finance measures from a sample of 230 countries during the period 1990 through 2014. However, many countries have a number of missing observations; therefore, we only keep countries with at least 15 years of available data. In doing so we end up with 154 countries and 3596 country-year observations. Summary statistics of macroeconomic variables are shown in Table 1 and Islamic finance variables are shown in table 2. Difference in means are also provided in these tables. Table 1 shows that countries with Islamic banking and OIC countries achieved lower growth, compared to their counterparts. The same trend is found in education, income level, capital accumulation and formation, and openness to external market. Only capital accumulation is found to be higher in Islamic banking countries. OIC and Islamic banking countries are also suffering from higher macroeconomic volatility.

	Whole Sample						OIC subsample				
	Combine	dNon-OI(COIC	Difference in Means	eNon-IB	B	Difference in Means	Combined	lNon-IB	IB	Difference in Means
GDPG	60.0217	0.0226	0.0193	0.0033*	0.0223	0.0177	0.0046**	0.0193	0.0214	0.0158	0.0056*
	(0.0446)	(0.0441)	(0.0459)(0.0017)	(0.0456)(0.0367)(0.0022)	(0.0459)	(0.0501)(0.0380)(0.0031)
	3543	2618	925		3087	456		925	572	353	
SCH	2.0325	2.1526	1.6613	0.4912***	2.0584	1.8807	0.1777***	1.6613	1.5516	1.7928	-0.2412***
	(0.4512)	(0.3518)	(0.5179)(0.0170)	(0.4533)(0.4070)(0.0232)	(0.5179)	(0.5718)(0.4084)(0.0374)
	2996	2264	732		2560	436		732	399	333	
INC	8.2210	8.5035	7.4200	1.0835***	8.2241	8.2001	0.0239	7.4200	6.9717	8.1456	-1.1739***
	(1.5832)	(1.5417)	(1.4172)(0.0577)	(1.6075)(1.4091)(0.0793)	(1.4172)	(1.1949)(1.4494)(0.0877)
	3555	2628	927		3098	457		927	573	354	
SAV	2.9242	2.9463	2.8623	0.0840***	2.9031	3.0643	-0.1612***	*2.8623	2.7577	3.0308	-0.2732***
	(0.5982)	(0.5347)	(0.7450)(0.0234)	(0.5869)(0.6521)(0.0304)	(0.7450)	(0.7528)(0.7012)(0.0507)
	3365	2480	885		2923	442		885	546	339	
INV	3.1112	3.1263	3.0702	0.0561***	3.1120	3.1058	0.0062	3.0702	3.0572	3.0918	-0.0346
	(0.3593)	(0.3206)	(0.4459)(0.0139)	(0.3663)(0.3089)(0.0183)	(0.4459)	(0.5083)(0.3144)(0.0306)
	3382	2475	907		2940	442		907	568	339	
TR	4.3130	4.3427	4.2295	0.1133***	4.3205	4.2623	0.0582**	4.2295	4.2054	4.2685	-0.0631*
	(0.5247)	(0.5378)	(0.4765)(0.0201)	(0.5151)(0.5829)(0.0264)	(0.4765)	(0.3999)(0.5781)(0.0324)
	3484	2569	915		3032	452		915	566	349	
INF	0.0691	0.0683	0.0714	-0.0031	0.0687	0.0716	-0.0029	0.0714	0.0728	0.0691	0.0038
	(0.1064)	(0.1060)	(0.1076)(0.0041)	(0.1082)(0.0938	(0.0053)	(0.1076)	(0.1133)(0.0983)(0.0073)
	3453	2535	918		2992	461		918	560	358	

 Table 1: Macroeconomic variables

Descriptive statistics of economic variables from a sample of 230 countries during the period 1990 through 2014. GDPG is defined as GDP growth per capita constant in 2005 USD. SCH education is a country proxied by average years of total schooling completed among people over age 15, INC is initial income defined as log of GDP per capita, SAV is national saving defined as log of the ratio of gross national savings in current local currency, and GDP in current local currency, INV is national investment defined as log of the ratio of total investment in current local currency and GDP in current local currency. Proxies for SAV, INV and INF are collected from IMF World Economic Outlook (WEO), GDPG and INC are from Global Financial Development Database (GFDD), TR from IMF Balance of Payments Statistics Yearbook and data files, and SCH from World Development Indicators of the World Bank.

For each variable, the first row is mean, the second row (the number in parenthesis) is standard deviation (standard error for the difference in means column), and the last row is the count of observations. Statistics are reported for the whole sample and the OIC countries sample. Difference in means performs t-test on means equality.

	Combined	Non-OIC	OIC	Difference in Means
ISAT	0.1704	0.0531	0.5023	-0.4491***
	(2.4932)	(1.5600)	(4.0979)	(0.0950)
	3552	2625	927	
IS _{DEP}	0.1578	0.0424	0.4827	-0.4403***
	(2.2876)	(1.2404)	(3.9383)	(0.0873)
	3527	2603	924	
ISLIAB	0.1677	0.0527	0.4933	-0.4406***
	(2.4547)	(1.5475)	(4.0220)	(0.0935)
	3552	2625	927	

 Table 2: Islamic finance variables

Descriptive statistics of Islamic finance variables. Here, IS_{AT} is the ratio of assets, IS_{DEP} is the ratio of deposit, and IS_{LIAB} is the ratio of liabilities shares of Islamic banks and non-Islamic banks in a country.

For each variable, the first number is mean, the second number (the number in parenthesis) is standard deviation (standard error for the difference in means column), and the last number is the count of observations. Statistics are reported for the whole sample and the OIC countries sample. Difference in means performs t-test on means equality.

Numbers in parentheses are robust standard error. *** indicates significance at 1%, ** indicates significance at 5%, and * indicates significance at 10%.

People in OIC countries are more likely to voluntarily exclude themselves from the financial system for the lack of access to Shari'a compliant financing. Considering that the need of Islamic finance is much more dominant in these countries, we separate them from the sample and analyze them separately. In table 2, we see that the difference in means analysis for Islamic finance measures show very large and significant difference between OIC and non-OIC countries. We see that in general, Islamic banking countries show higher strength in education, income, capital accumulation and formation, and macroeconomic stability, but shows more dependence on external trade, and less per capita GDP growth.

Although we start with 154 countries in our sample, we will be able to use 118 countries in our primary analyses, because these analyses will require all the variables present for each country in each year.

3.2. Methodology

In any macroeconomic analysis, country-specific factors can give rise to heterogeneity in the sample. It is of paramount importance that we control for such heterogeneity before drawing any conclusion from our analyses. Therefore, we use a GLS measure to find the effect of Islamic finance on economic development. However, we do not make any prior assumption as to whether the country specific effects are correlated with independent variables. We perform a Durbin-Wu-Hausman test to tackle this problem and find that they are correlated which makes the fixed effects model applicable to our analysis. So, we fit the following GLS fixed effect estimator.

$$GDPG_{i,t} = IS_{i,t}\beta + X'_{i,t}\gamma + \alpha_i + u_{i,t}$$
(1)

Where,

GDPG = GDP growth per capita in 2005 US dollars,

 $IS_{i,t}$ = Islamic finance measures, such as IS_{AT} , IS_{DEP} , and IS_{LIAB} , for country i and year t,

 $X_{i,t}$ = A vector of control variables, such as SCH, INC, SAV, INV, TR, and INFL, for country i and year t,

 α_i = Unobserved time-invariant individual effects, and

$u_{i,t}$ =error term

We are also concerned that the lagged dependent variables and the error terms could be correlated, and thus make our estimation biased. To handle this issue, Arellano and Bond (1991) suggested a generalized method of moments (GMM) method that estimated a dynamic panel model, which can remove the autocorrelation of the error term and reduce the correlation between endogenous variables and the error term. They suggest first-difference the regression equation to eliminate the country-specific effect, as follows.

$$y_{i,t} - y_{i,t-1} = \alpha' (X^{1}_{i,t-1} - X^{1}_{i,t-2}) + \beta' (X^{2}_{i,t} - X^{2}_{i,t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1})$$
(2)

However, first-differencing can some problems. First, we lose the pure cross-country dimension of the data. Second, differencing may decrease the signal-to-noise ratio, thereby exacerbating measurement error biases. Also, Alonso-Borrego and Arellano (1999) and Blundell and Bond (1997) show that if the lagged dependent and the explanatory variables are persistent over time, lagged levels of these variables are weak instruments for the regressions in differences. Therefore, to deal with these issues we use an alternative method that estimates the regression in differences jointly with the regression in levels, as proposed by Arellano and Bover (1995).⁵ They argue that lagged differences are valid instruments for the regression in levels, and propose the moment conditions for the regressions in levels as follows:

$$E[(X_{i,t-s} - X_{i,t-s-1}) (\varepsilon_{i,t} + \mu_i))] = 0 \text{ for } s = 1; t$$

= 3, ..., T. (3)

Moreover, they design this model particularly for a dataset of many panels and few time periods. Our sample is similar in nature with 154 panels and up to 25 time periods. Here, we define y as GDPG and X^2 as IS variables and control variables.

We then do propensity score matching to estimate the effect of Islamic finance on log(GDP) by accounting for variables predictive of log(GDP). We follow the methodology proposed by Abadie and Imbens (2006). This technique allows a look at two treatment levels: the treatment group with t = 1 and a control group with t = 0. We follow the binary treatment potential outcome model where log(*GDP*)₁ is the potential outcome obtained by each country if Islamic finance treatment is given a level t = 1 and log(*GDP*)₀ is the potential outcome if the level t = 0 for each country *i*. Then, we estimate the average treatment effect (ATE), $\tau_1 =$

⁵ Using Monte Carlo experiments, Blundell and Bond (1997) show that this system estimator reduces the potential biases in finite samples and asymptotic imprecision associated with the difference estimator.

 $E(\log(GDP)_1 - \log(GDP)_0)$ and average treatment effect among treated (ATET), $\delta_1 = E(\log(GDP)_1 - \log(GDP)_0 | t = 1)$. The advantage of using this model is that the treatment probability model parameterizes the bias-correction term. This way it reduces the bias coming from confounding variables and reduces the likelihood of ending up with a spurious association.

The focus of our analysis is countries with Islamic finance. Many of these countries have missing observations in our sample. We want to make sure that the dropped country-years due to missing observations are not influencing our findings. To do so, we replace the missing observations and run the same models to see whether our findings are caused by selection bias, that is whether we are drawing a generalized conclusion from countries with more available data. We use an iterative Markov Chain Monte Carlo method to fill in the missing variables (see Gelman, Carlin, Stern, and Rubin (2004); Little and Rubin. (2002)). This method uses observed data to simulate imputed values from the posterior predictive distribution of the missing observations. We use a multivariate normal regression model and 3000 iterations for each missing observation. More specifically, we subsample the non-missing data and run a sequence of 3000 iterations until the sequence reaches stationarity to produce a sequence of independent draws from the distribution.

4. Results

4.1 Short-term analyses

We focus our analysis on the short-term effect of an increase (or decrease) in the strength of Islamic finance at the beginning. We start with a panel fixed effect model (a static panel data model), where we regress three Islamic finance measures on GDP growth per capita while controlling for a few macroeconomic variables, such as education level, average income, national capital accumulation, national capital formation, openness to trade (or dependence on external sector), and macroeconomic stability. We select a fixed effect model instead of a random effect model because this model will always provide consistent results. The Durbin-WuHausman test, reported in Table 3, shows that the random effect model would be inconsistent for our sample.

	Whole Sample	!		OIC subsam	ple	
ΔΙS _{AT}	0.0002**			0.0000		
	(0.0001)			(0.0001)		
ΔIS _{DEP}		0.0006***			0.0004*	
		(0.0001)			(0.0002)	
ΔIS _{LIAB}			0.0001			0.0000
			(0.0001)			(0.0001)
SCH	-0.0200*	-0.0190	-0.0200*	-0.0171	-0.0171	-0.0171
	(0.0122)	(0.0122)	(0.0122)	(0.0127)	(0.0128)	(0.0127)
INC	-0.0035	-0.0039	-0.0035	0.0144	0.0142	0.0145
	(0.0088)	(0.0089)	(0.0088)	(0.0137)	(0.0139)	(0.0137)
SAV	0.0096***	0.0098***	0.0097***	0.0118**	0.0123**	0.0118**
	(0.0026)	(0.0026)	(0.0026)	(0.0048)	(0.0047)	(0.0047)
INV	0.0299***	0.0300***	0.0299***	0.0134	0.0131	0.0134
	(0.0068)	(0.0068)	(0.0068)	(0.0104)	(0.0105)	(0.0104)
TR	0.0094	0.0097***	0.0093	-0.0075	-0.0066	-0.0075
	(0.0058)	(0.0058)	(0.0058)	(0.0145)	(0.0146)	(0.0145)
INFL	-0.0743***	-0.0762***	-0.0743***	-0.0621*	-0.0665*	-0.0621*
	(0.0207)	(0.0206)	(0.0207)	(0.0339)	(0.0344)	(0.0339)
α	-0.0653	-0.0657	-0.0654	-0.0987	-0.1017	-0.0992
	(0.0507)	(0.0507)	(0.0507)	(0.1034)	(0.1049)	(0.1035)
Ν	2524	2520	2524	642	640	642
Countries	118	118	118	31	31	31
F-test	9.60	9.65	9.39	14.36	4.34	570.62
$\overline{\chi}^2$	180.56	179.73	180.36	28.07	28.59	28.04
χ^2	29.65	21.59	30.17	21.25	21.85	21.26
R ²	0.0661	0.0688	0.0662	0.0025	0.0021	0.0026

Table 3: Short-term development of Islamic finance (Static Panel Model)

Panel regression using GLS estimator of first difference of three different Islamic finance variables, IS_{AT}, IS_{DEP}, and IS_{LIAB} on GDP growth, where SCH, INC, SAV, INV, TR, and INFL are used as control variables. Here, Δ IS_{AT}, Δ IS_{DEP}, and Δ IS_{LIAB} represent growth in relative market share of assets, deposits, and liabilities for Islamic banks. SCH represents the level of education, INC represents the level of development, SAV represents gross capital accumulation, INV represents gross capital formation, TR represents the effect of external sectors, and INFL represents macroeconomic stability.

N is number of observations, $\bar{\chi}^2$ reports Breusch and Pagan Lagrangian multiplier test statistic, and χ^2 reports Durbin-Wu-Hausman test statistic.

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Table 3 reports the results for both whole sample and OIC countries sample. The results indicate that increase in relative strength of Islamic finance assets and deposits have significantly contributed to the growth of the countries. Islamic finance liabilities, however, have no significant relationship with growth. As for the OIC subsample, only Islamic finance deposits have a significant (positive) effect on growth.

We further use a dynamic panel data model, that uses generalized methods of moments (GMM) to estimate the effect of Islamic finance on growth. This technique uses lagged difference of growth and a constant as instruments for level equation, and two lags of growth, second difference of Islamic finance measure and first difference of controls as instruments for difference equation. The results are presented in Table 4.

Here, we can see that the increase in relative strength of Islamic finance assets and liabilities significantly contributes to the growth in our full sample. On the other hand, Islamic finance has no significant contribution to growth in the OIC subsample.

Our analyses indicate that Islamic finance on average is positively related to growth in the short run for the whole sample. However, the group (OIC countries) which is more likely to have higher voluntary financial exclusion fails to show any immediate outcome of Islamic finance. It would not be wise to draw final conclusions from only the short-term effect of Islamic finance. Many economic factors take years to bring fruit to the economy. So, we look at the long-term effect of Islamic finance on growth in the next section.

Whole Sample			OIC subsample			
GDPG _{t-1}	0.1734***	0.1730***	0.1734***	0.0570	0.0580	0.0569
	(0.0392)	(0.0392)	(0.0392)	(0.0860)	(0.0861)	(0.0860)
ΔΙS _{AT}	0.0005**			0.0003		
	(0.0002)			(0.0002)		
ΔIS_{DEP}		0.0005			0.0002	
		(0.0004)			(0.0002)	
ΔIS _{LIAB}			0.0004*			0.0002
			(0.0002)			(0.0002)
SCH	-0.0323	-0.0329	-0.0323	0.0066	0.0057	0.0065
ben	(0.0231)	(0.0236)	(0.0231)	(0.0163)	(0.0162)	(0.0163)
INC	-0.0058	-0.0057	-0.0058	-0.0132**	-0.0130**	-0.0132**
	(0.0080)	(0.0081)	(0.0080)	(0.0054)	(0.0054)	(0.0054)
SAV	0.0161***	0.0164***	0.0161***	0.0164**	0.0165**	0.0164**
	(0.0050)	(0.0051)	(0.0050)	(0.0069)	(0.0069)	(0.0069)
INV	0.0627***	0.0625***	0.0627***	0.0169	0.0166	0.0169
	(0.0109)	(0.0109)	(0.0109)	(0.0202)	(0.0202)	(0.0202)
TR	0.0318***	0.0318***	0.0318***	-0.0011	-0.0006	-0.0013
	(0.0115)	(0.0115)	(0.0115)	(0.0161)	(0.0158)	(0.0161)
INFL	-0.0510*	-0.0527*	-0.0510*	-0.0686	-0.0706	-0.0685
	(0.0307)	(0.0311)	(0.0307)	(0.0470)	(0.0473)	(0.0470)
α	-0.2439***	-0.2442***	-0.2437***	0.0138	0.0122	0.0141
	(0.0575)	(0.0589)	(0.0575)	(0.0698)	(0.0700)	(0.0697)
N	2515	2511	2515	640	638	640
Countries	118	118	118	31	31	31
Instruments	307	307	307	307	307	307
Wald χ^2	104.66	104.20	104.25	24.22	24.99	23.98
AR(1) (z test)	-7.4920	-7.4883	-7.4926	-4.3653	-4.3613	-4.3660
AR(2) (z test)	-1.1053	-1.1263	-1.1065	0.9522	0.9590	0.9508

Table 4: Short-term development of Islamic finance (Dynamic Panel Model)

A system estimator using additional moment conditions, where a lag of GDP growth, and first difference of three different Islamic finance variables, IS_{AT} , IS_{DEP} , and IS_{LIAB} on GDP growth, where SCH, INC, SAV, INV, TR, and INFL are used as control variables. Here, ΔIS_{AT} , ΔIS_{DEP} , and ΔIS_{LIAB} represent growth in relative market share of assets, deposits, and liabilities for Islamic banks. SCH represents the level of education, INC represents the level of development, SAV represents gross capital accumulation, INV represents gross capital formation, TR represents the effect of external sectors, and INFL represents macroeconomic stability.

4.2. Long-term analyses

Our long-term analyses follow the footsteps of Beck, Levine, and Loayza (2000), where they transform their data to analyze the effects of financial inclusion on growth. They transform their dataset by taking non-overlapping mean of observations over five-year periods and treat each of these five-year periods as one period for analysis. Such a transformation allows the use of simple and intuitive econometric techniques for long-term analyses. Moreover, it smoothens the extreme observations in a dataset.

Beck, Levine and Loayza (2000) smooth their data for five-year periods. However, our main focus in this study is developing or underdeveloped countries which have many missing variables before 1991, therefore we smooth our data over three-year periods. Given that we are using threeyear periods, the forecasting horizon for the growth innovation, which is an unanticipated component, extends about three years into the future. We average the data over 8 non-overlapping 3-year periods from 1991 to 2014.

We run a fixed effect model and a dynamic GMM model on these data as we did earlier. The results are reported in Table 5 and Table 6. Both the static and dynamic panel models show that Islamic finance measures are positively related to growth. The dynamic GMM model further shows that the effect of Islamic finance is more pronounced for the OIC subsample.

	Whole Samp	ole		OIC subsam	ple	
ΔΙS _{AT}	0.0004***			0.0003***		
	(0.0001)			(0.0001)		
ΔIS _{DEP}		0.0003***			0.0002***	
		(0.0001)			(0.0001)	
ΔIS _{LIAB}			0.0004***			0.0003***
			(0.0001)			(0.0001)
SCH	-0.0139	-0.0125	-0.0139	-0.0062	-0.0051	-0.0062
	(0.0113)	(0.0114)	(0.0113)	(0.0145)	(0.0147)	(0.0145)
INC	-0.0143*	-0.0144*	-0.0143*	-0.0059	-0.0045	-0.0059
	(0.0076)	(0.0076)	(0.0076)	(0.0139)	(0.0142)	(0.0139)
SAV	0.0093**	0.0095**	0.0093**	0.0069	0.0073	0.0068
	(0.0041)	(0.0041)	(0.0041)	(0.0092)	(0.0092)	(0.0092)
INV	0.0276***	0.0279***	0.0276***	0.0174	0.0176	0.0175
	(0.0070)	(0.0070)	(0.0070)	(0.0145)	(0.0146)	(0.0145)
TR	0.0002	0.0005	0.0002	-0.0075	-0.0063	-0.0075
	(0.0066)	(0.0066)	(0.0066)	(0.0135)	(0.0135)	(0.0135)
INFL	-0.0685**	-0.0681**	-0.0684**	-0.0573**	-0.0557*	-0.0571**
	(0.0295)	(0.0298)	(0.0295)	(0.0276)	(0.0281)	(0.0275)
α	0.0607	0.0560	0.0607	0.0347	0.0154	0.0350
	(0.0467)	(0.0468)	(0.0467)	(0.0858)	(0.0873)	(0.0859)
Ν	784	781	784	203	202	203
Countries	118	117	118	31	31	31
F-test	44.55	8.04	34.14	28.30	3.01	19.05
$\overline{\chi}^2$	49.33	50.6	49.22	7.71	8.34	7.69
χ^2	30.41	28.05	30.45	11.37	9.63	11.29
\mathbb{R}^2	0.0539	0.0558	0.0539	0.0992	0.1026	0.0991

Table 5: Long-term development of Islamic finance (Static Panel Model)

Panel regression using GLS estimator of first difference of three different Islamic finance variables, IS_{AT} , IS_{DEP} , and IS_{LIAB} on GDP growth, where SCH, INC, SAV, INV, TR, and INFL are used as control variables. The sample is averaged for three years starting from 1991. Here, ΔIS_{AT} , ΔIS_{DEP} , and ΔIS_{LIAB} represent growth in relative market share of assets, deposits, and liabilities for Islamic banks. SCH represents the level of education, INC represents the level of development, SAV represents gross capital accumulation, INV represents gross capital formation, TR represents the effect of external sectors, and INFL represents macroeconomic stability.

N is number of observations, $\bar{\chi}^2$ reports Breusch and Pagan Lagrangian multiplier test statistic, and χ^2 reports Durbin-Wu-Hausman test statistic.

	Whole Sample			OIC subsample			
GDPG _{t-1}	0.2567***	0.2576***	0.2565***	0.2008**	0.2035**	0.2001**	
	(0.0722)	(0.0722)	(0.0722)	(0.0942)	(0.0947)	(0.0942)	
GDPG _{t-2}	-0.1848***	-0.1852***	-0.1847***	-0.1829**	-0.1832**	-0.1831**	
	(0.0532)	(0.0532)	(0.0532)	(0.0870)	(0.0870)	(0.0869)	
ΔΙS _{AT}	0.0004***			0.0006**			
	(0.0002)			(0.0003)			
ΔIS _{DEP}		0.0003***			0.0005**		
		(0.0001)			(0.0002)		
ΔIS _{LIAB}			0.0004**			0.0006**	
			(0.0002)			(0.0003)	
SCH	-0.0521*	-0.0530*	-0.0522*	0.0160	0.0166	0.0158	
	(0.0280)	(0.0281)	(0.0280)	(0.0177)	(0.0179)	(0.0176)	
INC	0.0057	0.0062	0.0057	-0.0197***	-0.0202***	-0.0196***	
	(0.0090)	(0.0091)	(0.0090)	(0.0063)	(0.0064)	(0.0063)	
SAV	0.0052	0.0053	0.0051	0.0018	0.0026	0.0016	
	(0.0069)	(0.0069)	(0.0069)	(0.0114)	(0.0116)	(0.0114)	
INV	0.0283***	0.0281***	0.0283***	0.0159	0.0149	0.0161	
	(0.0093)	(0.0093)	(0.0093)	(0.0148)	(0.0152)	(0.0147)	
TR	0.0299***	0.0302***	0.0299***	0.0056	0.0072	0.0055	
	(0.0100)	(0.0100)	(0.0100)	(0.0186)	(0.0187)	(0.0186)	
INFL	-0.1101***	-0.1111***	-0.1098***	-0.1606**	-0.1669**	-0.1590**	
	(0.0394)	(0.0395)	(0.0394)	(0.0668)	(0.0688)	(0.0669)	
α	-0.1470**	-0.1507**	-0.1469**	0.0677	0.0647	0.0676	
	(0.0607)	(0.0610)	(0.0607)	(0.0705)	(0.0698)	(0.0704)	
N	665	664	665	173	173	173	
Countries	118	117	118	31	31	31	
Instruments	34	34	34	34	34	34	
Wald χ^2	105.09	105.43	103.98	45.74	46.05	45.50	
AR(1) (z test)	-4.4367	-4.4444	-4.4353	-3.1206	-3.1318	-3.1192	
AR(2) (z test)	0.2377	0.2561	0.2357	-0.3826	-0.3087	-0.3912	

Table 6: Short-term development of Islamic finance (Dynamic Panel Model)

A system estimator using additional moment conditions, where two lags of GDP growth, and first difference of three different Islamic finance variables, IS_{AT} , IS_{DEP} , and IS_{LIAB} on GDP growth, where SCH, INC, SAV, INV, TR, and INFL are used as control variables. The sample is averaged for three years starting from 1991. Here, ΔIS_{AT} , ΔIS_{DEP} , and ΔIS_{LIAB} represent growth in relative market share of assets, deposits, and liabilities for Islamic banks. SCH represents the level of education, INC represents the level of development, SAV represents gross capital accumulation, INV represents gross capital formation, TR represents the effect of external sectors, and INFL represents macroeconomic stability.

Daly and Frikha (2016) and Imam, and Kpodar (2016) did somewhat similar analyses and report similar findings. Our findings show that the positive impact of Islamic finance is not just a country-specific phenomenon, but a general one. Overall, the results show positive impact of relative growth of Islamic finance on economic growth, except for the OIC subsample in short-term dynamic panel model.

4.3 Propensity Score Matching

We further estimate the treatment effect of Islamic finance on growth using a logistic model to predict the propensity scores of logarithmic values of GDP per capita using covariates SCH, INC, SAV, INV, TR, and INFL. We match with only the closest neighbor because matching with distant neighbors reduces variance at the expense of increased bias. We first test how being an OIC member corresponds to growth and how having Islamic banking corresponds to growth in the whole sample. The coefficients for matching treated and control subjects are reported under ATE and matching only treated are reported under ATET. The results are reported in Table 7.

		Ν	ATE	ATET
Whole Sample	OIC (1 v 0)	2662	-0.6789***	0.3849***
			(0.1093)	(0.1844)
	IB(1 vs 0)	2662	0.7472***	0.9238***
			(0.1283)	(0.1320)
OIC subsample	IB(1 vs 0)	677	0.3727***	0.5535***
			(0.1034)	(0.1566)

Table 7: Propensity Score Matching

Logit model treatment-effects estimation of OIC and Islamic Banking dummy variable on log(GDP) for the whole sample and OIC subsample. N is number of observation. The average treatment effect (ATE) takes the difference between observed and potential outcomes and uses the average of the difference. It estimates the effect of treatment on population. The average treatment effect on the treated (ATET) uses similar technique to estimate the effect of treatment on the treated.

We find that having Islamic finance improves the likelihood of higher GDP per capita. OIC countries, however, show a lower likelihood of GDP per capita when we match both treated and controls. So, we separate the OIC countries again to see how Islamic finance contributes to GDP per capita. We find that Islamic finance has a positive impact on GDP per capita.

4.4 Imputation of missing variables

The primary focus of this study is OIC countries. These countries have many missing observations. As an effort to minimize the effect of missing observations on our findings, we fill in the missing variables using an iterative Markov Chain Monte Carlo method. The number of observations replaced for each variable is reported in Table A1. Figure A1 and A2 show how well the estimates fare in terms of iteration number.

We run the same static and dynamic models to estimate short-term effects (Table 8 and 9) and long-term effects (Table 10 and 11) of the increase in relative strength of Islamic finance. However, we report the results of random effect GLS regression for OIC subsample in static panel models (Table 8 and 10). The Durbin-Wu-Hausman test statistics indicate that the random effect model produces efficient and consistent results for imputed OIC subsample.

	Whole sample (Fixed Effect)			OIC subsample (Random Effects)			
ΔIS _{AT}	0.0002**			0.0002**			
	(0.0001)			(0.0001)			
ΔIS _{DEP}		0.0003			0.0002		
		(0.0002)			(0.0002)		
ΔIS _{LIAB}			0.0002**			0.0002*	
			(0.0001)			(0.0001)	
SCH	0.0167*	0.0167*	0.0167*	0.0242***	0.0242***	0.0242***	
	(0.0094)	(0.0094)	(0.0094)	(0.0092)	(0.0092)	(0.0092)	
INC	-0.0095	-0.0096	-0.0095	-	-	-	
				0.0115***	0.0115***	0.0115***	
	(0.0072)	(0.0072)	(0.0072)	(0.0028)	(0.0028)	(0.0028)	
SAV	0.0090***	0.0090***	0.0090***	0.0060***	0.0060**	0.0060**	
	(0.0028)	(0.0028)	(0.0028)	(0.0031)	(0.0031)	(0.0031)	
INV	0.0268***	0.0268***	0.0268***	0.0206**	0.0207***	0.0206***	
	(0.0063)	(0.0063)	(0.0063)	(0.0055)	(0.0055)	(0.0055)	
TR	0.0063	0.0063	0.0063	-0.0031	-0.0032	-0.0032	
	(0.0059)	(0.0059)	(0.0059)	(0.0068)	(0.0068)	(0.0068)	
INFL	-0.0554***	-0.0557***	-0.0554***	-0.0147	-0.0154	-0.0146	
	(0.0141)	(0.0141)	(0.0141)	(0.0273)	(0.0278)	(0.0273)	
α	-0.0666	-0.0663	-0.0667	-0.0019	-0.0018	-0.0019	
	(0.0430)	(0.0430)	(0.0430)	(0.0288)	(0.0289)	(0.0288)	
Ν	3437	3437	3437	889	889	889	
Countries	154	154	154	41	41	41	
F-test (Wald χ^2)	9.52	9.40	9.44	(64.95)	(59.97)	(64.64)	
$\overline{\chi}^2$	435.99	435.71	435.98	70.01	69.98	69.96	
χ^2	24.17	22.93	24.18	8.76	8.73	8.75	
\mathbf{R}^2	0.1246	0.1249	0.1246	0.1107	0.1106	0.1106	

Table 8: Short-term development of Islamic finance using imputed data	(Static
Panel Model)	

Panel regression using GLS estimator of first difference of three different Islamic finance variables, IS_{AT} , IS_{DEP} , and IS_{LIAB} on GDP growth, where SCH, INC, SAV, INV, TR, and INFL are used as control variables. Here, ΔIS_{AT} , ΔIS_{DEP} , and ΔIS_{LIAB} represent growth in relative market share of assets, deposits, and liabilities for Islamic banks. SCH represents the level of education, INC represents the level of development, SAV represents gross capital accumulation, INV represents gross capital formation, TR represents the effect of external sectors, and INFL represents macroeconomic stability.

N is number of observations, $\bar{\chi}^2$ reports Breusch and Pagan Lagrangian multiplier test statistic, and χ^2 reports Durbin-Wu-Hausman test statistic.

	Whole Samp	le		OIC subsamp	le	
GDPG _{t-1}	0.2477***	0.2473***	0.2476***	0.1369**	0.1363**	0.1368**
	(0.0341)	(0.0341)	(0.0341)	(0.0640)	(0.0640)	(0.0640)
GDPG ₁₋₂	(,	(,	(0.0449	0.0458	0.0449
				(0.0302)	(0.0300)	(0.0302)
	0.0004***			0.0004***		
	(0.0002)			(0.0002)		
ΔIS _{DEP}		0.0004			0.0001	
		(0.0002)			(0.0003)	
			0.0004***			0.0003**
			(0.0001)			(0.0001)
SCH	0.0846***	0.0849***	0.0846***	0.0353	0.0351	0.0353
	(0.0295)	(0.0295)	(0.0295)	(0.0245)	(0.0245)	(0.0245)
INC	-0.0284***	-0.0285***	-0.0284***	-0.0191***	-0.0189***	-0.0191***
	(0.0089)	(0.0089)	(0.0089)	(0.0071)	(0.0071)	(0.0071)
SAV	0.0105**	0.0104**	0.0105**	0.0120**	0.0117**	0.0120**
	(0.0044)	(0.0044)	(0.0044)	(0.0049)	(0.0049)	(0.0049)
INV	0.0480***	0.0482***	0.0480***	0.0149	0.0154	0.0150
	(0.0100)	(0.0100)	(0.0100)	(0.0110)	(0.0110)	(0.0110)
TR	0.0000	-0.0002	0.0000	0.0041	0.0038	0.0040
	(0.0102)	(0.0102)	(0.0102)	(0.0139)	(0.0139)	(0.0139)
INFL	-0.0402**	-0.0409**	-0.0402**	-0.0417	-0.0431	-0.0417
	(0.0189)	(0.0189)	(0.0189)	(0.0485)	(0.0470)	(0.0486)
α	-0.0975**	-0.0969**	-0.0974**	0.0024	0.0024	0.0025
	(0.0488)	(0.0489)	(0.0488)	(0.0611)	(0.0611)	(0.0611)
Ν	3437	3437	3437	846	846	846
Countries	154	154	154	41	41	41
Instruments	307	307	307	306	306	306
Wald χ^2	112.40	109.78	112.06	49.07	44.26	49.68
AR(1) (z test)	-8.4431	-8.4476	-8.4436	-4.5820	-4.5865	-4.5817
AR(2) (z test)	-0.0892	-0.0695	-0.0892	1.0926	1.1194	1.0911

Table 9: Short-term determ	evelopment of Islamic finance	e using imputed data
	(Dynamic Panel Model)	

A system estimator using additional moment conditions, where a lag of GDP growth, and first difference of three different Islamic finance variables, IS_{AT} , IS_{DEP} , and IS_{LIAB} on GDP growth, where SCH, INC, SAV, INV, TR, and INFL are used as control variables. Here, ΔIS_{AT} , ΔIS_{DEP} , and ΔIS_{LIAB} represent growth in relative market share of assets, deposits, and liabilities for Islamic banks. SCH represents the level of education, INC represents the level of development, SAV represents gross capital accumulation, INV represents gross capital formation, TR represents the effect of external sectors, and INFL represents macroeconomic stability.

	Full Sample (Fixed Effects)			OIC subsample (Random Effects)			
ΔΙS _{AT}	0.0003			0.0000			
	(0.0003)			(0.0001)			
ΔIS _{DEP}		0.0002			0.0000		
		(0.0002)			(0.0001)		
ΔIS _{LIAB}			0.0003			0.0000	
			(0.0003)			(0.0001)	
SCH	0.0260*	0.0260*	0.0260*	0.0209***	0.0209***	0.0209***	
	(0.0150)	(0.0150)	(0.0150)	(0.0073)	(0.0073)	(0.0073)	
INC	-0.0154**	-0.0154**	-0.0154**	-0.0121***	-0.0121***	-0.0121***	
	(0.0073)	(0.0073)	(0.0073)	(0.0028)	(0.0028)	(0.0028)	
SAV	0.0114***	0.0112***	0.0114***	0.0056	0.0055	0.0055	
	(0.0033)	(0.0033)	(0.0033)	(0.0041)	(0.0040)	(0.0041)	
INV	0.0261***	0.0263***	0.0261***	0.0236***	0.0237***	0.0237***	
	(0.0061)	(0.0060)	(0.0061)	(0.0068)	(0.0067)	(0.0068)	
TR	0.0006	0.0006	0.0006	-0.0025	-0.0024	-0.0025	
	(0.0065)	(0.0065)	(0.0065)	(0.0059)	(0.0059)	(0.0059)	
INFL	-0.0540**	-0.0535**	-0.0540**	0.0000	0.0001	0.0001	
	(0.0219)	(0.0219)	(0.0219)	(0.0269)	(0.0267)	(0.0269)	
α	-0.0172	-0.0176	-0.0172	-0.0041	-0.0042	-0.0041	
	(0.0430)	(0.0429)	(0.0430)	(0.0256)	(0.0254)	(0.0256)	
Ν	1044	1044	1044	272	272	272	
Countries	154	154	154	41	41	41	
F-test (Wald χ^2)	11.72	11.65	11.72	178.84	140.78	138.56	
$\overline{\chi}^2$	76.51	76.65	76.49	17.32	17.41	17.31	
χ^2	12.97	12.05	13.01	2.82	2.76	2.82	
R ²	0.1246	0.1249	0.1246	0.2114	0.2115	0.2114	

Table 10: Long-term development of Islamic finance using imp	outed	data
(Static Panel Model)		

Panel regression using GLS estimator of first difference of three different Islamic finance variables, IS_{AT} , IS_{DEP} , and IS_{LIAB} on GDP growth, where SCH, INC, SAV, INV, TR, and INFL are used as control variables. The sample is averaged for three years starting from 1991. Here, ΔIS_{AT} , ΔIS_{DEP} , and ΔIS_{LIAB} represent growth in relative market share of assets, deposits, and liabilities for Islamic banks. SCH represents the level of education, INC represents the level of development, SAV represents gross capital accumulation, INV represents gross capital formation, TR represents the effect of external sectors, and INFL represents macroeconomic stability.

N is number of observations, $\bar{\chi}^2$ reports Breusch and Pagan Lagrangian multiplier test statistic, and χ^2 reports Durbin-Wu-Hausman test statistic.

	Whole Sample			OIC subsample			
GDPG _{t-1}	0.3220***	0.3221***	0.3220***	0.1924*	0.1916*	0.1923*	
	(0.0490)	(0.0490)	(0.0490)	(0.1091)	(0.1093)	(0.1090)	
GDPG _{t-2}	-0.1246***	-0.1247***	-0.1246***	-0.1191**	-0.1196**	-0.1191**	
	(0.0351)	(0.0351)	(0.0351)	(0.0493)	(0.0492)	(0.0493)	
ΔIS_{AT}	0.0004***			0.0004*			
	(0.0001)			(0.0002)			
ΔIS_{DEP}		0.0004***			0.0003		
		(0.0001)			(0.0002)		
ΔIS _{LIAB}			0.0004***			0.0004*	
			(0.0001)			(0.0002)	
SCH	0.0590*	0.0591*	0.0589*	0.1023***	0.1022***	0.1022***	
	(0.0317)	(0.0317)	(0.0317)	(0.0412)	(0.0412)	(0.0412)	
INC	-0.0183**	-0.0183**	-0.0183**	-0.0272**	-0.0273**	-0.0272**	
	(0.0075)	(0.0075)	(0.0075)	(0.0134)	(0.0134)	(0.0134)	
SAV	0.0089*	0.0090*	0.0089*	0.0066	0.0066	0.0066	
	(0.0053)	(0.0053)	(0.0053)	(0.0096)	(0.0096)	(0.0096)	
INV	0.0266**	0.0266**	0.0266**	0.0264	0.0263	0.0264	
	(0.0123)	(0.0123)	(0.0123)	(0.0192)	(0.0193)	(0.0191)	
TR	0.0281**	0.0282**	0.0280**	0.0093	0.0098	0.0092	
	(0.0117)	(0.0116)	(0.0117)	(0.0162)	(0.0163)	(0.0162)	
INFL	-0.1157***	-0.1163***	-0.1155***	-0.0388	-0.0393	-0.0382	
	(0.0333)	(0.0333)	(0.0333)	(0.0878)	(0.0892)	(0.0877)	
α	-0.1768***	-0.1774***	-0.1768***	-0.0939	-0.0958	-0.0939	
	(0.0599)	(0.0600)	(0.0599)	(0.1172)	(0.1170)	(0.1171)	
Ν	890	890	890	231	231	231	
Countries	154	154	154	41	41	41	
Instruments	34	34	34	34	34	34	
Wald χ^2	220.19	191.35	221.36	88.31	93.21	88.30	
AR(1) (z test)	-5.2016	-5.2059	-5.2017	-2.9594	-2.9635	-2.9595	
AR(2) (z test)	-0.3527	-0.34628	-0.3539	0.7359	0.7332	0.7353	

Table 11: Short-term development of Islamic finance using imputed data
(Dynamic Panel Model)

A system estimator using additional moment conditions, where two lags of GDP growth, and first difference of three different Islamic finance variables, IS_{AT} , IS_{DEP} , and IS_{LIAB} on GDP growth, where SCH, INC, SAV, INV, TR, and INFL are used as control variables. The sample is averaged for three years starting from 1991. Here, ΔIS_{AT} , ΔIS_{DEP} , and ΔIS_{LIAB} represent growth in relative market share of assets, deposits, and liabilities for Islamic banks. SCH represents the level of education, INC represents the level of development, SAV represents gross capital accumulation, INV represents gross capital formation, TR represents the effect of external sectors, and INFL represents macroeconomic stability.

Short-term analyses in Tables 8 and 9 show that improvement in relative strength of Islamic assets and liabilities contributes to growth in the short run. However, the static panel technique in Table 10 fails to find any significant relationship of Islamic finance and growth in the long-run. The dynamic model shows very significant positive impact of Islamic finance on growth for the whole sample. The Islamic asset and liabilities are barely significant (10% level) in OIC subsample and show positive impact on growth.

5. Conclusion

This study empirically shows that the presence of stronger Islamic finance contributes to long-term economic growth. The study considers that countries with Islamic finance are usually developing or underdeveloped and such countries usually experience higher GDP growth than their developed counterparts. So, it uses a number of well-established control variables and econometric techniques to reach the conclusion. One possible avenue Islamic finance is contributing towards economic growth could be financial inclusion.⁶ However, identifying the ways Islamic finance contributes to economic growth would be off-scope for this study. We leave such studies for future research.

We conclude by saying that Islamic finance can help increase economic growth. However, the countries covered in this study are mostly developing and underdeveloped nations who may be experiencing a large amount of growth, and the data was hard to come by since such countries lack data. There is no Islamic financial development index, which would have been useful to truly study the effects of Islamic finance in this region, and may be an idea for future research.

⁶ Beck, Demiriguc-Kunt and Levine (2004) report the positive role of Islamic finance on development and poverty alleviation.

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Appendix A

Variable	Complete	Incomplete	Imputed	Total
GDPG	3543	53	53	3596
SCH	2996	600	600	3596
INC	3555	41	41	3596
SAV	3365	231	231	3596
INV	3382	214	214	3596
TR	3484	112	112	3596
INFL	3453	143	143	3596
IS _{AT}	3552	44	44	3596
IS _{DEP}	3527	69	69	3596
IS _{LIAB}	3552	44	44	3596

Table A1: Imputation

This table reports multivariate imputation using 3000 iterations. Incomplete column reports the number of missing observations in each variable and Imputed column reports the number of missing observations replaced using an iterative Markov Chain Monte Carlo method.

Figure A1: Estimates of Worst Linear Function with respect to the iteration number







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Tourism Competitiveness Performances of the Most Visited Muslim-Majority Countries through Multi-Dimensional Scaling

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ABSTRACT

Competitiveness has become a vital issue for tourism destinations, which provides destinations a high ground to strengthen their positions in the marketplace and benefit more from the positive impacts of tourism, as well as preserving the resources. In this study, tourism and travel competitiveness performances of the ten most-visited Muslim-majority countries are examined comparatively by using the data issued by World Economic Forum's Competitiveness Indexes. The study aims to determine the power and the directions of the sub-competitiveness factors as well as reveal the differences among those countries, benefiting from both Multidimensional Scaling Analysis and ANOVA, which are employed together. Findings indicate that Infrastructure Index shows the highest correlation with the Overall Competitiveness Index, followed by the T&T Policy-Enabling Condition index. On the other hand, the correlations between Enabling Environment and T&T Policy Enabling Conditions and, Enabling Environment and Natural-Cultural Resources is found to be negatively correlated which provides a vital issue for practitioners.

ملخص

أصبحت القدرة التنافسية مسألة حيوية للوجهات السياحية، مما يوفر للوجهات أرضية عالية لتعزيز موقعها في السوق والاستفادة بشكل أكبر من الآثار الإيجابية للسياحة، فضلا عن الحفاظ على الموارد. وفي هذه الدراسة، يتم استكشاف الأداء التنافسي للسياحة والسفر في الدول العشر

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الأكثر زيارة ذات الأغلبية المسلمة بشكل مقارن باستخدام البيانات الصادرة عن مؤشرات التنافسية الصادرة عن المنتدى الاقتصادي العالمي.وتهدف إلى تحديد قوة واتجاهات عوامل التنافسية الفرعية وكذلك الكشف عن الاختلافات بين تلك البلدان، والاستفادة من كل من تحليل القياس متعدد الأبعاد وتحليل التباين الأحادي (ANOVA)، اللذين يتم توظيفهما معا. وتشير النتائج إلى أن مؤشر البنية التحتية يظهر أعلى ترابط مع مؤشر التنافسية العامة، يليه مؤشر الظروف التمكينية لسياسات السياحة والسفر. وفي المقابل، تم العثور على العلاقات بين البيئة التمكينية وشروط تمكين سياسات السياحة والسفر والبيئة التمكينية والموارد الطبيعية الثقافية لتكون مترابطة بشكل سلى، الأمر الذي يوفر مسألة جوهرية للممارسين.

ABSTRAITE

La compétitivité est devenue une question vitale pour les destinations touristiques. Elle offre aux destinations une base solide pour renforcer leur position sur le marché et profiter davantage des impacts positifs du tourisme, tout en préservant les ressources. Dans cette étude, les performances en matière de compétitivité du tourisme et des voyages des dix pays à majorité musulmane les plus visités sont examinées de manière comparative en utilisant les données publiées par les indices de compétitivité du Forum économique mondial. L'étude vise à déterminer la puissance et les directions des facteurs de souscompétitivité ainsi qu'à révéler les différences entre ces pays, en bénéficiant à la fois de l'analyse d'échelle multidimensionnelle et de l'ANOVA, qui sont utilisées conjointement. Les résultats indiquent que l'indice d'infrastructure présente la corrélation la plus élevée avec l'indice de compétitivité globale, suivi de l'indice des conditions favorables à la politique de T&T. D'autre part, les corrélations entre l'environnement favorable et les conditions favorables de la politique T&T, ainsi que l'environnement favorable et les ressources naturelles et culturelles, sont négativement corrélées, ce qui pose un problème vital aux praticiens.

Keywords: Tourism Competitiveness, Religion, Muslim-Majority Countries, WEF Competitiveness Report, Multi-Dimensional Scaling

JEL Classification: Z32, L83, O14,

1. Introduction

The success of tourism destinations depends on their ability to compete with counterparts. The enormous growth in the tourism and travel industry through tourism revenues, tourism investments, and tourist numbers has resulted in intense competition in the marketplace. Hence, competitiveness is attributed as a vital issue to keep up with today's fierce environment (Augustin & Liaw, 2017). Along with a very large number of variables that affect the destination competitiveness (Crouch, 2011: 40), it involves dimensions such as environmental sustainability (Mihalic, 2000), safety and security, technological development (Ozcan, 2018), qualified human resource capacity (Dwyer & Kim, 2003), market ties and variety of tourism activities in the destination (Crouch & Ritchie, 1999). Competitiveness plays an important role for destinations through preserving natural and cultural resources, creating high-skilled job demand, enhancing residents' quality of life, sustaining a positive image of the destination, and providing value-oriented products to the tourism market. Therefore, competitiveness has become a significant phenomenon in tourism research as well as in practical implications (Dogru et al., 2021).

Different indicators has been developed to measure destination competitiveness and to compare sub-items that shape the overall competitiveness level (Olczyk, 2016). World Economic Forum's Travel&Tourism Competitiveness Index (TTCI) is one of the most known and widely used among them. The index measures competitiveness at the country level and provides comprehensive information regarding policies leading to the competitive development of tourism in the country (Augustin & Liaw, 2017: 1296). In this regard, the index informs countries to focus on their weaknesses to benefit more from the positive impacts of the tourism industry.

Religion and religiosity are fairly important factors impacting public policy and individual behavior and lifestyle. Many studies show that (Poria et al., 2003; Rehman & Askari, 2010) religion is one of the main agents that forms the cultures, lifestyle, perceptions, evaluations, and attitudes. Religion may also affect tourists' destination choices (Ghani, 2019: 27). Nevertheless, there are limited studies that research the link between religion and tourism supply conditions (Zamani-Farahani & Henderson, 2010; Nazmfar et al., 2019). The association of religion with tourism in the literature is bonded as large as faith and pilgrimage tourism (Poria et al., 2003; Giovine & Choe, 2019). Nevertheless, the role of religion on the tourism supply conditions, i.e. policy, planning, and implementation that shape the competitiveness ability, is not discussed and researched enough in the literature. Therefore, this study focusing on tourism competitiveness concerning the first ten most visited Muslimmajority countries listed as Turkey, Malaysia, United Arab Emirates,

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Saudi Arabia, Indonesia, Bahrain, Morocco, Egypt, Tunisia, and Kazakhstan (World Bank, 2020) are examined in terms of their travel and tourism competitiveness level, using WEF's competitiveness report. Besides, we aim to find out competitiveness positions and features of the Muslim-majority countries and to cluster them according to their similarities and discrepancies comparatively between 2008 through 2019. Moreover, revealing the directions of the relations between sub-indexes of competitiveness edge for the most visited Muslim-majority countries is another important aspect of the research.

2. Literature Review

Religion can be linked with tourism as a supply-side in terms of macro and micro levels. Macro-level can be framed as policy and planning issues, the types and content of the products such as casino tourism, halal tourism, etc., and some rules for women tourists or prioritization of the tourism and relationship between the tourist and local communities. Religion influences the supply side on a micro level, such as the types and contents of hotel services, foods, drinks, ingredients, and service procedures. Nonetheless, in some countries, tourism is discouraged due to the influence of beliefs and local traditions (Uriely & Reichel, 2000; Poria et al., 2003). Religion is also linked with the attractions and environment in an area, stated as pull factors in tourism such as temples, churches, monuments, mosques, ceremonies, landscape, and other rituals.

Muslim and Islamic words or descriptions are sometimes used for the same meaning. The Islamic world can be used to mean three different aspects related to people who practice Islam, cultural meaning and geographical meaning, respectively. On the religious meaning, the Islamic world refers to Muslims and individuals who believe and practice Islam. In terms of culture, it refers to Islamic civilization. As the geographic meaning, refers to the countries Muslims make up the majority of the country's population. Islam is one of the widely practiced religions with a population of over 1.8 billion people across the world, representing 24.1% of 7.3 billion (2015), nearly one out of every four people in the World (Jafari & Scott, 2014; WorldAtlas, 2021).



Map 1: World Distribution of Islam

Source: Wikimedia, 2021

There are fifty-seven states as members in the Organization of Islamic Cooperation (OIC) spread over four continents (Organization of Islamic Cooperation [OIC], 2021). Tourism in Islamic countries with few exceptions is still in its infancy phase, the majority of them thus ignored the economic contribution of the tourism industry (Mansfeld & Winckler, 2008). Nevertheless, some of the Muslim-majority countries are fairly popular in world tourism markets such as Turkey, Malaysia, United Arab Emirates, and Egypt due to designating the tourism industry as an important sector for the country and adapting to the world tourism market by promoting their natural and cultural resources. The majority of markets of these countries are based on European and neighborhood countries except Saudi Arabia because of its holy places attracting just Muslim pilgrimages all around the world.

2.1. Tourism Performance of the ten Most-Visited Muslim-Majority Countries

Turkey is the most popular tourist destination among the Muslim-majority countries and it was ranked as the 6th most visited country in the world with its 51 million visitors in 2019 (UNWTO, 2020). Turkey's main advantages could be listed as being a secular country, having long sandy coasts by the Mediterranean Sea, geographical location between two continents, rich cultural and historical resources, and well-developed tourism institutions and infrastructure. Some of the main challenges the

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country faces recently are increased security problems, a low level of prioritizing of travel and tourism, and sustainability issues. In Turkey, the total contribution of travel and tourism to GDP was 11.3% and the total contribution of travel and tourism to employment was 2.6 million jobs which cover 9.4% of total employment in 2019 (World Travel Tourism Council [WTTC], 2020).

Malaysia is spread out at a peninsula that is located between the South China Sea and Bengal Bay of the Indian Ocean. The country has rich cultural and natural diversity and is known for having hospitable local people. Although the Malaysian state declares Islam as the official state religion, the government spends great effort to balance religious rules and tourism industry needs. Therefore, the country is considered a comparatively moderate and tourism-friendly destination. Nevertheless, gender inequality, insufficient coastal resource management, and a low level of environmental sustainability can be expressed as the main challenges. In the country, the total contribution of travel and tourism was 11.5% of GDP and, the total contribution of travel and tourism to employment was 2.2 million jobs which generates 11.8% of total employment in 2019 (Henderson, 2003; Malaysia, 2020; WTTC, 2020).

Like most countries in the Middle East, United Arab Emirates (UAE) has been heavily dependent on oil resources which contributed to the 30% of UAE's GDP with a fairly rich country concerning a high per capita income. The tourism industry mostly benefited from the country's developed infrastructure. Abu Dhabi and Dubai as the locomotives of the UAE have been established as a wonderland on the earth with countless attractions from safaris in the desert to the biggest shopping mall in the world. Nowadays, UAE has been one of the fastest-growing tourist destinations including sun, sea, sand, sports, shopping, etc. with astonishing luxury hotels and restaurants. The total contribution of travel and tourism was 11.9% of GDP and, the total contribution of travel and tourism to employment was 745 thousand jobs which generate 11.1% of total employment in 2019 (Henderson, 2006; Michael et al., 2019; WorldAtlas, 2020; WTTC, 2020).

Saudi Arabia is located in the Arabian Peninsula which is declared as an Islamic state. Thus, it directly affect all forms of tourism issues such as development of tourism policy, and planning and destination management and marketing practices. Saudi Arabia is the birthplace of Islam and has

many holy places mainly located in Mecca and Medina which millions of pilgrimages visit every year. The main advantages of the country include some ancient sites, the natural scenery of desert, mountains, valleys, and Red Sea beaches and coastline. Some of the barriers that slow down tourism development are stated as strict rules and opposition to international tourism except hajj tourism and some strict rules stemmed from the Sharia law on clothing and drinking for foreign tourists. Besides, lack of international openness and the low level of environmental sustainability is another weakness of the country (Seddon & Khoja, 2003: 957; Zamani-Farahani & Henderson, 2010: 79). The total contribution of travel and tourism to employment was 1.4 million jobs which generates 11.2% of total employment in 2019 (WTTC, 2020).

Countries	*Inbound Tourist Numbers (000) (2019)	*International Tourism Revenue (\$ Millions) 2019	**UNESCO Cultural Heritage Sites (2019)	**UNESCO Natural Heritage Sites (2019)	**UNESCO Mixed Heritage Sites (2019)	***Population 2019 (Million)	****Muslim Population %
Turkey	51,747	42,350	16	-	2	83,4	99.8
Malaysia	26,101	22,199	2	2	-	31,9	61.3
United Arab	21,553	38,413	1	-	-	9,7	76.0
Emirates							
S. Arabia	20,292	19,849	5	-	-	34,2	100
Indonesia	16,107	18,404	4	4	-	270,6	87.2
Morocco	13,109	10,013	9	-	-	36,4	99.0
Egypt	13,026	14,256	6	1	-	100,3	90.0
Bahrain	11,061	3,860	2	-	-	1,6	73.7
Tunisia	9,429	2,683	7	1	-	11,6	99.1
Kazakhstan	8,515	2,922	3	2	-	18,5	70.2
Total	190,940	174,949	55	10	2	598,2	
Share of the	8%	9%	6,5%	4,7%	5,2%	7,7%	
world							

Table 1: Statistics of the Ten Most Visited Muslim-Majority Countries

Sources: *World Bank, 2020; **UNESCO, 2020; ***United Nations, 2020; ****World Fact Book, 2020

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The Kingdom of Bahrain, an island country, is a small Arab country governed by a monarchy located in the Persian Gulf situated between the Qatar peninsula and the North-Eastern Coast of Saudi Arabia. Despite its small geographical size, the tourism performance of Bahrain is quite impressive in terms of tourist arrivals and tourism receipts. Tourism is stated as a priority sector in the new development strategy. The major advantages of the country are highly developed shopping facilities in a tax-free environment, preserved cultural symbols and heritage, a relatively liberal and open society, being a relatively safe destination, and well-established tourism infrastructure. Major threats for tourism development are strong competition in the region, deterioration of the image of Arabs in the Western tourism markets, non-differentiated of the tourism products from region destinations, over-dependence on a single market that is largely dependent on Saudi market (26%), and some bans on selling and consumption in the hotel and restaurants (Mansfeld & Winckler, 2008, 237-248). The total contribution of travel and tourism was 13.3% of GDP and, the total contribution of travel and tourism to employment was 98.7 thousand jobs which generates 15% of total employment in 2019 (WTTC, 2020).

In Morocco, tourism is an important industry and the country is fairly keen to promote tourism development. The main products of the country attract tourists that are seaside resorts, desert routes, and cultural heritages. Besides, recently health tourism has been also developing in the country. Morocco developed a strategic plan titled "A Vision 2010" to attract over ten million tourists. In this plan, the tourism sector is seen as one of the main pillars of the economy. After its successful implementation, "Vision 2020" was extended and enhanced as a new version of the "Vision 2010" project has established (Garrido et al., 2016). The advantages of the country are underlined as 3,500 kilometers of attractive the Atlantic Ocean and the Mediterranean Sea coastline, mountains, cultural heritage, rich regional cuisine, positive image in the Western tourism markets, relatively stable political environment, and pleasant climate. Lack of qualified human resources and labor market, health and hygiene issues are remarked as the main weaknesses of tourism in the country (Yasin et al., 2011; Bouzahzah & El Menyari, 2013; Moroccan National Tourism Office, 2020). The total contribution of travel and tourism was 12.0% of GDP and, the total contribution of travel and tourism to employment was 1.3 million jobs which generates 12.4% of total employment in 2019 (WTTC, 2020).
Egypt has been a popular destination since the ancient ages. The country has a long and rich history, therefore, it is very popular in the world tourism market. Tourism in Egypt is largely based on archeological resources such as pyramids as well as natural and cultural resources like the Red Sea and deserts (Shaalan, 2005). Despite its strengths, the country has not been able to prevent fluctuations in tourist demand, due to the instability and conflicts in the region (Gray, 1998). An instability political environment, lack of safety and security, low level of the business environment, poor tourism infrastructure and service quality, lack of qualified human resources, and environmental sustainability are the challenges for the tourism development in the country. The total contribution of travel and tourism to employment was 2.4 million jobs which generates 9.7% of total employment in 2019 (WTTC, 2020).

Indonesia is a Muslim majority country, located mainly in Southeast Asia with some territories in Oceania. It is the largest archipelagic country in the world with more than 17,000 islands in total, about 6,000 of them are inhabited which are scattered over both sides of the equator and extending 5,110 km from east to west and 1,888 km from north to south. The country has natural resources with a unique combination of a tropical climate and thousands of islands with a long stretch of beaches (one of the longest coastlines in the world) and rich ethnic diversity and local cultures which tourism opportunities. Nevertheless. creates huge sorts of industrialization and urbanization for economic growth are the main threats that affect these sensitive areas. Inbound tourism is a significant part of the economy and is expected to be one of the major sectors. But political and economic instability impacts the tourist arrivals negatively (Walpole and Goodwin, 2000; Henderson, 200; Sugiyarto et al., 2003; Country Studies, 2021). The total contribution of travel and tourism was 5.7% of GDP and, the total contribution of travel and tourism to employment was 12.5 million jobs which generates 9.7% of total employment in 2019 (WTTC, 2020).

Tunisia is located in North Africa which is in the Maghreb and considers Islam as the official state religion. Tunisia has implemented fairly aggressive tourism investment policies to encourage foreign private investment and developed some political and economic reforms to be a competitive tourism destination and drawn up a new strategy in 2007 to expand, promote and diversify tourism products such as tourism in the

desert, cultural and heritage tourism, golf and health tourism. The suitable Mediterranean coastline and climate, history, and culture are the core of the Tunisian tourism product. Tunisian tourism was drastically affected by some terrorist attacks in 2015 and tourism receipts registered a decline of 47.6%. Political instability and safety and security issues at both regional and local levels are the main obstacles in the country (Poirier, 1995; Bouzahzah & El Menyari, 2013; Tourism Tunisia, 2020). The total contribution of travel and tourism was 13.9% of GDP and, the total contribution of travel and tourism to employment was 373.5 thousand jobs which generate 10.8% of total employment in 2019 (WTTC, 2020).

Kazakhstan, the largest of the Central Asian countries and the ninthlargest in the world, spread to stretches from the lower sides of the Volga River eastward to the foot of the Altai Mountains and from the Western Siberian lowland southward to the Kyzyl-Kum Desert. Kazakhstan's geography has been on the route of the Silk Road since ancient times and a significant number of heritages have survived on the territories of the country. After disintegration from the Soviet Union in 1991, the government tried to reconstitute the national traditions and renaissance of Kazakh nomadic folklore to restore eroded identity and image in the Soviet Union. The government positioned the country as a resourceful, stable, and multiethnic country on a crossroad between West and East, combining diverse cultures and beliefs (Kantarci, 2007a; Kantarci, 2007b; Marat, 2009; Tiberghien et al., 2014; Britannica, 2020). The development of the tourism industry in Kazakhstan started with organized trips socalled "shopping tours" from Almaty, the former capital, to Turkey, China, Emirates, and Pakistan" (Garkavenko & Tiberghien, 2014: 293). Unique nomadic culture, ancient Silk Road and rich historical heritage, unique natural assets, business environment and opportunities, diverse and rich ethnic traditions, and relatively stable political environment are the main advantages and attractions of Kazakh Tourism. The total contribution of travel and tourism was 5.2% of GDP and, the total contribution of travel and tourism to employment was 430 thousand jobs which generate 4.8% of total employment in 2019 (WTTC, 2020).

3. Data and Methodology

We investigated the ten most-visited Muslim-majority countries according to the data issued by the World Economic Forum (WEF) between 2008 through 2019. Those countries, in alphabetical order, are called Bahrain, Egypt, Indonesia, Kazakhstan, Malaysia, Morocco, Saudi Arabia, Tunisia, Turkey, and the United Arab Emirates. The shorthand forms of the countries are denoted by B, E, I, K, M, MO, SA, T, TR, and UAE, respectively. The data composes of four main indexes and one compound index called the overall index, which is a weighted representation of the four main indexes that are called the Enabling Environment Index composing of five attributes, T and T Policy-Enabling Conditions Index composing of four attributes, the Infrastructure Index consisting of three attributes and the Natural and Cultural Resources Index consisting of two attributes. Determinants of the competitiveness and its sub-indexes are shown in Table 2 below.

Enabling	T&T Policy and	Infrastructure	Natural and
Environment	Enabling Conditions		Cultural Resources
 Business 	 Prioritization of 	 Air Transport 	 Natural
Environment	Travel & Tourism	Infrastructure	Resources
 Safety and 	 International 	 Ground and 	 Cultural
Security	Openness	Port	Resources and
		Infrastructure	Business Travel
 Health and 	 Price 	 Tourist 	
Hygiene	Competitiveness	Service	
		Infrastructure	
 Human 	 Environmental 		
Resources and	Sustainability		
Labor Market			
 ICT Readiness 			

Table 2: Determinants of Competitiveness Index

When the data is compiled, we encountered an issue of the altered data structure since the WEF changed the recording methodology after 2011 so the data structure in 2013 and on is not the same as the previous ones. Hence, we adapted the data reported in 2011 and before the new data structure. Besides, the data for Tunisia in 2013 was fully missing. Hence, we employed the Expected Maximization (EM) algorithm to predict them by using the SPSS 24.0 version, so the missing values were substituted by the outputs of the EM algorithm.

4. Empirical Results

We start with the analysis calculating the correlations between the subindexes. The results are presented in Table 3 below.

Indexes	Overall Index	Enabling Environment Index	TT Policy- Enabling Conditions Index	Infrastructure Index	Natural- Cultural Resources Index
Overall	1	0.304	0.529	0.752	0.483
Enabling Environment Index		1	-0.371	0.613	-0.351
TT Policy- Enabling Conditions Index	S	S	1	-0.07	0.410
Infrastructure Index	S	S	S	1	0.021
Natural- Cultural Resources Index	S	S	S	S	1

 Table 3: Correlations between Indexes

S represents symmetry. Bold numbers denote statistically significant correlations at the 0.05 significance level.

The Overall index is correlated with all four indexes. While the highest correlation is 0.752 with the Infrastructure Index, the lowest correlation is 0.304 with the Enabling Environment Index. On the other hand, the correlation coefficients between Enabling Environment and T&T Policy-Enabling Conditions and Enabling Environment and Natural-Cultural Resources are -0.371 and -0.351, respectively. What they imply is that they have the opposite relations with the Enabling Environment Index. In other words, as long as the Enabling Environment index increases for the countries, both T&T Policy-Enabling and Natural-Cultural Indexes tend to decrease. Also, some correlation coefficients are found statistically insignificant between indexes, which are T and T Policy Enabling Conditions-Infrastructure and Infrastructure-Natural and Cultural Resources being -0.07 and 0.021, respectively.

The multivariate statistical method called Multi-Dimensional Scaling (MDS) is conducted to display those indexes on a two-dimensional graph. By doing so, how similar those indexes are and how they are related to the Overall Index can be exhibited graphically to provide a broader perspective with understanding the structure of the data in general. Multi-Dimensional Scaling is a multivariate statistical method used for

displaying high dimensional data on either a two-dimensional or threedimensional graph to examine the similarities or dissimilarities among observations or variables by keeping in mind that whenever high dimension is represented in either two or three dimensions, the loss of information should occur and this loss is expected to be as little as possible. The loss of information is measured by a statistic called stress value whose values less than 0.05 indicate a good fit for the original multidimensional data. The MDS employs various distance measures such as Euclidean Distance, Minkowski Distance, and so on to locate the variables or objects in either a two- or three-dimensional graph. Thus, objects or variables on a graph are assessed concerning distances that existed between them. In other words, assessments are conducted based on either similarity or dissimilarity. If the objects/variables are closer to each other, they are thought of as similar objects. Otherwise, they are called dissimilar (Tinsley & Brown, 2000). Figure 1 depicts the relation between indexes.





The generated MDS is composed of two dimensions where each dimension consists of two indexes. While Dimension 1 is represented by both T and T Policy-Enabling Conditions and Natural-Cultural Resources, Dimension 2 is characterized by both Infrastructure and Enabling Environment. The location of the Overall index close to the origin of the graph implies that it is almost represented equally by the two dimensions. The stress value, denoting how much information is lost when high dimensional data is shrunk to a lower dimension, for example, from 5 to 2 in our case, is 0.03864, which is less than 0.05 and indicates a good fit. Moreover, this representation can also be validated by running a factor analysis method with varimax rotation. The results are tabulated in Table 4.

	Factor 1	Factor 2
Overall	0.759	0.638
Enabling Environment	0.801	-0.470
Infrastructure	0.945	0.070
T&T Policy	-0.024	0.842
Natural-Cultural Resources	-0.017	0.816

Table 4: Factor Analysis Results of the Five Indexes

As Table 4 depicts, the Overall index with very close factor loadings in both factors, which are 0.759 and 0.638, are represented by the two factors called Factor 1 and Factor 2, respectively. While the Enabling Environment and Infrastructure indexes are represented by Factor 1 (Dimension 1 by the MDS), the T and T Policy-Enabling Conditions and Natural-Cultural Resources indexes are characterized by Factor 2 (Dimension 2 by the MDS). The total variance explained is 82.41 percent, which is statistically high.

When the Enabling Environment Index is a concern, it composes of five attributes. The representation of them on a two-dimensional graph generated by the MDS is presented in Figure 2. The stress value is 0.0023, which indicates a good fit. Figure 2 depicts the locations of the five attributes that compose the Enabling Environment Index.



Figure 2: The Representation of the Attributes of the Enabling Environment Index

While Dimension 1 is represented by the attributes of ICT-Readiness, Business Environment, and Safety-Security, Dimension 2 is characterized by the attributes of Health-Hygiene and Human Resources Labor Market. When the countries are displayed on a two-dimensional graph for each index assigning a title to each dimension is important since the interpretations of the locations of the countries should be provided concerning those dimensions. Hence, when the ten most visited Islamic countries are a concern for this index, the graph is presented in Figure 3. The MDS generates a graph composed of four regions containing the countries with year tags.

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As seen from Figure 3 that the two-dimensional graph generated by the MDS has four regions numbered from 1 to 4. While region 1 denotes relatively the worst location concerning two dimensions, region 3 expresses relatively the best location concerning two dimensions. On the other hand, while region 4 denotes the best location concerning dimension 2 (Health-Hygiene and Human Resources Labor Market), region 2 expresses relatively the best location concerning Dimension 1 (ICT-Readiness, Business Environment, and Safety-Security). Stress value, 0.00754, is attained, which indicates a good fit. Even though the locations of the countries in four different regions are generated by a statistical analysis called the MDS, we conduct another statistical test whether these partitions are statistically significant or not. For this purpose, we conduct the ANOVA analysis to compare those four regions. Table 5 denotes the results of the ANOVA for each attribute and the Enabling Environment Index.

Index and	Enabling	Business	Safety-	Health and	Human	ICT-
Attributes	Environment	Environment	Security	Hygiene	Resources	Readiness
	Index	Attributes	Attributes	Attributes	Labor Market	
Significance Level	0.00<0.05	0.00<0.05	0.00<0.05	0.00<0.05	0.00<0.05	0.00<0.05

Table 5: The Results of ANOVA

Table 5 implies that the four regions seen on a two-dimensional graph are statistically significant concerning both the Enabling Environment Index and its attributes that help interpret the locations of the countries. Therefore, we can conclude how those countries evolve between 2008 through 2019.

The objective of the research is to provide the best and worst performances of the ten most visited Islamic countries concerning those indexes between 2008 through 2019, which covers all available data since its dissemination.

It is observed from Figure 3 that Kazakhstan's performance concerning the Enabling Environment Index represented by two dimensions had been in a steady condition and relatively the best one among the countries since 2008 and it differed very much from the rest in this regard. On the other hand, Indonesia between 2011 through 2019 had relatively the worst performance among them even though it had been in a better position based on Dimension 2 between 2008 through 2009. When Dimension 2 (Health-Hygiene and Human Resources Labor Market) is a concern, most of the countries look like they did not make progress since 2013 except Egypt, Tunisia, and Turkey. On the other hand, countries such as Bahrain, Morocco, Saudi Arabia, and the United Arab Emirates had made progress between 2015 through 2019 on the attributes related to Dimension 1 (ICT-Readiness, Business Environment, and Safety-Security). Besides, Malaysia had moved to relatively the worst position between 2015 through 2019 even though it has been in a better position on Dimension 2.

When T and T Policy-Enabling Conditions Index is a concern, it composes of four attributes. The representation of them on a two-dimensional graph generated by the MDS resulting with a stress value of 0.00359, which indicates a good fit, is presented in Figure 4 which depicts the locations of the four attributes consisting of the T and T Policy-Enabling Conditions Index.

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Euclidean distance model

Figure 4 implies that while Dimension 1 represents International Openness, Price Competitiveness, and Prioritization of Travel and Tourism, Dimension 2 is characterized by Environmental Sustainability. When the countries are exhibited on a two-dimensional graph assigning a title to each dimension is important since the interpretation of countries should be given based on those dimensions. Hence, when the ten most visited Islamic countries are a concern for this index, the graph is depicted in Figure 5. The MDS with a stress value of 0.071 produces a graph composed of four regions containing the countries with year tags. Even though the stress value is a little larger than 0.05, it would not have an impact on affecting the reliability of the analysis.





As seen from Figure 5, the two-dimensional graph generated by the MDS has four regions numbered from 1 to 4. While region 1 denotes relatively the worst location concerning two dimensions, region 3 expresses relatively the best location concerning two dimensions. On the other hand, while region 4 denotes the best location concerning Dimension 2 (Environmental Sustainability), region 2 expresses the best location concerning Dimension 1 (International Openness, Price Competitiveness, and Prioritization of Travel and Tourism,). Stress value, 0.00754, is attained, which indicates a good fit. Even though the locations of the countries in four regions are generated by the MDS, we need to conduct another statistical test whether these partitions are statistically significant or not. For this purpose, we conduct the ANOVA analysis to compare those four regions. Table 6 denotes the results of the ANOVA for each attribute and T and T Policy-Enabling Conditions Index.

Table 6: The Results of ANOVA

Index and Attributes	T&T Policy Enabling Conditions	Prioritization of Travel and Tourism	International Openness	Price Competitiveness	Environmental Sustainability
Significance Level	0.00<0.05	0.00<0.05	0.00<0.05	0.00<0.05	0.00<0.05

Table 6 implies that the four regions seen on a two-dimensional graph are statistically significant concerning both the T and T Policy-Enabling Conditions Index and its attributes that help interpret the locations of the countries. Therefore, we can infer how those countries evolve between 2008 through 2019.

Observed from Figure 5 that there existed almost no countries performing well on both dimensions except for Malaysia and Bahrain covering just between 2015 through 2019. Most of the countries were more concerned with Dimension 2 (International Openness, Price Competitiveness, and Prioritization of Travel and Tourism). Other countries had been in a better position on Dimension 2 between 2015 through 2019. The worst performances had been contained just between 2008 through 2013 for the countries such as Morocco, Turkey, and the United Arab Emirates. It could be inferred that Environmental Sustainability had been widely overlooked for almost all countries though the attributes related to Dimension 2 (International Openness, Price Competitiveness, and Prioritization of Travel and Tourism) had been more preferred.

To avoid the repetitions over and over again regarding explanations, we present the last two findings briefly since we believe it is crystal-clear how we have presented our findings. Hence, after this point on, we provide figures and tables together and present our interpretation after them.

When the Infrastructure Index is a concern, it composes of three attributes. The representation of them on a two-dimensional graph generated by the MDS resulting in a stress value of 0.00147, which indicates a good fit, is presented in Figure 6 which depicts the locations of the three attributes composing the Infrastructure Index. Figure 6 implies that while Dimension 1 is represented by Ground and Port Infrastructure, Dimension 2 is characterized by Airport Transport Infrastructure and Tourist Service Infrastructure. Figure 7 displays the countries with year tags. Table 7 presents the results of the ANOVA.



Figure 6: The Representation of the Attributes of the Infrastructure Index

Figure 7: The Location of the Ten Muslim-Majority Countries Concerning Infrastructure Index between 2008 Through 2019



Index and Attributes	Infrastructure	Airport Infrastructure	Ground and Port Infrastructure	Tourist Service Infrastructure
Significance Level	0.246>0.05	0.005<0.05	0.044<0.05	0.001<0.05

 Table 7. The Results of ANOVA

Table 7 implies that the four regions observed on the two-dimensional graph are not statistically significant when the Infrastructure Index is singly a concern. However, when the attributes consisting of the Infrastructure Index are a concern, they are all statistically significant. Hence, their representation by the MDS can be utilized.

Turkey's performance had been in relatively the best position for the whole period except for 2008. In 2008, Turkey performed well concerning Dimension 1 (Ground and Port Infrastructure). While the worst performing countries were Malaysia, Morocco, and Bahrein with the different covering periods but they performed relatively worst before 2013. After that year most of the countries performed relatively well on either one of the dimensions. For example, while Malaysia had performed worse in the periods of 2008, 2009 2011, and 2015, Bahrein performed second worse in the periods of 2008, 2009, and 2013.

When the Natural and Cultural Resources Index is a concern, it composes of two attributes. Even though the two-dimensional representation of two attributes looks illogical, the correlation, 0.376, between those implies that their linear relationship is so weak that they can be represented by two dimensions. Hence, MDS is conducted resulting in a stress value of 0.00128. Figure 8 depicts two attributes on a two-dimensional graph. While Dimension 1 represents the Cultural resources, Dimension 2 expresses the Natural resources. Figure 9 displays the locations of the countries with year tags. Table 8 denotes the results of ANOVA.





Figure 9: The Location of the Ten Muslim-Majority Countries Concerning the Natural and Cultural Resources Index between 2008 Through 2019



Index and Attributes	Natural and Cultural Resources Index	Natural Resources Attributes	Cultural Resources Attributes
Significance Level	0.023<0.05	0.001<0.05	0.022<0.05

 Table 8: The Results of ANOVA

As seen from Figure 9 that Turkey's performance covering the period between 2008 through 2019 except for 2008 had been in a relatively better position among the countries. No other countries had it except for Morocco covering between 2008 through 2011. On the other hand, Malaysia had been one of the countries that should be paid attention to regarding natural resources since its performance has been better than other countries. On the other hand, some countries such as Indonesia, Kazakhstan, Saudi Arabia, United Arab Emirates, and Bahrein in different years had relatively worst performances.

5. Conclusion

We investigated the ten most visited Islamic countries using the data issued by the WEF that aggregates 14 pillars in four different indexes whose weighted combination leads to a compound index called the Overall Index. When the four indexes and the Overall Index are a concern, the leading index relating to the Overall index is called the Infrastructure index followed by TT Policy Enabling Conditions Index. The Natural and Cultural Resources Index is the third related one. However, the least related one is called Enabling Environment Index. Compatibly with the literature (Kasri & Wibowo, 2015; Knežević-Cvelbar et al., 2016), the result underlines the significant impact of the infrastructure on overall competitiveness and development. Thus, destinations should focus on their tourism infrastructure primarily to enhance their competitiveness ability.

When the relations between indexes are a concern, two pairs of indexes have opposite relations, which are called Enabling Environment and T&T Policy-Enabling Conditions and, Enabling Environment and Natural-Cultural Resources. This implies that as long as improvements are made regarding Enabling Environment, these could lead both TT Policy-Enabling and Natural and Cultural Resources to decrease. Thus, a prior examination should be done before conducting improvements on Enabling Environment since it could cause negative impacts on both T&T Policy-Enabling Conditions and Natural and Cultural Resources. Therefore, the result demonstrates a lack of holistic tourism development in the examined countries which negatively affects the overall competitiveness of the destinations.

By conducting MDS and ANOVA, the best and worst countries are relatively determined between 2008 through 2019, which covers the whole dataset issued by WEF. To summarize what we have found when the Enabling Environment Index is a concern, while Kazakhstan was relatively the best performer, Indonesia performed relatively the worst. Kazakhstan was the leading country among them and had been in a steady condition for the whole period. After 2013, no countries made a progress on Dimension 2 (Health-Hygiene and Human Resources Labor Market) except for Egypt, Tunisia, and Turkey. On the other hand, some countries made progress on Dimension 1 (ICT-Readiness, Business Environment, and Safety-Security), namely, Morocco, the United Arab Emirates, Saudi Arabia, and Bahrain between 2015 through 2019.

When T and T Policy-Enabling Conditions Index is a concern, Malaysia performed well in the period covering 2015 through 2019 as the best country and improved its position from where it had been from 2008 through 2013. On the other hand, no country at all performed worst from 2015 through 2019. However, it can be observed that most of the countries dealing with tourism overlooked Environmental Sustainability. Moreover, Kazakhstan and Bahrein shared similar best performances with Malaysia in 2019. Although Turkey was the worst performer between 2008 through 2013, Turkey reached a peak between 2015 through 2017. In 2019, Turkey dropped from where it had been previously. On the other hand, the worst performers existed before 2013 and the number of them is very few.

When the Infrastructure Index is a concern, Turkey's performance had been in the best position for the whole period except for 2008. In 2008, Turkey performed well concerning Dimension 1 (Ground and Port Infrastructure). While the worst performing countries were Malaysia, Morocco, and Bahrein with the different covering periods. For example, while Malesia had performed worse in the periods of 2008, 2009 2011, and 2015, Bahrein performed second worse in the periods of 2008, 2009, and 2013.

When Natural and Cultural Resources are a concern, Turkey's performance covering the period between 2008 through 2019 except for 2008 had been in a steady condition and positioned itself in a better place than other countries. Turkey shared its best position with Egypt in 2019. However, Indonesia performed worst in 2019 followed by Kazakhstan, Saudi Arabia United Arab Emirates, and Bahrein in 2017. On the other hand, Malaysia had been a leading country with a performance of natural resources in most of the period.

In conclusion, the ten most-visited Muslim-majority countries having different degrees of tourism experiences and activities share one common thing. They all overlook environmental sustainability and focus on attributes related to improving the business side of tourism such as ICT-Readiness, Business Environment, Safety-Security, and so on. Turkey leads those countries in both Infrastructure and Cultural and Natural resources followed by Malaysia and Egypt. Kazakhstan leads all countries in Enabling Environments, which implies that Kazakhstan had an attitude to improve its tourism. On the other hand, Indonesia looks like it had performed relatively worst among them. Besides, the efforts taken by those countries had not been steady since the fluctuations in their positions verified this.

The lack of a unified, integrated, and sustainable tourism policy is the main obstacle to stable tourism development in those countries. To overcome this problem, the destinations should increase the priority of tourism in their national policies, encourage competitiveness in tourism, increase cooperation between the public and private sectors, and develop international cooperation, including cooperation with OIC member countries as well.

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ABSTRACT

This study analyzes the relationship between foreign reserves accumulation on export and foreign direct investment both short and long-run for the period of 1980-2019. The total reserves minus gold has been utilized in analyzing the impact of foreign reserves accumulation on export and foreign direct investment in 11 Asian-African countries, namely Bangladesh, Ghana, India, Indonesia, Kenya, Nigeria, Pakistan, Philippines, Sri Lanka, Tunisia, and South Africa. Variables such as export, foreign direct investment, and gross fixed capital formation are examined using three methods of analysis: ARDL/PMG method, FMOLS method, and DOLS method, and allow for common correlated effects. The PMG, FMOLS, and DOLS estimations, respectively, show that foreign reserves accumulation has a significant and positive impact on export and foreign direct investment.

ملخص

تحلل هذه الدراسة العلاقة بين تراكم الاحتياطيات الأجنبية على الصادرات والاستثمار الأجنبي المباشر على المدى القصير والطويل لفترة 1980-2019. وتم استخدام إجمالي الاحتياطيات ناقص الذهب في تحليل تأثير تراكم الاحتياطيات الأجنبية على الصادرات والاستثمار الأجنبي المباشر في 11 دولة آسيوية أفريقية، وهي بنغلاديش وغانا والهند وإندونيسيا وكينيا ونيجيريا وباكستان والفلبين وسريلانكا وتونس وجنوب أفريقيا. ويتم فحص المتغيرات مثل التصدير والاستثمار الأجنبي المباشر وتكوين رأس المال الثابت الإجمالي باستخدام ثلاث طرق للتحليل: طريقة لوحة الانحدار الذاتي للإبطاء الموزع (ARDL)/ الجموعة المتوسطة المجمعة (PMG)، وطريقة المربعات الصغرى المعدلة بالكامل (FMOLS)، وطريقة

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المربعات الصغرى الديناميكية (DOLS)، وتسمح بالتأثيرات المترابطة الشائعة. وتظهر تقديرات PMG و FMOLS و DOLS، على التوالي، أن تراكم الاحتياطيات الأجنبية له تأثير هام وإيجابي على التصدير والاستثمار الأجنبي المباشر.

ABSTRAITE

Cette étude analyse la relation entre l'accumulation des réserves étrangères sur les exportations et les investissements directs étrangers à court et à long terme pour la période entre 1980-2019. Les réserves totales moins l'or ont été utilisées pour analyser l'impact de l'accumulation des réserves étrangères sur les exportations et les investissements directs étrangers dans 11 pays d'Asie et d'Afrique, à savoir le Bangladesh, le Ghana, l'Inde, l'Indonésie, le Kenya, le Nigeria, le Pakistan, les Philippines, le Sri Lanka, la Tunisie et l'Afrique du Sud. Les variables telles que l'exportation, l'investissement direct étranger et la formation brute de capital fixe sont examinées à l'aide de trois méthodes d'analyse : la méthode ARDL/PMG, la méthode FMOLS et la méthode DOLS, et tiennent compte des effets corrélés communs. Les estimations PMG, FMOLS et DOLS, respectivement, montrent que l'accumulation de réserves étrangères a un impact significatif et positif sur les exportations et les investissements directs étrangers.

Keywords: Panel data, export, FDI, foreign reserves accumulation, developing countries

JEL Classification: C23, F10, F23, F31, O50

1. Introduction

The persistent depreciation of foreign exchange rates and the accumulation of large foreign reserves have been considered crucial elements in fostering foreign trade and foreign direct investment, thereby achieving economic growth. A hefty foreign reserves accumulation is purposely to depreciates the real exchange rate for export promotion. In this context, the mechanism of export promotion is a profound argument for foreign reserves accumulation. Accumulating reserves depreciates the real exchange rate, which drives a shift in domestic production to the tradable sector. The foreign reserves accumulation will attract FDI into the tradable sector, which leads to higher productivity gain and economic growth. In addition, the foreign reserves accumulation has been regarded as a self-reliant economy, which by large foreign reserves holding can

finance the economy and mitigate external borrowing. In the long-run, support a country in minimizing the impacts of economic downturn and facing the volatility of international capital.

However, although all these arguments are well acknowledged, the social costs of holding foreign reserves remain the main argument for doubting foreign reserves accumulation in developing countries. This argument ties in with the cost borne on the economy. The cost bear from foreign reserves holding is due to non-interest payment on a large part of the foreign cash reserves and gold holdings. Thus, the good or bad for a country to accumulate foreign reserves depend on what a country has done with foreign reserves accumulation.

This paper begins the discussion with a brief overview of the selected countries. The selected countries are prominent in the world economy. The market and international institutions hold strong beliefs that the countries become some of the world's largest economies in the 21st century. Indonesia, India, and South Africa are known as the member of G20. Bangladesh, Pakistan, the Philippines, and Nigeria are members of the Next Eleven Countries.

In addition, Kenya is a major regional player in East Africa and one of the fastest-growing economies in Africa (World Bank, 2017). Ghana is one of the best trade destinations for foreign investment and trade in Africa and the fastest-growing economy in the world (World Bank, 2011). Sri Lanka is among the highest in terms of human development and social indicators in South Asia and favorably compared with other middle-income countries (World Bank, 2017). Tunisia is a rich country in human and physical capital and one of the fastest-growing and competitive economies in the Middle East and North Africa (MENA).

The statistics of foreign reserves accumulation, foreign trade, and FDI over the past four decades in developing countries are plotted in consecutive three figures. Figure 1 exhibits the trend of foreign reserves accumulation in 11 developing countries. India, Indonesia, and the Philippines are the countries with the hefty foreign reserves accumulation (FRA) compare to the other developing countries. South Africa showed an upward trend in FRA during 1980-2012. The FRA slightly decline in 2013 and 2015, then move a very slight increase during 2016-2019.





Source: World Bank Indicator Database (2021).

Additionally, Nigeria experienced increases in FRA in most of the years during 1980-2008. The FRA showed a downward trend since 2009, moving upward during 2016-2017, but declined in most recent years. Bangladesh recorded increases in FRA during 1980-2016 and quite static between 2017 and 2019. Pakistan experienced a shallow upward trend in FRA during 1980-2007 Bangladesh recorded stable increase in FRA during 1980-2016, and rather static between 2017 and 2019.

Figure 2 plots the export performance in the developing countries. India experienced an upward trend in export during 1980-2012. The export declined between 2013-2014, increased between 2015 and 2017, and decreased in 2018 and 2019. Indonesia recorded increasing exports during the period 1980-2010. Incidentally, South Africa has shown an export trend very similar to Indonesia during 2002-2019. South Africa experienced a shallow upward trend in export during 1980-1997, a slight

decrease in export in 1998 and 1999 and then a very slight increase in 2000 and 2001.



Figure 2: Export volume (in million USD, 1980-2019)

In addition, a slight upward trend in export was exhibited in Philippines over period 1980-2019. Nigeria recorded an increase in exports in most of the years during 1980-2006. Nigeria experienced export fluctuations in subsequent years, recording the highest increase in exports in 2012 and the lowest exports in 2016. Bangladesh showed a shallow upward trend in export during 1980-2019. Ghana and Sri Lanka also recorded slight increases in export during 1980-2010. Tunisia recorded a slight increase in export in most years during 1980-2008. The export declined slightly in 2009 and fluctuated at relatively low levels during 2010-2019. Kenya performed the lowest export among 11 developing countries during this period. Alongside the export expansion, the paper reveals the importance of FDI in developing countries.

Figure 3 presents the FDI in India and Indonesia was much higher than in other countries. India experienced an upward trend in FDI until 2008, decreased during 2009-2012, before moving up and reaching the highest

Source: World Bank Indicator Database (2021).

level in 2019. Indonesia recorded an upward trend in FDI during the 1980s and some years in the 1990s. The FDI decline to below zero levels from 1999 to 2001 before recovering to an upward trend in subsequent years. The FDI declined during 2014-2016, then increased upwards and reached its highest level in 2019. Nigeria experienced increases in FDI during 1980-2008. The fall in FDI started in 2009, increased slightly in 2010, and trended downwards between 2011 and 2019.



Figure 3: Foreign direct investment (in million USD, 1980-2019)

Source: World Bank Indicator Database (2021).

Furthermore, South Africa recorded ups and downs in the FDI during 1980-2019. The Philippines experienced an increasing trend in FDI over time but a slight decrease between 2017 and 2019. Ghana also recorded a shallow increase trend in FDI, quite similar to Bangladesh and Pakistan. Meanwhile, the FDI inflow in Tunisia and Sri Lanka recorded lower than others.

This study does also considers government spending on infrastructure development. The developing countries have liberalized their trade and FDI policies and pursued infrastructure development to support the industrial sector and attract FDI inflow, and maximize the benefits of foreign presence in the domestic economy. Factors that affect human capital and capital investment are associated with economic capacity and growth. The effects of infrastructure development on economic activity and economic growth are well-reported in several studies (Barro, 1990; Agenor, 2006; Agenor & Moreno-Dodson, 2006).

Based on the pros-cons arguments discussed earlier and the countries' background, we undertake a further investigation on the impacts of foreign reserves accumulation on export and FDI in 11 Asia-Africa countries. This study is complementary to similar papers by providing new findings from a combination of Asia and African countries, as such analysis has been addressed intensely in the literature. Furthermore, in this paper, we postulate that the effects of foreign reserves accumulation on the macroeconomic performance indicators will provide some insights to explain expansion opportunities and economic growth. As the selected countries are most promising among developing countries and attractive for trade and FDI, they are interesting to be analyzed in seeing the contribution of foreign reserves accumulation on the economy.

The paper is structured as follows. Section 2 presents the literature review. Section 3 explains the data, model specification, and method of analysis. The empirical results of the study are discussed in Section 4. Lastly, Section 5 presents the conclusions and policy consideration can be implemented for the developing countries.

2. Literature Review

The conventional wisdom says that trade and FDI are the engines of economic growth. Highlighting the pivotal roles of foreign reserves accumulation, whether it is for a buffer for liquidity needs, smoothing of exchange rate volatility, and maintaining the countries' confidence level, the foreign reserves accumulation matters for the economy. The IMF (2004) emphasized the roles of foreign reserves accumulation is aimed to (1) facilitate the monetary and exchange rate policy and intervention (2) hedge the countries from external vulnerability by maintaining foreign currency liquidity to absorb shocks during economic downturns and crises or when access to borrowing limited, and (3) maintain a level of confidence to markets that a country can meet its external obligations. The points are related to each other and affect the performance of exports and

FDI. They are frequently highlighted in the literature, as will be discussed in this section.

The underlying justification for point (1) is that reserve accumulation depreciates the real exchange rate, stimulates international trade, and attracts foreign direct investment (FDI) inflows. In addition, foreign reserves holding allows the country to shield the economy from the balance payment instability. Dooley et al. (2003) stated that foreign reserves accumulation intended to protect the local industrial sector by interfering with imports and promoting exports. Aizenman and Lee (2005) viewed foreign reserves accumulation as an instrument for effective exchange rate management, such as maintaining a low exchange rate to promote international competitiveness and trade. Genberg et al. (2005) posited that the holding of foreign exchange reserves in Asian countries ties in directly with the US dollar intended to undervalue the exchange rate to foster export competitiveness. Benigno and Fornaro (2012) posited an increase in foreign reserves holding leads to real exchange rate depreciation, which fosters tradable sectors toward export expansion. Besides, Benigno and Fornaro (2012) argued that foreign reserves are used to internalize the externalities in tradable sectors and provide liquidity to the corporate sector during financial distress.

The importance of foreign reserves on export and FDI in developing countries has been identified in several empirical studies. Carvalho and Fry-McKibbin (2014) posited countries accumulate foreign reserves to support the export promotion strategies and promote capital and productivity capacity by influencing exchange rate and signaling relative economic strength. Similarly, Polterovich and Popov (2003) and Cruz and Kreisler (2008) found foreign reserves stimulate economic growth through capital productivity and aggregate demand. Furthermore, in regard to point (2), Matsumoto (2019) posited foreign reserves accumulation drives economic growth by attracting FDI inflows and minimizing the sudden stops often associated with private external debt and working capital financing. Additionally, the countries accumulate foreign reserves to get more liquidity in the event of a crisis that isolating them from the international capital markets and blocking the situation triggers the capital flights (Aizenman et al., 2004; Obstfeld et al., 2008).

The hefty foreign reserves permits a country to withstand the recurrent boom-bust cycles in capital inflow, as well as massive speculative and capital flight. This idea relates foreign reserves accumulation directly to mitigate the sudden stops, capital flight, and exchange rate volatility. Catao and Milesi-Ferretti (2014) discussed that large foreign reserves holding minimizes the likelihood of external crises, which tend to occur in countries with a low foreign reserves accumulation. Most empirical studies conclude that the developing countries stockpile foreign exchange reserves to reduce the probability of falling into a crisis (Milesi-Ferretti & Razin, 2000; Calvo et al., 2008; Dominguez et al., 2011).

Finally, the stockpiling of large international reserves reflects the credibility of a country. Archer and Halliday (1998) identified the reasons why countries hold international reserve to include exchange rate targeting, foreign exchange market stability, credit worthiness, transaction buffer, exchange rate stability and emergency. By creating a credit worthiness through building up international reserve, the countries limit financial risk and minimize the impact of debt crisis. International reserve accumulation is proved to be growth-enhancing if only the debt flows are controlled. Assuming a self-reliance economy by mitigating debts (public and external debts), inducing higher level of international reserve is needed for boosting economic growth. It is because more debts would expose the country to volatile international capital and more international reserve will finance economic growth.

As external debt constitutes the profound source of economic financing in developing countries, debt is an instrument to finance infrastructure and public investment for fostering economic growth. However, in the longrun, the debt ties in with financial risks and debt crisis, not only in developed countries but also in developing countries. In this regard, mitigating debts is much wiser, and the hefty international reserve accumulation is much safer than borrowing. The large foreign reserves holding signalize creditworthiness and mitigate the external debt impact. Thus, it will attract more FDI. Elhiraika and Ndikumana (2007) believed that maintaining adequate reserves can boost investors' confidence and enhance investment and growth. Meanwhile, Cheng (2013) showed emerging market economics with a large stock of international reserves experience fast economic growth and suggested that holding reserves were part of economic catch-up strategies.

In case of financial distress, the foreign reserves serves as a veritable source of funds for external payments and liquidity to the trade sector.

The roles of foreign reserves accumulation in providing liquidity during crises amplify the positive impact of foreign reserves accumulation on growth. Taking some lessons from the previous economic downturns, the economists view that the accumulation of international reserves will be all the more significant. If the foreign reserves are treated as an isolated issue, trade and investment are difficult to generate and unlikely to achieve economic growth. The aforementioned has highlighted that the role of international reserve in coping with crisis and contingencies is in principle also to understand the key points linking foreign exchange reserves with trade, foreign direct investment, and economic growth.

3. Data and Methodology

3.1 Data

This study analyzes two main relationships in the long-run for a panel of eleven developing countries (N = 11) with annual data during 1980-2019 (T = 40). We analyze by using data from the World Bank Indicator. A set of variables are selected, and we define export (EXP) by the sum of export of goods and services. The foreign direct investment (FDI) represents the sum of investment flow into the host countries. We measure gross domestic product (GDP) by the sum of value added by all its producers. Meanwhile, foreign reserves accumulation (FRA) is measured by the total amount of foreign reserves minus gold. We represent infrastructure development (INFRA) by the gross fixed capital formation and defined by the sum of investment in infrastructure, investment in health, and investment in education, but not including labor costs. Our paper does not include gold holding but focuses on the total reserve minus gold to isolate the channel of the potential social effect on non-interest rates returns for gold holding. Each variable is measured in terms of the ratio of GDP as used in many empirical studies.

3.2 Model Specification

Panel data analysis is conducted to captures the information on both the intertemporal dynamics and individuality of the entities. i.e., to control unobservable characteristics and to give more reliable information (Baltagi and Kao, 2000; Hsiao, 2006). Based on Elhiraika and Ndikumana (2007), Fukuda and Kon (2010), and Matsumoto (2019), we construct two models for analyzing the impacts of foreign reserves accumulation on

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export and foreign direct investment, respectively in the following equations.

$$EXP_{it} = \alpha_{0i} + \alpha_{1i}FRA_{it} + \alpha_{2i}FDI_{it} + \alpha_{3i}INFRA_{it} + \mu_i + \varepsilon_{it}$$
(1)

$$FDI_{it} = \beta_{0i} + \beta_{1i}FRA_{it} + \beta_{2i}EXP_{it} + \beta_{3i}INFRA_{it} + \mu_i + \varepsilon_{it}$$
(2)

In Equation [1], the dependent variable is export (EXP). The α_0 is a constant term, and α_1 to α_3 are estimated parameters in model, indicating foreign reserves accumulation (FRA), foreign direct investment (FDI), infrastructure development (INFRA) respectively. In Equation [2], the dependent variable is FDI. The β_0 is a constant term, and β_1 to β_3 are estimated parameters in model, indicating foreign reserves accumulation, export, and infrastructure development, respectively. The coefficients α_1 , α_2 , β_1 , and β_2 are expected to indicate a positive sign. In each equation, *i* is a cross section data for countries concerned, *t* is a time series data, ε_{it} is the error term.

3.3 Estimation Procedure

The empirical study is carried out in three steps. We begin by performing the preliminary tests, such as stationary test and cointegration test. We then performed coefficients estimation by employing ARDL/PMG, FMOLS and DOLS methods.

3.3.1 Panel Stationary Test

We first conduct panel unit root tests before performing the model estimations. The test is carried out to avoid spurious regression, which may cause misleading results (Asteriou and Hall, 2007). According to Baltagi (2005), Levin, Lin, and Chu (hereafter LLC) and Im, Pesaran, and Shin (hereafter IPS) are the most efficient tests for stationarity for panel data analysis. This study conducts the panel root test using the IPS test, and the Akaike Info Criteria (AIC) is chosen for lag length selection. The IPS begins by defining a separate ADF regression for each cross-section with individual effects and no time trend, and specified as follows.

$$\Delta y_{it} = \alpha_i + \rho_i y_{i,t-1} + \sum_{j=1}^{\rho_t} \beta_{tj} \, \Delta y_{i,t-j} + \delta_i + \varepsilon_{it} \tag{3}$$

Where i = 1, ..., N and t = 1, ..., T. y_{it} is the dependent variable being tested. The Δ denotes first difference in the dependent variable. The α_i, ρ_i , and δ_i are the parameters. The ρ_t is the number of lags to be included in estimation and ε_{it} is the error term.

The IPS uses separate unit root tests for the *N* cross-section units. As the test is based on the Augmented Dickey-Fuller (ADF) and averaged across groups, after testing the separate ADF regressions, the average of the *t*-statistics for parameter ρ_i from the individual ADF regressions, $t_{iT}(\rho_i)$:

$$\bar{t}_{NT} = \frac{1}{N} \sum_{i=1}^{N} t_{iT}(\rho_i \beta_i) \tag{4}$$

The \bar{t} is then standardized and show that the standardized \bar{t} statistic converges to the standard normal distribution as N and $T \rightarrow \infty$. Im, Pesaran and Shin (2003) assumed the cross-section dataset was balanced and \bar{t} test has better performance when N and T were not too large. They proposed across-sectionally demeaned version of both tests to be applied in the case where the errors in varied regressions contain a common time specific component.

3.3.2 Cointegration Analysis

Once the order of stationary has been defined, we apply Pedroni's cointegration test. In principle, the cointegration analysis determines whether two or more variables are correlated for a specified period. The panel cointegration tests proposed by Pedroni (1999) consider heterogeneity by using specific parameters that are allowed to vary across individual members of the sample. Taking into account such heterogeneity constitutes an advantage because it is unrealistic to assume that the vectors of cointegration are identical among individuals on the panel. Pedroni test allows for individual member-specific fixed effects, deterministic trends and slope coefficients. The application of Pedroni's cointegration test requires first estimating of hypothesized long-run regression of the following form:

$$y_{i,t} = \alpha_i + \delta_{it} + \beta_{1i} x_{1i,t} + \beta_{2i} x_{2i,t} + \dots + \beta_{Mi} x_{Mi,t} + \varepsilon_{i,t}$$
(5)

for i = 1, ..., N; t = 1, ..., T; m = 1, ..., M, where N refers to the number of individual members in the panel; T refers to the number of observations
over time. In this equation, the α_i is the member specific intercept or fixed effects parameter which varies across-sectional units. The δ_{it} is slope cooefficients and cross-section specific time effects.

Under the null hypothesis of no cointegration, the residual will be stationary at first differece. We shall obtain the residuals from Equation [6] and then test the residuals by running the following regression:

$$\varepsilon_{it} = \rho_i \varepsilon_{it-1} + \sum_{j=1}^{p_i} \varphi_{ij} \Delta \varepsilon_{it-j} + v_{it}$$
(6)

for each cross-section in the panel. Pedroni describes various methods of constructing statitics for testing for null hypothesis of no cointegration. Pedroni construct two tests for the null hypothesis for all cross-section, which he terms: (1) the within-dimension test or panel statistics test and (2) the between-dimension or group statistics test.

Pedroni (1999) defines three statistics $Z_{\hat{v},N,T}$, $Z_{\rho,N,T}$, and $Z_{tN,T}$ respectively, which are based on pooling the residuals along withindimension of panel statistics and two statistics $\tilde{Z}_{\rho N,T}$ and $\tilde{Z}_{tN,T}$, which are based on pooling the residuals along between dimension or group statistics test. The asymptotic distribution of each of five statistic tests can be expressed in the following form:

$$\frac{X_{N,T} \,\mu \sqrt{N}}{\sqrt{\nu}} \Longrightarrow N(0,1) \tag{7}$$

where $X_{N,T}$ is the corresponding statistics from both panel statitics test and group statitics test, while μ and v are the mean and variance of each test respectively. They are provided in the original paper by Pedroni (1999). In summary, the panel v statistics diverges to positive infinity, which large positive values reject the null of no cointegration. The remaining statistics diverge to negative infinity, which large negative values reject the null hypothesis.

A total of eleven statistics with varying degree of properties are generated. In all cointegration tests, a long-run cointegration relationship is established when the p-values for two statitics tests are significant at 5% significance level. Therefore, if the majority of these values are significant then the null hypothesis is rejected, indicating there is cointegration

among variables in the models. Having found that all variables are cointegrated, the study then proceed with the model estimation.

3.3.3 Coefficients Estimation

As we are interested in general long-run elasticities, the pooled mean group (PMG) estimator developed by et al. (1999) is applied. Besides, we fulfill the requirement of panel ARDL/PMG estimation in our models: the balanced data panel and the widest panel dataset to satisfy the condition that the time dimension should be larger than the cross-section dimension (T > N).

According to Pirotte (1999), the pooled mean group estimator provides efficient long-run estimators of dynamic panel data models. Loayza and Ranciere (2006) viewed that the pooled mean group (PMG) estimator restricts the long-run slope coefficients to be the same across countries but allows the short-run coefficients (including the speed of adjustment) and the regression intercept to be country specific. The PMG estimator also generates consistent estimates of the mean of short-run coefficients across countries by taking the simple average of individual country coefficients. Based on Pesaran et al. (1999), we present Equation 1 and Equation 2 in error correction mechanism of autoregressive distributed lag ARDL.

$$\Delta EXP_{i} = \psi_{i}EXP_{i-1} + X_{i}\beta_{i}'(FRA_{it} - FDI_{it} - INFRA_{it}) + \sum_{j=1}^{\rho-1}\varphi_{ij}^{*}\Delta EXP_{i-j} + \sum_{j=0}^{q-1}\Delta X_{i-j}\,\vartheta_{ij}^{*'}\Delta FRA_{i-j} + \sum_{j=0}^{q-1}\Delta X_{i-j}\gamma_{ij}^{*'}\Delta FDI + \sum_{j=0}^{q-1}\Delta X_{i-j}\,\omega_{ij}^{*'}\Delta INFRA_{i-j} + D\mu_{i} + \varepsilon_{it}$$

$$(8)$$

$$\Delta FDI_{i} = \phi_{i}FDI_{i-1} + X_{i}\beta_{i}'(FRA_{it} - EXP_{it} - INFRA_{it}) + \sum_{j=1}^{\rho-1} \varphi_{ij}^{*} \Delta FDI_{i-j} + \sum_{j=0}^{q-1} \Delta X_{i-j} \vartheta_{ij}^{*'} \Delta FRA_{i-j} + \sum_{j=0}^{q-1} \Delta X_{i-j} \gamma_{ij}^{*'} \Delta EXP + \sum_{j=0}^{q-1} \Delta X_{i-j} \omega_{ij}^{*'} \Delta INFRA_{i-j} + D\mu_{i} + \varepsilon_{it}$$
(9)

With *i* and *t* representing cross-section units and the period respectively; The $\psi_i = (\psi_{i1}, ..., \psi_{iT})'$ and $\phi_i = (\phi_{i1}, ..., \phi_{iT})'$ respectively is a $T \times 1$ vector of observations on the dependent variable of the *i*-th crosssection unit; $X_i = (x_{i1}, ..., x_{iT})'$ is a $T \times k$ matrix of observations on the explanatory variables that vary both across group and time periods; $D = (d_1, ..., d_T)'$ is a $T \times s$ matrix of observations on fixed explanatory variables such as intercepts and time trends or those variables that vary over time; $y_{i,-j}$ and $X_{i,-j}$ are *j* period lagged values of y_i and X_i ; $\Delta y_i = y_i - y_{i,-1}$; $\Delta X_i = X_i - X_{i,-1}$; $\Delta y_{i,-j}$ and $\Delta X_{i,-j}$ are *j* period lagged values of Δy_i and ΔX_i ; and $\varepsilon_i = (\varepsilon_{i1}, ..., \varepsilon_{iT})'$. The μ_i indicates the speed of adjustment parameter. The speed of adjustment parameter must be nonzero and less than 0, the $\mu_i = 0$ denotes there is no long-run relationship.

The PMG allows for heterogenous short-run dynamics and common longrun elasiticities based on the pooled mean-group estimator for dynamic heterogenous panel. Pesaran et al. (1999) constructed the PMG estimation technique which the slope parameters are assumed heterogeneous across the group and combine both pooling and averaging of the coefficients. In this respect, the intercept and slope parameters are homogenous in the long-run, and the error correction variances allow difference across the groups. The ARDL/PMG method observes the group specific error adjustment coefficient and short-run coefficient of the regressors. Specifically, Pesaran et al. (1999) assumed that (1) the error terms are serially uncorrelated and are distributed independently of the regressors, i.e., the explanatory variables can be treated as exogenous; (2) there is a long-run relationship between the dependent and explanatory variables; and (3) the long-run parameters are equal across countries.

Pesaran et al. (1999) proposes the Pooled Mean Group (PMG) and the Mean Group (MG) that allow for a certain degree of parameter heterogeneity in panel data regressions. We focus on the PMG estimator considers a lower degree of heterogeneity since it imposes homogeneity in the long-run coefficients while still allowing for heterogeneity in the short-run coefficients and the error variances. The PMG/MG estimator allows for long-run coefficient homogeneity over a single subset of regressors. The consistency and efficiency properties of the two estimators can be tested using a likelihood ratio test or Hausman test.

We also analyze the relationships by applying FMOLS and DOLS methods. It aims to strengthen the empirical findings of this study. In this regard, we attempt again to address the endogeneity and serial correlation that plausibly exist in the two relationship models developed. Phillips and Hansen (1990) viewed that the fully modified method and error-correction method allow consistent and efficient estimation of the

cointegration vectors in a finite sample, thus addressing serial correlation and endogeneity.

Later, Pedroni (1999) posited that the FMOLS allows consistent and efficient estimation of the cointegration vector, thus addresses the issues of endogeneity, simultaneity bias, and non-stationarity of the regressors. Meanwhile, the DOLS method as the parametric estimator accounts for lagged or the first difference term for controlling the endogenous problem (Saikkonen, 1991; Mark & Sul, 2002).

These approaches set out to deal with the issues of heterogeneity and endogeneity, which are the main concerns in a panel data model. By performing the methods, this study implicitly addresses such issues, thus presenting unbiased results. In sum, the consistency of the estimation results would show by ARDL/PMG, FMOLS, and DOLS methods, respectively, imply the robustness of the models in this analysis.

Pedroni (2000) stated that the FMOLS approach allows for the countryspecific fixed effects to be heterogeneous while estimating long-run relationships. Based on Pedroni (2000), the estimator for the *i*-th panel data is given by Equation [10].

$$\hat{\beta}_{FMOLS} = \left[\sum_{i=1}^{N} \hat{\Omega}_{22i}^{2} \sum_{t=1}^{T} (x_{it} - \bar{\mathbf{x}}_{it})^{2} \right]^{1} \left[\sum_{i=1}^{N} \hat{\Omega}_{11i}^{1} \hat{\Omega}_{22i}^{1} \left(\sum_{t=1}^{T} (x_{it} - \bar{x}_{i}) \hat{y}_{i,t} - T \hat{\gamma}_{i}\right) \right]$$
$$\hat{\varepsilon}_{it} = \varepsilon_{it} \hat{\Omega}_{22i}^{1} \hat{\Omega}_{21i} \qquad \hat{\gamma}_{i} = \hat{\Gamma}_{21i} + \hat{\Omega}_{21i}^{0} \hat{\Omega}_{22i}^{1} \hat{\Omega}_{21i} \left(\hat{\Gamma}_{22i} + \hat{\Omega}_{22i}^{0}\right)$$
(10)

where matrix $\Omega_i = L_i L'_i$, L_i is the lower triangular decomposition of Ω_i . The covariance matrix can be decomposed as $\Omega_i = \Omega_i^0 + \Gamma_i + \Gamma_i$, where Ω_i^0 is the contemporaneous covariance matrix, and Γ_i is a weighted sum of autocovariance. Also, $\widehat{\Omega}_i^0$ denotes an appropriate estimator of Ω_i^0 .

Pedroni (2000) emphasized that the main reasons for concern in estimating dynamic cointegrated panels are because the heterogeneity issues with differences in means among the individuals and differences in individuals' responses to short-run disturbances from cointegrating equilibrium. The FMOLS deals with these two issues by including into regression individual specific intercepts and by allowing serial correlation properties of the error processes to vary across individual members of the

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panel. This enables point estimates for the panel group estimator can be interpreted as the mean value for the cointegrating vectors (Pedroni, 2000). Therefore, the test statistics constructed from the panel group estimator are designed to test the null hypothesis $H_0: \beta_i = \beta_0$ for all i against the alternative hypothesis $H_A: \beta_i \neq \beta_0$, so that the values for β_1 are not constrained to be the same under the alternative hypothesis.

Finally, the panel DOLS introduced by Kao and Chiang (2000) have been applied in this study to consider fixed effects in the cointegrating regression models. Mark and Sul (2002) mentioned some properties of DOLS. It allows heterogeneity across individuals include individualspecific time trends, individual-specific fixed effects, and time-specific effects. Also, the estimator is fully parametric, computationally convenient, and more precise than the single equation estimator. Based on Kao and Chiang (2000), the estimator is written as follow.

$$Y_{it} = \alpha_i + \beta_i X_{it} + \sum_{j=-p_1}^{p_2} \delta_j \Delta Y_{it-j} + \sum_{j=-q_1}^{q_2} \gamma_j \Delta X_{it-j} + \varepsilon_{it}$$
(11)

where *p* and *q* denotes the numbers of leads/lags typically chosen using some info criterion; δ_j and γ_j respectively is the coefficient of a lead or lag of first differenced explanatory variables.

$$\hat{\beta}_{DOLS} = \sum_{i=1}^{N} \left(\sum_{t=1}^{T} z_{it} z_{it}^{'} \right)^{-1}$$
(12)

where $z_{it} = [x_{it} - \bar{x}_{i}, \Delta x_{i, t-q}, \dots, \Delta x_{i, t+q}]$ is 2 (q +1) × 1 vector of regressors.

The DOLS involves augmenting the cointegrating regression with lags and leads of so that the resulting cointegrating equation error term is orthogonal to the entire history of the stochastic regressor innovations. Thus, the DOLS estimation method provides a robust correction of endogeneity in the explanatory variables.

4. Empirical Results and Discussion

4.1 Stationary and Cointegration Analysis

Given the macroeconomic variables, the unit-roots for both constant and trend in the panel were tested by applying the Im, Pesaran, and Shin (IPS) test. All variables were tested by the null hypothesis of the existence of a

unit root. The results of the unit root are summarized in Table 1. The IPS test result indicates the presence of a unit root in the first differential for each variable.

	Constan	t	Constant + Trend			
Variable	Level	First Order Difference	Variable	Level	First Order Difference	
EXP	-0.774	-15.388*	EXP	-0.451	-13.524*	
	(0.220)	(0.000)		(0.326)	(0.000)	
FDI	-5.000*	-16.895*	FDI	-6.255*	-11.843*	
	(0.000)	(0.000)		(0.000)	(0.000)	
FRA	-1.486**	-13.043*	FRA	-3.272*	-10.263*	
	(0.069)	(0.000)		(0.001)	(0.000)	
INFRA	-0.978	-12.171*	INFRA	-2.704*	-10.750*	
	(0.164)	(0.000)		(0.003)	(0.000)	

Table 1: Panel Unit Root Test: Im, Pesaran, Shin (IPS)

Note: * and ** indicate rejection of the null hypothesis of no cointegration at one percent level and ten percent levels of significance, respectively.

Subsequently, the study investigates the long-run and short-run impact of foreign reserves accumulation on export and foreign direct investment, respectively. Lag length is selected on the principle of minimum Akaike information criterion (AIC). The long-run coefficients of respective model are exibited in Table 2. Concerning Equation 1, in constant level, we found that four out of seven statistics reject null hypothesis of no cointegration at one percent and five percent level of significance. This result indicates independent variables do hold cointegration in the long-run with respect to EXP.

Equation 1: EXP= FRA, FDI, INFRA							
Test	Constant	Test	Constant+Trend				
Panel v-Statistic	-0.120	Panel v-Statistic	-1.632				
Panel ρ -Statistic	-0.671	Panel ρ -Statistic	0.621				
Panel <i>t</i> -Statistic	-1.724*	Panel <i>t</i> -Statistic	-0.987				
Panel <i>t</i> -Statistic	-2.930*	Panel <i>t</i> -Statistic	-1.961*				
Group ρ -Statistic	0.097	Group ρ -Statistic	1.117				
Group <i>t</i> -Statistic	-1.332**	Group <i>t</i> -Statistic	-0.763				
Group <i>t</i> -Statistic	-2.509*	Group <i>t</i> -Statistic	-1.714				
Equation 2: FDI= FRA,	EXP, INFRA						
Test	Constant	Test	Constant+Trend				
Panel v-Statistic	-0.983	Panel v-Statistic	-1.294				
Panel ρ -Statistic	-1.834*	Panel ρ -Statistic	-3.514*				
Panel <i>t</i> -Statistic	-3.823*	Panel <i>t</i> -Statistic	-7.286*				
Panel <i>t</i> -Statistic	-3.237*	Panel <i>t</i> -Statistic	-6.375*				
Group ρ -Statistic	-3.258*	Group ρ -Statistic	-2.144*				
Group <i>t</i> -Statistic	-6.451*	Group <i>t</i> -Statistic	-7.971*				
Group <i>t</i> -Statistic	-5.450*	Group <i>t</i> -Statistic	-6.730*				

Tabel 2: The Pedroni Panel Cointegration Test

Note: * and ** indicate rejection of the null hypothesis of no cointegration at one percent and five percent level of significance, respectively.

Also, the result of panel cointegation test in Equation 2 with constant level show that six out of seven statistics reject null hypothesis of no cointegration at one percent level of significance. The result shows that independent variables do hold cointegration in the long-run with respect to FDI. Since all the statitics conclude in favor of cointegration with constant level, we conclude that there is a long-run cointegration among our variables in 11 developing countries.

4.2 The Impact of Foreign Reserves Accumulation on Macroeconomic Performance

Given the stationary result and cointegration result, the panel ARDL/PMG method can be utilised to account for long-run and short-run relationships. Table 4 reports the estimates for ARDL/PMG method.

Dependent Variable: D(EXP)										
Selected Model: (2,2,2,2)										
Variable	Coefficient	Std. Error	t-Stats							
Long-run Equation										
FRA	36.586*	10.804	3.386							
FDI	1.448*	0.588	2.465							
INFRA	0.710*	0.135	5.276							
Short-run Equation	Short-run Equation									
С	0.437	0.539	0.810							
ECT	-0.148*	0.038	-3.936							
D(EXP(-1))	0.074	0.061	1.202							
D(FRA)	24.084**	14.588	1.651							
D(FRA(-1))	10.033	7.411	1.354							
D(FDI)	0.313**	0.175	1.785							
D(FDI(-1))	0.006	0.322	0.018							
D(INFRA)	0.034	0.088	0.392							
D(INFRA(-1))	-0.158	0.115	-1.376							
Dependent Variable: D(FDI)		·								
Selected Model: (2,2,2,2)										
Variable	Coefficient	Std. Error	t-Stats							
Long-run Equation										
FRA	7.037*	1.228	5.729							
EXP	0.017**	0.009	1.848							
INFRA	0.044*	0.013	3.467							
Short-run Equation										
С	-0.472*	0.128	-3.679							
ECT	-0.561*	0.089	-6.283							
D(FDI(-1))	0.064	0.071	0.895							
D(FRA)	3.257	3.819	0.853							
D(FRA(-1))	-3.399**	1.802	-1.886							
D(EXP)	0.033*	0.011	2.977							
D(EXP(-1))	-0.017	0.018	-0.947							
D(INFRA)	0.047**	0.028	1.669							
D(INFRA(-1))	0.065*	0.031	2.111							

Tabel 4: ARDL/PMG Estimation Result

The error correction terms (ECT) is negative and less than one. Based on the error correction result, the speed of adjustment of -0.148 from the first model implying a correction of 14.8% for the convergence in the long-

run. In the short-run, PMG estimator show significant positive result of foreign reserves accumulation on export ratio. The foreign direct investment ratio has a significant positive effect on export ratio. However, although infrastructure development has a positive sign as expected it is largely not significant. In the estimation, the ARDL/PMG method shows a positive long-run relationship of FRA, FDI, and INFRA with EXP.

The relationship between foreign reserves accumulation and foreign direct investment is another area analyzed in this study. Table 4 reports the estimates for ARDL/PMG method and shows a significant result that foreign reserves accumulation positively affects FDI. Also, the ARDL/PMG approach exhibits a significant positive effect of export and infrastructure development on FDI in the long-run. The error correction term has a significant negative sign and less than one. The ECT coefficient is -0.561, implying a moderate adjustment toward the long-run equilibrium. In the short-run, the estimation exhibits a significant negative impact of foreign reserves accumulation on FDI. The variable of export and infrastructure development respectively has a significant positive effect on FDI.

We proceed the coefficient estimation by applying the FMOLS and DOLS methods. In the estimation, both estimators show a significant positive relationship between FRA and EXP and between FDI and EXP in the long-run, while neither show a significant relationship between INFRA and EXP although INFRA have a positive sign as expected. The close values of long-run coefficients for all estimation confirm the robustness of the estimated results. Our coefficient estimation in Table 5 shows the variables of FRA, EXP, and INFRA are significant and positively affect FDI in the long run.

In sum, in our export model, the variables of the foreign reserves ratio and foreign direct investment ratio are positively associated with export in the long-run in all three versions of the pooled estimations, indicating that they are key determinants of export growth. Similarly, in our FDI model, the long-run impacts of foreign reserves accumulation, export, ad infrastructure development on FDI in ARDL/PMG estimation are in line with the results of the FMOLS and DOLS estimators.

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	FMOLS DOLS DOLS	oefficient Std. Error t-Stats Variable Coefficient Std. Error t-Stats	779*(0.000) 10.341 4.717 FRA 47.672*(0.000) 13.334 3.575	20*(0.001) 0.390 3.381 FDI 1.176*(0.041) 0.572 2.058 2.058	0.001) 0.077 0.124 INFRA 0.151 (0.207) 0.120 1.264 0.151 (0.207) 0.120 0.120	0.722 R-squared 0.776	0.714 Adj R-squared 0.691		FMOLS DOLS	oefficient Std. Error t-Stats Variable Coefficient Std. Error t-Stats	28*(0.003) 2.148 3.039 FRA 7.203*(0.010) 2.778 2.593	48*(0.003) 0.016 2.972 EXP 0.043*(0.043) 0.021 2.029	36*(0.015) 0.015 2.436 INFRA 0.060*(0.008) 0.023 2.680	0.346 R-squared 0.505 0.505	
	FMOLS	Coefficient Std. E1	48.779*(0.000) 10.34	1.320*(0.001) 0.39	0.010 (0.901) 0.07	_			FMOLS	Coefficient Std. E1	6.528*(0.003) 2.14	0.048*(0.003) 0.01	0.036*(0.015) 0.01	-	
Equation 1		Variable	FRA	FDI	INFRA	R-squared	Adj R-squared	Equation 2		Variable	FRA	EXP	INFRA	R-Squared	

Tabel 5: FMOLS/DOLS Estimation Results: Pooled Method

Indeed, the 11 developing countries experienced depreciation in foreign exchange rates. Notwithstanding the exchange rate depreciation due to the acceleration in foreign reserves holding, this study shows foreign reserves accumulation has a positive effect on exports and FDI in developing countries. This result is in line with arguments in seeing foreign reserves accumulation as driven by a desire to maintain competitive exchange rates, fostering export and FDI and, hence, economic growth.

By providing a balanced panel dataset and a lengthy period of coverage, our empirical results complement the previous works for instance, Polterovich and Popov (2003), Fukuda and Kon (2010), and Matsumoto (2019). These studies favours the foreign reserves accumulation to achieve export growth, attract foreign direct investment, thus long-run economic growth. Polterovic and Popov (2003) for instance, concluded hefty foreign reserves accumulation undervalued the exhange rate and build the credibility of the government, which both attracts FDI. Fukuda and Kon (2010) shows foreign reserves accumulation expands the share of the exportable sector and fosters FDI in developing countries. Matsumoto (2019) summed that stockpiling foreign reserves depreciates the real exchange rate, which allows a shift towards the tradable sector and FDI, thus economic growth.

Our results may also have some interesting policy implications. Firstly, the countries concerned should consider putting in policy mechanisms for ensuring the positive contribution of FRA side by side that acceleration in foreign reserves accumulation does not bear the social cost to the economy. The developing countries need to take prudent considerations in addressing the social costs of holding international reserves, as are concluded in Rodrik (2006), Mezui and Duru (2013). Secondly, since the foreign reserves accumulation is measured by the total amount of foreign reserves (not include the gold holding), our results imply that foreign currencies reserves are more reliable to accumulate for setting up the precautionary motives of stockpiling foreign reserves.

5. Conclusion and Policy Implications

Having an economic background of a group of Asia-Africa countries, this study aims to analyze the impacts of foreign reserves accumulation on export and FDI over the past four decades. We applied panel ARDL/PMG approach with a constant term and both FMOLS and DOLS estimators

with pooled method. This paper concludes the existence of a robust and statistically significant long-run cointegrating relationship between foreign reserves accumulation and export and between foreign reserves accumulation and FDI. Following the empirical findings, we recommend a more in-depth study for a balanced panel dataset with more countries on the effectiveness of foreign reserves holding (only in the form of foreign currencies) rather than foreign currencies and gold holding.

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ABSTRACT

This paper aims to determine the effects of regional trade agreements as well as the impact of political crises on the East African Community's (EAC) imports with control of other traditional determinants of imports. I use a sample of bilateral imports for 5 EAC member countries from 142 partners for the period 2001–2018 and I account for common and individual slope. Using an 'augmented' gravity model with specific dummies and isolation of nonobservable characteristics of countries and time, I apply a Poisson Pseudo Maximum Likelihood High Dimensional Fixed Effects (PPMLHDFE) estimator that deals with the problem of heterogeneity. I found that regional trade agreements have disproportionate effects on EAC member countries' imports; Kenya beneficiates the most from these agreements given its advanced economic level. Political crises have disproportionate effects on EAC imports, with a higher negative impact found for Burundi due to the failed putsch in 2015.

ملخص

تهدف هذه الورقة البحثية إلى تحديد آثار اتفاقيات التجارة الإقليمية وكذلك تأثير الأزمات السياسية على واردات مجتمع شرق أفريقيا (EAC) مع مراجعة المحددات التقليدية الأخرى للواردات. وقد استخدمت عينة من الواردات الثنائية لخمسة دول أعضاء في مجموعة دول شرق أفريقيا من 142 شريكا لفترة 2011-2018 وقمنا بحساب المنحدر المشترك والفردي.وباستخدام نموذج الجاذبية

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"المعزز" مع نماذج محددة وعزل الخصائص التي لا يمكن ملاحظتها للبلدان والوقت، قمنا بتطبيق مُقدر دالة الاحتمالية القصوى لنموذج معلمات التأثيرات الثابتة عالية الأبعاد (PPMLHDFE) الذي يتعامل مع مشكلة عدم التجانس. ولقد وجدنا أن اتفاقيات التجارة الإقليمية لها تأثيرات غير متكافئة على واردات البلدان الأعضاء في مجموعة دول شرق أفريقيا؛ وتستفيد كينيا أكثر من غيرها من هذه الاتفاقيات نظرا لمستواها الاقتصادي المتقدم. وللأزمات السياسية آثار كبيرة على واردات مجتمع شرق أفريقيا، مع وجود تأثير سلبي أكبر على بوروندي بسبب الانقلاب الفاشل في عام 2015.

ABSTRAITE

Cet article vise à déterminer les effets des accords commerciaux régionaux ainsi que l'impact des crises politiques sur les importations de la Communauté d'Afrique de l'Est (CAE) avec le contrôle des autres déterminants traditionnels des importations. J'utilise un échantillon d'importations bilatérales pour 5 pays membres de l'EAC en provenance de 142 partenaires pour la période entre 2001-2018 et je tiens compte de la pente commune et individuelle. En utilisant un modèle de gravité "augmenté" avec des dummies spécifiques et l'isolation des caractéristiques non observables des pays et du temps, j'applique un estimateur de Poisson Pseudo Maximum Vraisemblance à Effets Fixes de Haute Dimension (PPMLHDFE) qui traite le problème de l'hétérogénéité. J'ai remarqué que les accords commerciaux régionaux ont des effets disproportionnés sur les importations des pays membres de la CAE ; le Kenya bénéficie le plus de ces accords étant donné son niveau économique avancé. Les crises politiques ont des effets disproportionnés sur les importations de la CAE, avec un impact négatif plus important pour le Burundi en raison du putsch manqué de 2015.

Keywords: Regional integration, Imports, Political violence, Gravity Model, PPMLHDFE, East African Community.

JEL Classification: C23, C51, F1, F15

1. Introduction

Africa, especially Sub-Saharan Africa, is recognised for various forms of political instability: changes in governments, coups d'Etat, electoral crises, crises between countries and within countries, etc. These different forms of crises are the source of internal conflicts which may have tragic economic and social implications for the concerned countries, and the

world in general. The East African Community (EAC) is no exception to this phenomenon. Re-established in 2000 between the Republics of Kenya, Tanzania and Uganda after his collapse in June 1977², the new EAC which is currently made by seven Partner States –Burundi, Democratic Republic of Congo, Kenya, Rwanda, South Sudan, Tanzania, and Uganda, has faced several political crises that shake the region and whose economic consequences need to be assessed. Although the Partner States have signed engagements to the promotion of peace, security, and stability within, and good neighbourliness among the Partner States; political violence remains a reality within some EAC member countries.

For instance, Kenya has experienced electoral violence caused by strong tensions between presidential candidates' supporters at the end of 2007 and earlier 2008, following the announcement of Mwai Kibaki as the president of the Republic of Kenya on December 29th, 2007 (Dupas and Robinson 2012). The announcement triggered violent protests that quickly turned into ethnic clashes leading in a state of emergency that virtually shut down roads and markets (Dupas and Robinson 2012). In the wake of the vote, over 1000 people were killed; this was previously confirmed by Kiai (2008) and Kilonzo (2009). An estimated 300,000 to 500,000 people were forced to flee their homes, 75% of whom were women and children (Kiai 2008; Obonyo et al. 2008). Similar violence was observed in 2012-2013 in the Coast, Eastern, and North Eastern provinces of the country and resulted in more than 500 people killed and almost 120,000 people displaced (Pommerolle and Josse-Durand 2017). In Burundi, the alarming situation was observed in 2015 after the failed putsch that led to the suspension of activities of many transport agencies linking many countries in the region. On May 13th, 2015 a putsch was attempted, initiating a downward spiral of political violence, repression, and killings that have continued till early 2016. This violence caused enormous losses that have repercussions on the productivity and

² Kenya's dominance was among the reasons for the collapse of the old EAC that was established in 1967: Tanzania and Uganda believed that Kenya was getting a disproportionate share of the benefits given its more advanced industry (Buigut 2016; Kimenyi and Kuhlmann 2012). Beyond economic factors, divergent political positions and ideologies are among the causes that bring the old EAC to collapse (Mathieson 2016; Wama 2014).

development of the country. For example, travel agencies such as Gaga, Horizon, Jaguar coaches, etc. between Bujumbura Kampala via Kigali were forced to suspend their activities following insecurity in Bujumbura and other political tensions between Burundi and Rwanda in 2015.

A matter of concern is the economic costs associated with electoral violence which generally are high and multifaced. At the micro level, conflict can compromise economic growth and impede human development. As noted by Fukuda-Parr (2008) et al. And Lopez and Wodon (2005), the short-run economic impact of conflict is especially pronounced in the casualty levels, displacement, and destruction of physical capital which can have immediate repercussions on production, internal trade, and output levels. At the macro level, conflicts' costs and consequences analysis is extended to conflicts-affected contexts with economic impacts such as declines in GDP growth, Foreign Direct Investments, and international trade. In one hand, political instability leads to lower performances observed in trade agreements in Africa by reducing investments (Jung 2017). In another hand, evidence shows that almost 20 years after the implementation of the East African Customs Union, trade within EAC remains relatively low -less than 40% of intraexports- with variations despite efforts made by the Partner States to boost intra and inter-trade significantly. Against this background, could the low performances observed in EAC's trade be related to electoral violence? Do election conflicts have proportionate effects on trading activities between EAC's trading partners? To my knowledge, little emphases has been made on such concern. Previous studies have focused on the trade creation/ diversion effects of RTAs (see Buigut 2012; Shinyekwa 2015; Buigut 2016; Ejones et al., 2021), or on challenges of the full implementation of their protocols (see Wama 2014; Bangayandusha and Mwenedata 2016). Little is known on the causes behind the stagnation and fluctuation of intra and inter-EAC's trade.

This paper aims to investigate the impact of electoral violence on trade performance using an approach based on the application of the law of gravity. It has been highlighted in previous studies that the gravity equation is a well-founded theoretical and successful tool to assess the effects of regional trade agreements (see Anderson 1979; Feenstra, Markusen and Rose 1998, Yotov et al. 2016). I estimate an augmented gravity model with dummy variables by applying Poisson Pseudo Maximum Likelihood High Dimensional Fixed Effects –PPMLHDFE– estimator.

The rest of the paper is articulated as follows. Section two reviews the relevant literature, section three describes the model and data used for econometric analysis. Section four presents the econometric results and section five concludes.

2. Literature Review

Theoretically, political instability has been seen by economists as a threat to economic development. Authors argue that an unstable political system can slow down investment or accelerate inflation, and consequently reduce the GDP growth rate (see Aisen and Veiga 2013; Durnev et al. 2012; Guillaumont et al. 1999; Gurgul and Lach 2012). In Sub-Saharan Africa, the various forms of political instability previously discussed may lead to political violence. These two terms will have to be differentiated in the context of my analysis. Political instability is seen as the set of policy reforms (Rodrik 1991), propensity for government changes (Gurgul and Lach 2013), cabinet changes (Aisen and Veiga 2006), coup d'état, political regime change, and revolutions (Jong-A-Pin 2009). By contrast, political violence is defined as the set of all violent acts that result from political instability, such as ethnic clashes (Dupas and Robinson 2012; Reuss and Titeca 2017), assassinations (Kiai 2008; Kilonzo 2009; Pommerolle and Josse-Durand 2017), arrests and forced displacements (Kiai 2008; Obonyo et al. 2008; Pommerolle and Josse-Durand 2017).

There is no doubt that several forms of political violence have heavy consequences on EAC's economic development and especially, on EAC's international trade. The previously mentioned crises may decrease trade in the region leading to the decrease of the welfare of the population. As I mentioned it earlier in the introduction, few studies have addressed this concern. Many studies that assess the impacts of EAC focused importantly on the impacts of trade liberalisation on trade creation or trade diversion (see Buigut 2012; Buigut 2016; Ejones et al., 2021; Shinyekwa, 2015).

These studies largely found positive impact on trade creation among member countries, giving an impression that the East African Customs Union (EACU) has been quite successful in bolstering intra-regional trade.

Meanwhile, despite positive effects of EACU found in the above studies, challenges on its successful implementation remain. This can be observed through intra-trade patterns in the region. Twenty years after EACU implementation, trade between member countries remains low with fluctuations. Given this, studies have addressed challenges on the the EACU-CM successful implementation of (Wama 2014: Bangayandusha and Mwenedata 2016). Wama (2014) argues that the issue of state sovereignty, language barrier, poor infrastructure, bureaucracy and corruption, low public awareness across the community, slow harmonization of Partner States' laws, policies, and systems are among challenges faced by EAC countries. In the same vein, Mwenedata (2016) investigated the legal challenges in the realization of the free movement of capital in Rwanda under the EAC common market. Lack of effective institutions for monitoring the implementation of the Common Market and contradiction in laws of countries and the Protocol are among challenges that affected the successful implementation of the EAC. This gave the impression that to the moment, many issues that impede trade developments in the region remain outstanding such as the imposition of legal non-tariff barriers, non-recognition of EAC certificates of origin at borders and political violence. In this study I am interested in the last challenge, which has attracted less attention in empirical studies. Given the importance of political stability to the economy and especially to international trade enhancement, there is a need to investigate the impact of political crises on trade activities especially, how the electoral violence affect trade flows between member and trade partners of the EAC countries.

To my knowledge, few studies has assessed the linkage between electoral violence and trade in Africa in general, and particularly in EAC. The working paper by Jung (2017) is among the few studies that have addressed the issue. Jung (2017), in his working paper produced recently, argues that political instability leads to lower performances observed in

trade agreements in Africa by reducing investment which are important in African countries given the gains from the stimulation of investment in production for export and export-linked industries. Thus, his argument joined Rodrik (1991) and Durnev et al. (2015)'s results in this quote:

Foreign investors, African countries' primary financial source, are less willing to invest in a country or region where political instability and international conflict are evident (Jung 2017).

However, Jung (2017) does not show clearly empirical evidence of how political violence affect trade, a gap that this study will try to fill. I should clarify that this study does not analyse violence itself; rather, the objective is to analyse the impact of those violence on import flows in EAC member countries. Filling this gap may be useful for researchers and policy makers, as it could be the first step in a more complex analysis of the economic impact of different forms of political violence in the EAC region.

3. Methodological Framework

3.1. Specification of the gravity model

Assessment of RTAs could not be possible without the contribution of the famer gravity model. Gravity models first appeared in economics in 1962 with the pioneering study of Tinbergen (1962), who applied Newton's law of gravity to bilateral trade flows, theorizing that trade flows between two countries are proportional to the size of their incomes and inversely proportional to the distance between them.

The basic form of the gravity model is as follows:

$$T_{ij} = \beta \frac{Y_i Y_j}{D_{ij}} \tag{1}$$

Where T_{ij} measures bilateral trade flows between countries i and j; Y_i and Y_j are the gross domestic products (GDP) of countries i and j, respectively;

and D_{ij} is the geographic distance between countries i and j, a proxy for trade costs. Trade flows are expected to increase with the size of GDP and decrease with the geographic distance between trading partners. Specifically, a high level of income in the importing country indicates high demand leading to increased imports, while a high level of income in the exporting country suggests a higher level of production which increases exports. In this case, Y_i and Y_j are positively correlated with the level of bilateral trade flows (Cernat 2001).

For estimation purposes, the log-linear form of the gravity model is used to estimate the effects of RTAs on trade in terms of trade creation and diversion. By adding the time dimension, equation (1) becomes:

$$lnT_{ijt} = \beta_0 + \beta_1 lnY_{it} + \beta_2 lnY_{jt} + \beta_3 lnD_{ij} + \varepsilon_{ij}$$
(2)

Where *ln* is the natural logarithm of the variables. T_{ijt} measures bilateral trade flows between countries i and j in period t at constant prices (USD); Y_{it} and Y_{jt} are the GDPs of countries i and j, respectively, in period t at constant prices (USD); β_0 is the global constant of the model, ε_{ij} is a normally distributed log error. D_{ij} is as defined above and remains constant over time. The sign of β_3 is negative due to proximity: the greater the distance between trading countries, the higher the costs, which negatively affects trade flows between countries.

3.2. Handling gravity equation estimation issues

I underline in this section four major gravity estimation issues and how I address them to obtain consistent and reliable estimates. Firstly, the traditional gravity model (1) has been criticized for tending to lack strong theoretical foundations. According to Shinyekwa (2015), it has been argued that the model lacks the ingredients of the most important international trade models, namely the Ricardian model (differences in technology) and the Heckscher-Ohlin (HO) model (differences in factor endowments) as a basis for trade (UNCTAD and WTO 2012). This view has, so far, been reconsidered due to more illuminating empirical work and details, as reported in Shinyekwa and Othieno (2013). A review by Cernat (2001) argues that most early papers using gravity models were ad

hoc rather than based on sound theoretical foundations. Exceptions to this trend include the later work of Anderson (1979), Bergstrand (1990) and Feenstra, Markusen and Rose (1998) that have highlighted some theorical foundation of the gravity equation. To overcome this challenge and following Kahouli and Maktouf (2014); Baltagi et al. (2003); I include in the equation (2), a new variable 'Sim' variable to capture similarities in the size of economies of the trading countries.

The second challenge is related to trade costs. The term D_{ij} in equation (2), which is account for distance between two cities, is considered as the only proxy for trade costs. However, it has been highlighted that other variables may influence trade costs either positively or negatively. To overcome this challenge and following some studies using the gravity model to estimate RTAs' impacts (see e.g. Urata and Okabe 2014, Yotov et al. 2016; Helpman and Krugman 1985; and Helpman 1987), I assume that the bilateral trade cost is expressed as the following linear combination of observable measures including contingency, colonial ties (colony and common colony), language official and political crises.

$$T_{ij} = Dist_{ij} \exp(-\beta_3 Contigij - \beta_4 Colony + \beta_5 Col + \beta_6 Comcol + \beta_7 Comlang + \beta_8 Polcris)$$
(3)

Where *Dist*_{ij} is the geographical distance between the largest cities of countries i and j measured by kilometer, *Contig*_{ij} and *Comlang*_{ij} are dummy variables that take unity if country i and j share a common border and common official languages, respectively. I include the variable political crises –to account for election conflicts– as one of observable measure of bilateral costs. This choice is powered by the fact that electoral violence during election periods in the country of destination –importer country– infers in trade costs through several dimension such as reduction of labor and infrastructure disruption. It is a well-documented fact that volume and quality of infrastructure across countries are important determinants of trade flows given their impacts on transport costs, especially for landlocked countries. As it was argued by Bougheas et al. (1999), the benefit of infrastructure is the reduction in transport costs which effectively reduces the price of imports.

The EAC infrastructure, -mainly made by roads, railway- is subject to attacks in electoral periods in some countries. The rise in crime through activities of organized gangs contributed to worsening insecurity on main roads. An example is the erection of roadblocks on the Eldoret-Nairobi road via Nakuru during the first election related crisis in Kenya in 2007 (Porhel 2008). The deterioration of infrastructure may raise costs leading to reduction of trade volumes.

Thus, for estimation purposes, I use the log-linear form of bilateral imports, the equation including all the above variables is given as follows

 $lnM_{ijt} = \beta_0 + \beta_1 lnY_{it} + \beta_2 lnY_{jt} + \beta_3 lnDist_{ij} + \beta_4 ln Pop_{it} + \beta_5 lnPop_{jt}$ $+ \beta_6 lnRER_t + \beta_7 lnSim_{ijt} + \beta_8 Conting_{ij} + \beta_9 Col_{ij} + \beta_{10} Comcol_{ij}$ $+ \beta_{11} Lang_of_{ij} + \beta_{12} Polcris_{it} + \kappa_i + \kappa_j + \varepsilon_{ijt}$ (4)

Where *Polcris* stands for capturing the effects of election conflicts on bilateral imports when contagion effects³ are taken in consideration. This variable takes value of one for periods of violence in region 2008, 2013, 2015 and zero otherwise.

The choice of bilateral imports as the dependent variable is influenced by two major reasons:

a) This study aims to analyses the impact of political violence which infers to trade costs. Here I assume that trade costs affect the aggregate imports values.

b) The availability, credibility, and reliability of import data. This argument is supported by Deme and Ndrianasy (2016) when they argue that import data are known to be more readily available and reliable than export data.

³ Contagion effects simply mean that given the interaction between EAC member countries, electoral violence in one country will affect directly or indirectly other countries.

The third challenge is the issue of missing trade flows. Due to missing data in most of the dataset for gravity model, several approaches have been proposed to handle missing data, among them replacement of missing data by zero (Mujahid and Kalkuhl 2016; Urata and Okabe 2014). For instance, the percentage of zero-trade flows in sample of this study is 25%. It has been highlighted by Urata and Okabe (2014), that a large number of studies on the gravity model have omitted zero-trade flows given the linear logarithmic form of gravity equation that does not allow to define the log value of zero. However, omitting zero trade may lead to inconsistent results. To this end, following Correia et al. (2010), I use STATA software and apply PPMLHDFE estimator which deals perfectly with missing data in gravity equation.

The fourth challenge is related to the heteroscedasticity of trade data. It is a well-documented fact that trade data are characterised by heteroscedasticity. This issue is of a serious matter as it was highlighted by Santos Silva and Tenreyro (2006) that, when the gravity model is estimated in log-linear form with the Ordinary Least Squares –OLS– estimator (or any other estimator that requires non-linear transformation), the estimates of the effects of trade costs and trade policy are biased and inconsistent, in the presence of heteroscedasticity. Again, I apply PPMLHDFE estimator to overcome this challenge as proposed by Correia et al. (2019).

Finally, I use countries effects, country-pair effects and time effects to capture all the unobservable characteristics that are specific to countries, country-pair and time, and that may influence trade relations between countries.

The global model is decomposed as follows:

 $lnM_{ijt} = \beta_0 + \beta_1 ln \ GDP_{it} + \beta_2 ln \ GDP_{jt} + \beta_3 ln \ Dist_{ij} + \beta_4 lnPop_{it} + \beta_5 lnPop_{jt} + \beta_6 ln \ RER_{ijt} + \beta_8 ln \ Sim_{ijt} + \beta_9 Contig_{ij} + \beta_{10}Col_{ij} + \beta_{11}Comcol_{ij} + \beta_{12}Lang_off_{ij} + \beta_{13}Polcris_{it} + \kappa_i + \kappa_i + \varepsilon_{ijt}$ (5)

3.3. Dataset characteristics

I use panel data consisting of 5 cross-sectional units (of EAC member countries⁴), 142 major trading partners, making a total of 147 countries for a period of 18 years (2001-2018), giving a sample size of 2,646 and a total pool of 13,230 data points. The percentage of missing data is about 25%. Data on aggregate bilateral imports were extracted from the COMTRADE database. Data on GDP, population and exchange rate were taken from the World Development Indicators database and finally data on distance, contingency, colonial ties, and language were extracted from the CEPII database. The remaining data were constructed by the author. All estimations are done using Stata 16.1 which perfectly deals with missing data.

I classify the exporters according to their income levels to allow us to measure the sensitivity of trade between countries with regards to political violence. Table 1 Shows that 21.46% of the EAC's trading partners from 2001 to 2018 are low-income countries while 29.25% are high-income countries. The remaining exporters, about 50% are middle-income countries.

Classification	Frequency	Percentage	
Low-income	2839	21.46	
Middle-income lower bracket)	3266	24.69	
Middle-income upper bracket)	3255	24.60	
High-income	3870	29.25	
Total	13230	100.00	

Table 1: Classification of main exporters of EAC's member countries

Note: Low-income: per capita GDP ≤ 1025 USD Middle-income lower bracket): 1025< per capita GDP < 3996 Middle-income upper bracket): 3995 < per capita GDP < 12376 High-income: per capita GDP ≥ 12376

⁴ With the exception of Democratic Republic of Congo and South Sudan given their recent adhesion to the EAC.

4. Findings and discussions

This section presents the econometric results and their interpretations. I estimate several sets of regression models. For estimates, in accordance with what has been suggested in many studies, I run estimation controlling for multilateral resistance terms (MRT) by considering importer effects and exporter effects using Pseudo Poisson Maximum Likelihood (PPMLHDFE) estimator. In the same vein, country-pair fixed effects also are used to handle the endogeneity of variables. In this case, the estimator used is robust to statistical separation and convergence issues as developed in Correia, Guimarães and Zylkin (2019). I start by omitting effects of political violence, and then I add 'Polcris' variable in second specification to account for its effects on EAC imports. Second, I continue with the estimation accounting for heterogeneous across countries and I estimate the gravity specification for individual country, this will allow me to focus on the comparison of magnitude of political violence's effects in each EAC member country.

4.1. Estimating the determinants of EAC's imports: bloc results

Bloc results are presented in Table 2. When country-pair unobservable characteristics are fixed, the income elasticities of importer and exporter are positive and statistically significant at 1% level, clearly demonstrating that imports are strongly correlated with GDPs of traders. The magnitude of the coefficients of GDPs suggests that trade flows to the EAC region are more sensitive to the economic development of exporters than they are to the income level of the importers. The impact become negative when outwards MRT are controlled.

As expected, the distance to the exporter's capital is highly significant and negative, consistent with the theory suggesting that distance is associated with transportation and distribution costs in international trade. This is confirmed by the coefficient associated to the distance in the Model 1 to 6 of Table 2. For example, results in Model 1 indicate that all things being equal, an increase of 10 % in distance between two capital cities of traders decreases trade among them 18.12 %. As the distance in kilometres increases, trade decreases about 2 times; in other words, distance has a

strong negative effect on the volume of trade between the sample countries suggesting that the more countries are far from each other, the less they trade. These results align with the theory of geographic proximity in trade (Krugman, 1991) and many other results such as reported by Yotov et al. (2016); Urata and Okabe (2014); Kahouli and Maktouf (2014) and Ejones et al. (2021).

With exception to Model 6 where country pair effects are accounted and, showing a negative impact, other estimations show a positive statistically significant impact of the population of traders —EAC members countries and their partners—. For instance, the coefficients associated with the size of the population of exporters (partners) are statistically significant at the 1% level indicating that the more the population size of partners increases the more there is a production of a wider variety of goods with more efficiency (economies-of-scale effect), resulting in a higher level of exports. These results are consistent with results obtained by Kahouli et Maktouf (2014); they contradict somehow findings in Deme and Ndrianasy (2016), suggesting that the population of both importer and exporter countries have a negative impact on imports of ECOWAS members.

As I excepted, estimates show a negative and statistically significant impact of the movements in the official exchange rate. The significance attributed to the variable measuring the similarities in economic development shows a statistically significant and positive coefficient in all estimates suggesting that countries with similar economic size will have important trade relations. The results are strongly consistent with results found by Baltagi et al. (2003), but contradicts results obtained by Kahouli and Maktouf (2014) due the heterogeneity in their trade data.

The coefficients of contiguity and common language are negative when importer effects are included (in Models 1 and 4). Accounting for exporter specific unobservable characteristics and adding the RTAs' variables in regressions (Model 5) changes the signs of these two variables from negative to positive, suggesting that sharing border increases trade among countries. Differences in findings may result in the dependent variable bilateral imports—, heterogeneity of exporters as well as the effects accounted while running regressions. The effects are not similar across countries as I underlined it in the following sub-section. Similar to the findings of this study, positive effects are found in studies by Buigut (2016), Deme and Ndrianasy (2016), Shinyekwa (2015); negative effects were found in study by Kahouli and Maktouf (2015), while no effects were pointed out in study by Ejones et al. (2021).

Coefficient associated with colonial ties shows a positive and statistically significant impact of EAC imports. For instance, index of colony in Model 2 indicates that imports from EAC coloniser increase over $(100*(e^{0.806}-1)=123.89\%)$. Trade relations are strong in countries that shared the same coloniser with an increase of over 186.62% as shown in column (1). These results align classical results of the gravity model (see Linders and Groot 2006; Deme and Ndrianasy 2016) but contradict with results in Kahouli and Maktouf (2015) when they apply fixed effects model.

4.1.1. Estimating the impact of RTAs on imports

RTAs effects are shown from Model 4 to Model 6 of Table 2. Generally, including RTAs variables in estimates does not change significantly the sign of other determinants of imports in the EAC. The estimated coefficients of EACU are statistically not significant in columns (4) and (5), suggesting that EACU has a no trade effect over time on imports of EAC members under trade liberalisation policy. But when countries pair specifics non-observables effects are absorbed the EACU reports a negative effect about over $(100*(e^{-0.461}-1) = -34.36\%)$ on imports of EAC as a group. These results have economic implication on trade diversion and then welfare decreasing in the concerned countries. But, again here, the effects largely differ among EAC member countries as it is pointed out in Table 4.

COMESA is a RTAs that influence trade flows within EAC members. Its coefficient is positive in most of estimates. The estimations of Model 5 and Model 6 in Table 2 show a strong statistically significant coefficient suggesting that there are important intra-EAC bilateral imports that are resulting of the COMESA free-trade agreement (and not of EAC agreement). This can be seen specially in Model (6). Its statistically and

positive coefficient (2.233) suggests that all else being constant, COMESA increases trade between members by about $(100*(e^{2.233}-1) = 832.78\%)$. The magnitude of coefficients of EACU and COMESA states that trade flows are sensitive and important within COMESA than EAC agreements. These results are similar to results from Ejones et al. (2021). His estimate at baseline found that the coefficient for COMESA was quite higher than EAC with 2.906 and 0.557 for COMESA and EAC, respectively.

Independent	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
variables						
ln GDP		-0.295***	0.650***		-0.313***	0.619***
importer						
		(0.0935)	(0.228)		(0.0928)	(0.225)
ln GDP	1.593***		1.352***	1.598***		1.415***
exporter						
	(0.0832)		(0.176)	(0.0828)		(0.174)
In Distance	-1.812***	-1.017***		-1.771***	-0.699***	
	(0.107)	(0.221)		(0.138)	(0.271)	
In population		0.913***	-2.631**		0.933***	-2.652**
Importer						
		(0.122)	(-1.040)		(0.121)	(-1.031)
ln Exporter	0.122***		-0.484***	0.120***		-0.464**
population						
	(0.0257)		(0.188)	(0.0260)		(0.190)
ln official		-0.132***	0.210		-0.133***	0.195
exchange rate						
		(0.0188)	(0.369)		(0.0183)	(0.367)
Similarity	0.743***	0.803***	0.360*	0.751***	0.810***	0.400**
	(0.0902)	(0.0591)	(0.188)	(0.0883)	(0.0597)	(0.187)
Contiguity	-0.539***	-0.0209		-0.670***	0.751***	
	(0.198)	(0.105)		(0.178)	(0.185)	
Official	-0.277***	0.270***		-0.286***	0.242***	
language						
	(0.0891)	(0.0891)		(0.0922)	(0.0873)	
Colony	0.126	0.806***		0.135	0.834***	

Table 2: Effects of trade liberalisation on EAC's imports: bloc results

Independent variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	(0.0845)	(0.0890)		(0.0888)	(0.0907)	
Common colony	1.053***	-0.168**		1.071***	-0.109	
	(0.113)	(0.0836)		(0.127)	(0.0824)	
EACU				0.233	-0.421	-0.461***
				(0.225)	(0.298)	(0.141)
COMESA				0.0632	0.844***	2.233***
				(0.120)	(0.142)	(0.720)
Constant	-9.529***	22.49***	21.14*	-9.963***	19.81***	20.29*
	(-1.789)	(-2.138)	(11.56)	(-1.916)	(-2.543)	(11.43)
Observations	9,889	9,701	9,889	9,889	9,701	9,889
Fixed effects						
Importer fixed effects	Yes	No	No	Yes	No	No
Exporter fixe effects	No	Yes	No	No	Yes	No
Country-pair fixed effects	No	No	Yes	No	No	Yes

Notes: This table reports estimates of the effects of RTAs on EAC imports as a group. All estimates are obtained with data for the year 2001 to 2018. The dependent variable is bilateral imports. I use importer time, exporter time, and country pair fixed effects to control MRT and endogeneity of variables. All estimates apply PPMLHDFE estimator. Models 1 to 3 indicate the estimates ignoring RTAs. Models 4 to 6 add RTAs on previous regressions. Standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1

4.1.2. Estimating the effects of political violence on imports: bloc results A further factor affecting trade flows in the region is the political crises that are observed in several forms. Here, I am interested in the question "what are the impacts of electoral violence related to first-order election on EAC imports?." I incorporate 'Polcris' dummy variable to capture crises effects in EAC regional trade agreements. For estimation proposes, I consider violent conflict in the importer country, leading us to use importer fixed effects as the variable "Polcris" varies with time. Results are presented in Table 3.

Independent variables	Model 1	Model 2
In GDP importer	0.230	0.161
	(0.277)	(0.272)
In GDP exporter	1.628***	1.624***
	(0.0837)	(0.0827)
In Distance	-1.778***	-1.776***
	(0.139)	(0.138)
In population Importer	-2.501	-2.350
	(-1.569)	(-1.525)
In Exporter population	0.119***	0.119***
	(0.0265)	(0.0263)
In official exchange rate	0.256	0.298
	(0.504)	(0.510)
Similarity	0.784***	0.779***
	(0.0892)	(0.0886)
Contiguity	-0.718***	-0.721***
	(0.180)	(0.181)
Official language	-0.288***	-0.287***
	(0.0923)	(0.0922)
Colony	0.117	0.117
	(0.0915)	(0.0913)
Common colony	1.069***	1.068***
	(0.128)	(0.128)
EACU	0.263	0.269
	(0.215)	(0.215)
COMESA	0.0575	0.0554
	(0.121)	(0.122)
Political crises		0.128
		(0.0919)
Constant	25.85	24.68
	(18.55)	(18.12)
Observations	9,889	9,889
Fixed effects		
Importer fixed effects	Yes	Yes
Exporter fixe effects	No	No
Time effects	No	No

Table 3: Effect of political crises on EAC's imports, bloc results

Notes: This table reports estimates of the effects of political crises on EAC imports. All estimates are obtained with data for the year 2001 to 2018 and apply PPMLHDFE estimator. The dependent variable is bilateral imports. Only estimates obtained absorbing importer unobservable effects are presented for brevity. Standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1
Two findings stand out from the PPMLHDFE estimates of the gravity model reported in Table 3. First, in contrast to the expectations, the coefficient of variable Polcris is not statistically significant, suggesting that the political crises occurred during presidential elections in EAC does not have an impact on imports. Second, and most important, there is no larger difference in the magnitude of coefficients for variables when RTAs are included in the estimation, confirming the consistency of results.

4.2. Estimating the determinants of EAC's imports on individual country

I am now focusing on estimations on individual level. Tables 4 provides details of the disaggregated country effects, using PPMLHDFE estimates. The objective is to compare the magnitude of effects in each EAC member country.

The results in Table 4 reinforces the message from previous estimates suggesting that trade partners incomes increase imports volume in each EAC member as all estimations show a positive and statistically significance coefficients associated with exporter's GDP. Likely, the exporter population is strongly positive in all estimates indicating that EAC imports increase with partners' population. Exception is pointed out in Tanzania where a no statistically significant coefficient is found. Like in bloc results the distance is strongly negative and statistically significant in each EAC member country. This negative effect is stronger in all estimates still confirming the theory of geographic proximity in trade (Krugman, 1991).

Table 4: Effects of trade liberalisation on EAC	C's imports: individual
results	

Independent variables	Burundi	Kenya	Rwanda	Tanzania	Uganda
In GDP importer					
In GDP exporter	3.794***	1.368***	1.735***	1.639***	1.500***
	(-1.130)	(0.0918)	(0.189)	(0.217)	(0.188)
In Distance	-2.014***	-1.683***	-1.380***	-2.241***	-1.401***

Independent variables	Burundi	Kenya	Rwanda	Tanzania	Uganda
	(0.251)	(0.173)	(0.165)	(0.367)	(0.127)
In population					
Importer					
In Exporter	0.166**	0.122***	0.288***	0.000491	0.241***
population	(0.0769)	(0.0425)	(0.0590)	(0.0465)	(0.0411)
In official exchange	(0.0768)	(0.0423)	(0.0389)	(0.0403)	(0.0411)
rate					
Similarity	3.014***	0.419***	1.093***	0.671***	0.708***
	(-1.132)	(0.113)	(0.188)	(0.231)	(0.222)
Contiguity	1.493***	-2.073***	0.356**	-0.308	1.006***
	(0.235)	(0.213)	(0.154)	(0.387)	(0.389)
Official language	0.690***	-0.456**	-0.0709	-0.143	-0.501***
	(0.158)	(0.203)	(0.122)	(0.170)	(0.176)
Colony	0.748***	0.391**	0.532***	-0.254	0.316*
	(0.245)	(0.194)	(0.207)	(0.192)	(0.172)
Common colony	-3.610***	1.268***	-0.233	0.921***	1.450***
	(0.434)	(0.245)	(0.282)	(0.237)	(0.223)
EACU	-0.298	0.806***	0.951***	-1.275***	-0.583
	(0.277)	(0.285)	(0.245)	(0.368)	(0.431)
COMESA	0.360	0.477***	0.126		-1.157***
	(0.252)	(0.163)	(0.165)		(0.344)
Constant	-57.84**	-5.113***	-19.40***	-4.929	-13.24***
	(23.69)	(-1.977)	(-3.253)	(-4.118)	(-4.372)
Observations	1,577	1,834	2,009	2,33	2,139
Fixed effects					
Importer time fixed effects	Yes	Yes	Yes	Yes	Yes
Exporter time fixe effects	No	No	No	No	No
Country-pair fixed effects	No	No	No	No	No

Notes: This table reports estimates of the effects of RTAs on each EAC member country's imports. All estimates are obtained with data for the year 2001 to 2018. All estimates apply PPMLHDFE estimator. The dependent variable is bilateral imports. Only importer time fixed effects estimate results are reported for brevity. Standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1

Like in bloc results, the similarity is strongly positive and statistically significance in each EAC member country. The impact decreases with countries' development levels, indicating that small economies trade mostly among them. The border has positive impacts in landlocked countries such as Burundi, Rwanda, and Uganda while negative impact is reported in countries with direct access to the ocean such as Kenya and Tanzania. These results seem valid since exports to Burundi, Rwanda and Uganda pass mostly through the North and the Central Corridors via Mombasa and Dar-es-Salaam ports respectively (Figure 1 and Figure 2). For instance, in 2018, 80 % of EAC imports consisting of petroleum products, machinery and medicines came from Middle Eastern trading partners including China, India and the United Arab Emirates and pass through Kenya (via the North Corridor) and Tanzania (via the Central Corridor) before being routed to Uganda, Burundi and Rwanda.



Figure 1: EAC Northern Corridor

Source: Nathan Associates Inc. (2009).



Figure 2: EAC Central Corridor

Source: Nathan Associates Inc. (2009).

Another important result in each country's view is related to colonial ties. EAC member countries trade more with their colonisers with the exception to Tanzania where a no statistically significant relationship is reported. Trade relations are strong and significant among anglophone colonies —Kenya, Tanzania, and Uganda— and negative in francophone colonies —Burundi and Rwanda—. Among reasons of this difference in results may include the fact that anglophones countries have developed infrastructures (especially railways and roads) that connect them, resulting in increasing trade among them, which is not the case in francophone countries where any railway is available until now. Having shared the same coloniser has increased trade about 236.69 %, 145.2 % and 320.38 % for Kenya, Tanzania, and Uganda, respectively. Meanwhile, a decrease of over 40 time observed in Burundi.

4.2.1. Disaggregating effects of RTAs on imports: individual results The PPMLHDFE estimates of gravity model in Table 4 show that the customs union has not had a significant effect on Burundi and Uganda's imports while a positive impact is detected in Kenya and Rwanda. It has strong statistically significant effect about 123.89 % and 158.82 % respectively for Kenya and Rwanda. However, a negative effect of -72 % is reported in Tanzania. These results are somehow consistent with results in Buigut (2012).

The coefficients associated with COMESA show a positive impact on Kenya's imports (61.12 %) while a negative impact (-68.55 %) is found in Uganda. Statistically significant coefficients associated with EACU and COMESA in Kenya allow us to confirm that Kenya is the leader to beneficiate from these regional trade arrangements. Kenya takes advantage of its advanced economic level and infrastructures developments —comparatively to other EAC member countries— to beneficiate the most in these agreements. It should be remembered that disproportionate benefice share was among reasons for the collapse of the old EAC.

4.2.2. Disaggregating effects of political violence on imports by EAC country

I am determining in this point if the effects of political crises are equally distributed across EAC member countries. Tables 5 provides details of the disaggregated country effects on imports, using PPMLHDFE estimates. The objective is to compare the magnitude of effects in each country. Columns (2), (3), (4), (5) and (6) represent situation in Burundi, Kenya, Rwanda, Tanzania, and Uganda, respectively.

Independent	Burundi	Kenya	Rwanda	Tanzania	Uganda
variables					
In GDP importer	-1.242	1.026	-0.537	3.084**	-0.260
	(-1.453)	(-1.117)	(0.464)	(-1.224)	(0.354)
In GDP exporter	3.707***	1.261***	1.712***	1.561***	1.701***
	(-1.207)	(0.0862)	(0.191)	(0.198)	(0.170)
In Distance	-2.022***	-1.791***	-1.732***	-2.190***	-1.537***
	(0.103)	(0.150)	(0.0924)	(0.367)	(0.113)

Table 5: Effect of political crises on EAC's imports: individual results

Independent variables	Burundi	Kenya	Rwanda	Tanzania	Uganda
In population	-3.290	-5.148	2.808	-17.00**	0.228
Importer					
	(-4.080)	(-5.702)	(-3.712)	(-7.707)	(-1.700)
ln Exporter	0.177**	0.135***	0.295***	0.000627	0.223***
population	(0.0700)	(0.0410)	(0.0500)	(0.0462)	(0.0402)
	(0.0790)	(0.0418)	(0.0589)	(0.0462)	(0.0402)
ln official exchange rate	0.0635	0.827	-0.820	3.493	-0.598
0	(-1.885)	(-1.245)	(-1.428)	(-2.385)	(0.571)
Similarity	2.947**	0.303***	1.029***	0.590***	0.852***
	(-1.214)	(0.113)	(0.197)	(0.212)	(0.210)
Contiguity	1.122***	-1.490***	0.532***	-1.369**	0.253
	(0.198)	(0.286)	(0.185)	(0.583)	(0.231)
Official language	0.678***	-0.422**	-0.0360	-0.154	-0.427***
	(0.153)	(0.195)	(0.120)	(0.171)	(0.164)
Colony	0.744***	0.320*	0.491**	-0.243	0.236
	(0.241)	(0.193)	(0.203)	(0.191)	(0.160)
Common colony	-3.248***	1.182***	-0.659***	0.936***	1.457***
	(0.463)	(0.226)	(0.238)	(0.242)	(0.204)
Political crises	-0.332**	0.0950	-0.0184	0.190	-0.00951
	(0.156)	(0.106)	(0.113)	(0.230)	(0.113)
Constant	23.13	59.97	-44.03	196.0**	-9.963
	(38.21)	(67.98)	(42.20)	(93.60)	(19.05)
Observations	1,577	1,834	2,009	2,330	2,641
Fixed effects					
Importer fixed effects	Yes	Yes	Yes	Yes	Yes
Exporter fixe effects	No	No	No	No	No
Time effects	No	No	No	No	No

Notes: This table reports estimates of the effects of political crises on each of the EAC member country's imports. All estimates are obtained with data for the year 2001 to 2018 and apply PPMLHDFE estimator. The dependent variable is bilateral imports. Only estimates obtained absorbing importer unobservable effects are presented for brevity. Standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1

Three implications stand out from these results: (i) including "Polcris" variable in regressions does not change considerably the sign and significance of coefficients reported in Table 4. (ii) No significant but negative coefficients are reported in landlocked countries such as Rwanda and Uganda while a no significant but positive coefficient is found in Tanzania. (iii) Contrary to the expectations, no negative impact is found in Kenya. However, a negative impact of is reported in Burundi. The negative impact found in Burundi may result in the failed putsch in 2015 resulting in killings and others political disruptions that led to sanctions from the European Union (EU) and other important partner concerning the suspension of funding. Roads' perturbations and insecurity during the crisis embedded goods transport with the suspension of transport agencies. These results align to findings suggesting a negative impact of various forms of political instability on macroeconomics aggregates (see Aisen and Veiga 2013; Durnev et al., 2012; Guillaumont et al. 1999; Gurgul and Lach 2013). In Kenya in contrast, any impact was found. This may be explained by the country's economic level and surface: the road attacks during crises concern especially the Eldoret road which is located after Nairobi from the Mombasa port.

4.3. Estimating the sensitivity on political instability's impact according to partners' economic level

I am interested in analysing how sensitive is trade —imports— between high-income, upper-middle, lower-middle to lower-income countries with regards to political violence. This will allow us to see the magnitude of effects of election conflicts given partners' economic levels. Results in Table 6 show that the sensitivity of imports to political violence is decreasing function of exporter's economic level.

Independent variables	Model 1	Model 2
In GDP importer	0.189	0.177
	(0.164)	(0.163)
ln GDP exporter	1.540***	1.544***
	(0.121)	(0.123)

 Table 6: Sensitivity of trade within EAC member countries with regards to political crises

Independent variables	Model 1	Model 2
In Distance	-1.826***	-1.759***
	(0.0973)	(0.119)
In population Importer	0.0876	0.0821
	(0.205)	(0.203)
In Exporter population	0.180*	0.195**
	(0.0994)	(0.0980)
In official exchange rate	-0.0584*	-0.0556
	(0.0346)	(0.0343)
Similarity	0.754***	0.781***
	(0.0893)	(0.0878)
Contiguity	-0.566***	-0.731***
	(0.191)	(0.187)
Official language	-0.162*	-0.171*
	(0.0894)	(0.0912)
Colony	0.116	0.130
	(0.0823)	(0.0851)
Common colony	1.132***	1.172***
	(0.108)	(0.117)
EACU		0.320
		(0.208)
COMESA		0.196*
		(0.115)
Political crises # high income exporters	-0.110	-0.0852
	(0.290)	(0.286)
Political crises # upper middle-income exporters	· · · · ·	
Political crises # lower middle-income exporters	-0.432*	-0.472**
	(0.228)	(0.227)
Political crises # lower income exporters	-0.527*	-0.617**
	(0.275)	(0.276)
Constant	-14.70***	-15.23***
	(-1.157)	(-1.219)
Observations	9,889	9,889
Importer fixed effects	No	No
Exporter fixe effects	No	No
Time effects	Yes	Yes

Notes: This table reports estimates of the sensitivity of trade between high, upper middle, lower middle to lower income exporters with regards to political instability. All estimates are obtained with data for the year 2001 to 2018 and apply PPMLHDFE estimator. The dependent variable is bilateral imports of EAC. Model 1 represents estimates results without RTAs effects while in Model 2 all the dependent variables are included in regression. Only estimates accounting for time effects are reported for brevity. Standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1

The impact is no significant for high-income countries and is negatively increasing with the GDP of exporters. For example, the coefficient associated with high income (-0.0865) is statistically not significant while the coefficient associated with low income (-0.567) is negative and statistically significant. These results underlined what I call 'shift of imports' during political crisis; imports will shift from lower income partners to high income partners given the dependence of EAC countries on imports from high-income countries especially petroleum products, machinery, and medicines. In other word, whenever the situation EAC countries need to imports basic products for economic activities from Middle Eastern trading partners including China, India and the United Arab Emirates.

5. Conclusion

Based on the theory of international trade using an extended gravity model, this paper explored the determinants of imports as well as the impact of political violence on EAC's trade. While it may seem difficult to assess the effects of the electoral violence on trade, I apply the augmented gravity model on a sample of 147 countries for the period 2001-2018. I control countries' unobservable characteristics by applying importer fixed effects and country-pair fixed effects. I analysed the effects on individual country and the sensitivity of trade to political crises' effects regarding their origin. Results suggest that the East African Customs Union does not contribute to a significant increase in intra-EAC imports proportionally in all members. Kenya leads to beneficiate from the trade liberalisation in the EAC in enhancing its imports from the region given its advanced economy. Likely, Rwanda is taking advantage of the EAC agreements to increase intra-trade. Tanzania is experiencing negative effects while the EACU has no influence on Burundi and Uganda imports from EAC members. The impact of COMESA agreements is positive in Kenya and negative in Uganda. In addition, trade relationship among members is higher within the COMESA agreement than EAC agreement. Regarding political crises, like the effects of RTAs, political crises have disproportionate effects on EAC member countries' trade. The results suggest that there is no significant impact of political crises in countries that are politically stable such as Tanzania, Uganda, and Rwanda. The

negative effect of political crises found in Burundi is resulting in several forms of internal crises that affect macroeconomics aggregates of the country, especially the failed putsch in 2015 that led to killings, human displacements, and infrastructures' disruptions in the country.

Imports from lower-incomes partners are more sensitive to political crises than imports from high-income exporters. This is resulting in the fact that EAC countries' economic activities mostly depend on imports from highincome (over 80 % of total imports). Given the importance of imports from high-income countries for economic development activities, EAC will continue to import regardless of the situation they face.

I conclude by foregrounding some of the implications of the findings for practice and future research. Firstly, being interdisciplinary, this study is among the first steps on the complex analysis of economic effects of various forms of political crises that shake the Central and Eastern African region. The study provides valuable information on the causes behind stagnation of trade in the EAC. RTAs will not have a positive impact unless measures to establish sustainable peace and security in the region are undertaken. The study underlines the need to sensitize all stakeholders including governments about the importance of peace and security for trade developments. For instance, the community should adopt a joint regional awareness campaign for the citizens, especially the lower classes, to maintain peace and security in the region since they are the ones who suffer from consequences of the violence. These campaigns are essential for all citizens in the region who have no choice but to cooperate and develop jointly, if they want to move forward.

Secondly, for policymakers, the findings of this study shed light on the measures to promote intra and inter EAC's trade. The easiest way is the harmonization of local industrial structures to promote increased domestic production and the full implementation of free trade agreements. Another way is the good allocation of natural resources. These factors will lead to a decrease in the dependence of imports from the rest of the world. Good infrastructures are likely to make a significant contribution to reducing transport and communication costs and increasing trade. Thus, measures

that improve infrastructures' quality and protect existing ones can greatly increase both the bilateral volume and the global volume of trade in goods.

Thirdly for researchers, this study brings a new technique that is more precise and more efficient for exploring RTAs' effects in developing countries where data unavailability is a reality. Most of the existing studies used bilateral exports as dependent variable and applied PPML estimator. This old method raised many problems such as, a high percentage of missing data of the dependent variable and this can lead to bias estimation results. The use of bilateral imports as dependent variable in combination with the PPMLHDFE effects opens debate to the comparability of different techniques used in the field.

However, I must recognize that the failure to capture other factors that may be behind low performance of EAC's trade is the major limitation of this study. It is therefore possible to envisage an extension of this research in the direction of the apprehension of other dimensions to capture the effects of several forms of political instability on trade. Moreover, when more data is available, an econometric analysis of dependencies between trade and political instability in disaggregate sectors and products levels in EAC economies will be an interesting research avenue to extend and supplement the outcomes of this paper.

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ABSTRACT

One key challenge developing countries have been grappling with is how to transform economic gains into improved quality of life. Most extant studies have submitted that quality of life in developing countries can only improve by adopting drafted policy templates from the developed world, which may have little or no socioeconomic resemblance with the adopting developing nation. Thus, this study's objective is to identify policy issues relevant to enhancing the determinants of quality of life: healthcare outcome, environmental factors, food security, income level, and natural resource utilisation in 13 West African countries from 1970 to 2016. Using the panel fully modified ordinary least square approach, the study reveals that healthcare outcomes through high mortality rate, overuse of environmental factors and resulting ecological protection measures, and poor access to high-quality seeds and feeds devalue the quality of life in West Africa. However, higher-income and natural resource utilisation promote the quality of life in the region. Hence, sustained improvement in primary health care provision, diversification of FDI inflows from resource-seeking to knowledge-seeking sectors, shrinking income inequality, and genuine commitment to using natural wealth revenues for progressive spending are considered imperative for quality of life policy efficiency in West Africa.

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ملخص

يتمثل أحد التحديات الرئيسية التي تواجهها البلدان النامية في كيفية تحويل المكاسب الاقتصادية إلى نوعية حياة أفضل.وقد أشارت معظم الدراسات الموجودة إلى أن جودة الحياة في البلدان النامية لا يمكن أن تتحسن إلا من خلال اعتماد نماذج سياسات مصاغة من العالم المتقدم، والتي قد يكون لها تشابه اجتماعي واقتصادي ضئيل مع الدولة النامية المتبنية أو لا يوجد بها أي تشابه. وبالتالي، فإن هدف هذه الدراسة هو تحديد القضايا المتعلقة بالسياسات ذات الصلة بتعزيز محددات جودة الحياة: نتائج الرعاية الصحية، والعوامل البيئية، والأمن الغذائي، ومستوى الدخل، واستخدام الحياة: نتائج الرعاية الصحية، والعوامل البيئية، والأمن الغذائي، ومستوى الدخل، واستخدام الموارد الطبيعية في 13 دولة في غرب أفريقيا من 1970 حتى 2016. وباستخدام نموذج لوحة المربعات الصغرى العادية المحدلة بالكامل، تكشف الدراسة أن نتائج الرعاية الصحية من خلال معدل الوفيات المرتفع، والإفراط في استخدام العوامل البيئية وتدابير الحماية البيئية الناتجة، وضعف مستوى الوصول إلى البذور والأعلاف عالية الجودة تقلل من جودة الحياة في غرب أفريقيا. ومع ذلك، فإن استخدام الدخل المرتفع والموارد الطبيعية يعزز جودة الحياة في غرب أفريقيا. ومع ذلك، فإن استخدام الدخل المرتفع والموارد الطبيعية يعزز جودة الحياة في البيشية الناتجة، وضعف المعتمر في توفير الرعاية الصحية الأولية، وتنويع تدفقات الاستثمار الأجنبي المار الواردة من فإن استخدام الدخل المرتفع والموارد الطبيعية يعزز جودة الحياة في المنطقة. ومن ثم، فإن التحسين ماستوى الومول إلى البذور والأعلاف عالية الجودة تقل من جودة الحياة في غرب أفريقيا. ومع ذلك، والزن استخدام الدخل المرتفع والموارد الطبيعية يعزز جودة الحياة في المنطقة. ومن ثم، فإن التحسين ماستمر في توفير الرعاية الصحية الأولية، وتنويع تدفقات الاستثمار الأجزي المان الواردة من فإن استخدام الدخل المراحية عان المونية عزر خودة، وتقليص عدم المساواة في الدخل، والالزام المحت عن الموارد إلى قطاعات البحث عن المرفية، وتقليص عدم المساواة في الدخل، والالزام المعنان كفاءة السياسة المتعلقة بجودة الحياة في غرب أفريقيا.

ABSTRAITE

L'un des principaux défis auxquels les pays en développement sont confrontés est de savoir comment transformer les gains économiques en une meilleure qualité de vie. Selon la plupart des études existantes, la qualité de vie dans les pays en développement ne peut s'améliorer qu'en adoptant des modèles de politiques élaborés dans le monde développé, qui peuvent avoir peu ou pas de ressemblance socio-économique avec le pays en développement qui les adopte. Ainsi, l'objectif de cette étude est d'identifier les questions politiques pertinentes pour améliorer les déterminants de la qualité de vie : résultats des soins de santé, facteurs environnementaux, sécurité alimentaire, niveau de revenu et utilisation des ressources naturelles dans 13 pays d'Afrique de l'Ouest entre 1970 et 2016. En utilisant l'approche des moindres carrés ordinaires entièrement modifiée par panel, l'étude révèle que les résultats en matière de santé à travers un taux de mortalité élevé, la surutilisation des facteurs environnementaux et les mesures de protection écologique qui en découlent, ainsi que le faible accès à des

semences et à des aliments pour animaux de haute qualité dévalorisent la qualité de vie en Afrique occidentale. En revanche, les revenus élevés et l'utilisation des ressources naturelles améliorent la qualité de vie dans la région. Par conséquent, l'amélioration soutenue de l'offre de soins de santé primaires, la diversification des flux d'IDE des secteurs demandeurs de ressources vers les secteurs demandeurs de connaissances, la réduction des inégalités de revenus et un véritable engagement à utiliser les revenus des richesses naturelles pour des dépenses progressives sont considérés comme impératifs pour l'efficacité des politiques de qualité de vie en Afrique de l'Ouest.

Keywords: Environment; Food security; Health outcome; Quality of life;

Resources, West Africa.

JEL Classification: I18, I31, I38.

1. INTRODUCTION

One common ground among researchers has been the fact that the term Quality of Life (QoL), can be viewed from different perspectives, such as well-being, a good life, happiness, and a fulfilled or valued life (McCrea, Shyy and Stimson, 2006). QoL's multifaceted nature has also led to researchers' use of various measures in its estimation. One of such measures has been the extensive use of life expectancy at birth, countries with improved living conditions end-up having citizens with potential elongated lifespans. Nevertheless, regardless of the cultural differences that abound between and within countries, every nation's constituted authority has all its functions embedded in the primary goal of improving QoL for its citizens. Failure to actualise this goal usually ends in social strife and an increase in criminality in societies. Today, many governments, especially those in the developing world, tend to magnify any bit of growth in the economy; as if to say such growth are indications of a better or improved life for their citizens and to legitimise further their stay in power (Aladejare, 2020). However, improved economic growth cannot be an indication of improved QoL in a country. The latter can only be attained when economic growth translates to improved social and economic infrastructure.

In this light, in the past two decades, the West African region have recorded impressive economic growth rates (OXFAM International,

2019). That by 2018, six of the ten fastest-growing economies in Africa, which are: Benin, Burkina Faso, Cote d'Ivoire, Ghana, Guinea and Senegal, were located in the region (OXFAM International, 2019; Ebi and Nyong,2020). Cote d'Ivoire, Ghana, and Senegal were among the world's ten fastest-growing economies as of 2018 (Coulibaly, 2019). However, in most countries in the region, high economic growth has not translated into improved QoL. For instance, Cote d'Ivoire, Nigeria, Mali, Mauritania, Liberia, Sierra Leone, Guinea, and Niger, were among the world's 17 lowest-ranked countries in QoL using the Social Progress Index (SPI) (Business Insider, 2016). In addition, Nigeria, with the largest economy and population in the region was declared the world's leader in the number of under-5 mortality rates by the United Nations International Children's Emergency Fund (UNICEF) in 2020 (UN IGME Report, 2020). This was when such health condition was dropping in other parts of Africa and the world. The region is also home to the highest population living on less than \$1.90 per day in Africa (OXFAM International, 2019). By 2018, 14 of the 32 African countries which ranked lowest on the Human Development Index (HDI) were in West Africa (UNDP, 2019).

Hence, one major challenge developing nations such as those in West Africa have been trying to surmount is how to transform economic gains into improved QoL. Policies aimed at improving QoL in these developing countries are often drafted based on some foreign templates which may have little or no relation to the socioeconomic characterisation of the country. For instance, Schmidt and Bullinger (2007) noted that most often, the determinants of QoL were developed in advanced countries and only subsequently adapted to developing countries. Hence, such measures are more generally concerned with health issues, making their adaption by developing countries yield less than the desired impact. Recently, there have been calls to rethink some of these determinants, especially in Africa, by its stakeholders by considering the socioeconomic peculiarities of African countries for policy effectiveness. These measures have been reflected in the review of related policy documents, such as the Algiers Convention on the conservation of nature and natural resources (1969-2002), whose review is known as the Maputo convention (2003-2017). Another is the African Health Strategy (2007-2015) which was later reviewed for 2016-2030. Despite the aim of giving African colouration to these policies, they are yet to be ratified by most countries on the continent and especially in West Africa. The intuition for this could be that most stakeholders, particularly in West Africa, might consider implementing these policies retarding to the already poor QoL in their countries. Extant literature has theoretically proposed diverse views regarding what should constitute QoL measures for policy development. Prominent amongst these indicators are health outcome, income level, quality nutrition, environmental conditions, and natural resource utilisation. However, in low and middle-income countries to which West African countries belong, poor resource management, food insecurity, an undiversified economy, and over-reliance on primary exports contribute to rendering the government's efforts to improve the QoL ineffective. Hence, the dream of a dignified life through access to quality healthcare, education, sanitation, water, security, jobs, etc., often appears like a mirage.

Therefore, the objective of this study is to determine the critical policy issues related to the five major determinants of QoL in West Africa that should be addressed for QoL policy effectiveness. The first is health care outcome, which is primarily visible in the level of mortality rate. The high mortality rate connotes poor access to healthcare, poor population health, high per capita cost of healthcare, and increasing clinician and health staff stress, all prevalent in West African countries. Second is the effect of environmental factors; these factors are units of different natural areas required to aid an economy. They provide food for West Africans and serve as primary sources of energy and employment for the majority of the citizens. Therefore, pollution from overuse of environmental resources, and policies aimed at improving the environment's quality, either at regional or national levels, will continue to impact on QoL inversely; unless alternative employment in the secondary and tertiary sectors of the economies of countries within the region are being scaledup. Third, food security is essential to improving QoL in West Africa. However, malnutrition is still a major challenge despite the prevalence of arable farmland in the region. Most of the food crops produced and consumed are of low quality, lacking in essential vitamins and iron, and diary nutrients, which increases dietary deficiency and a decline in QoL (Elbehri et al., 2013). Fourth, the poor income level in West African countries has continued to widen the income inequality gap, thereby exacerbating the poor QoL. More West Africans are increasingly becoming less self-fulfilled and satisfied. Poor income has forced increased consumption of low quality food for survival, limited access to good healthcare, good job, reasonable accommodation, and quality

education. Fifth, West African governments rely on natural resource utilisation for QoL enhancement. Hence, sincere, committed use of natural resource revenues for progressive spending on social and economic infrastructure is imperative (Ebi and Nyong, 2021). Without these issues first being addressed, QoL policy measures in West Africa will continue to lose efficiency.

The rest of the study is structured as follows: Section two has a brief literature review, Section three describes the study data and methodology, Section four contains the empirical findings and discussion of findings; and Section five captures the concluding remarks and recommendations of the study.

2. LITERATURE REVIEW

A number of theories have proposed what should constitute measures of QoL, especially for public policy formulation. However, two particular views were considered relevant for this study due to their essential appeal to developing countries. They are succinctly discussed as follows.

2.1 The Objective Indicators Approach

Researchers have defined the objective indicator in relation to measurable economic indicators. These indicators range from income level, cost of living, employment and unemployment figures; to data covering aspects of life and living conditions such as housing tenure/homeownership type, access to consumer durables, overcrowding, social engagement, leisure activities, healthcare outcomes, environment and pollution, crime rates, etc. (Brown et al., 2004).

The Nordic living conditions surveys, as prevalent in Scandinavian countries, are popularly known to be anchored on the objective approach (Johansson, 2002; and Veenhoven, 2002). There are also other countries who choose to evaluate their critical living conditions in line with the process. For instance, the British Labour Government expressly launched QoL monitoring indicators by adapting 15 indicators designed by the public, business and environmental groups. Included indicators were economic output, investment level, employment rate, poverty level, educational level, life expectancy, housing, rate of violent crime, car crime/burglary, road traffic, climate change, environmental quality measures, etc. (DEFRA, 2002).

2.2 The Fulfilment of Basic Human Needs Approach

Some researchers of QoL integrate a needs-based fulfilment model, founded on Maslow's (1954) order of shared human needs, essential for maintenance and survival. These needs, according to Maslow, can be grouped into physiological, safety and security, social belonging, ego, status and self-esteem, and self-actualisation needs (Brown et al., 2004). In addition, Maslow stated that once individuals achieve these fundamental needs, their quest for higher needs such as self-actualisation, happiness and self-esteem are activated. Hence, in modelling QoL, essential human needs and satisfactory accomplishment should constitute its core. It is for this purpose that the vulnerable groups expect the fulfilment of their fundamental needs to be paramount in every society. Thus, access to food, personal care satisfaction, the safety of life and property, should constitute the significant priorities used for evaluating the effectiveness of social care, alongside social engagement and control over daily life (Netten et al., 2002). It has been observed that the fulfilment of human needs approach is widely adopted particularly when assessing the QoL of individuals with mental health challenges, coupled with evaluations of global well-being (Bowling, 2001). To further comply with a needs model of QoL, the perceptual needs indicators have additionally been proposed by researchers. The aim is to push for a model that goes beyond sole dependence on welfare indicators to incorporating individuals' subjective assessments of their objective circumstances and their right to information and advice, money, and right to own or access tangible goods and services (Rettig and Leichtentritt, 1999).

Both the objective and fulfilment of basic human needs theoretical proposition on what should constitute the QoL can be adapted to West African countries, given that the socioeconomic characteristic of these countries is considered. For instance, the fulfilment of basic human needs theorem is believed to be more applicable to people with mental health in the developed world. However, factors that give rise to mental health issues in the developed world such as low income, poor access to healthcare, poor life expectancy, overcrowding, environmental pollution, poor leisure, etc., as the theories propose, are common phenomena in West African countries.

2.3 Empirical Review

A number of studies have tried to identify key factors to consider when formulating policies aimed at improving the QoL in developing countries.

One visual similarity in these studies is the use of life expectancy as a proxy for QoL, which this study also adopted. Furthermore, the most prominent factors in these studies for QoL policy formulation in developing countries can be summarised as food security, income level, and public investment in health and education infrastructure. These primary factors were also considered in this study alongside environmental effects, which seldomly exist in the literature, particularly for West Africa. The reviewed studies are as follows.

Factors that impacted life expectancy at birth in 33 Sub-Saharan African (SSA) countries were conducted by Fayissa and Gutema (2005). Substantial impacts from socioeconomic and environmental determinants such as literacy rate, food availability per capita, alcohol intake, health spending, carbon emissions per capita, and urbanisation were noted as the major determinants of life expectancy. The study findings indicated that food availability per capita, urbanisation, and literacy rate positively affect life expectancy in the SSA countries. On the other hand, increased alcohol intake, carbon emissions per capita, and health spending were reported to have inversely affected life expectancy. The inverse effect of health spending was strongly associated with the prevalent inefficient health service provision systems in the SSA countries.

Kabir (2008) considered ten factors usually touted as significant for boosting life expectancy in a sample of 91 developing countries. The study findings showed that most of these factors were insignificant in improving life expectancy in these countries. Thus, the conclusion is that although factors such as growth in per capita real income, improved spending on health and education, access to safe drinking water, and proper population planning may have strong policy implications for developing countries, they may not promote higher life expectancy. Rather, the study recommended that if issues related to healthcare outcome, undernourishment, fertility rate, population control, and high level of public indebtedness are addressed, particularly in poor SSA countries, life expectancy might be improved.

Lin et al. (2012) considered political and social factors in improving life expectancy in 119 less developed countries. The study found a relatively small short-term effect of democracy on life expectancy; however, it stated that the long-term effect should not be underestimated, especially in African countries. Economic development and improvement in nutritional needs were the main factors to have had more significant short and long term effects on life expectancy in the study's results.

Camfield (2012) made a strong proposition to elaborate subjective QoL research in developing countries, particularly the adoption of individual QoL indicators. However, the study also highlighted the significant challenges associated with formulating, adapting and using indicators of subjective QoL in developing countries. Since the study submits that assessing an individual's QoL is explicitly an ethical priority, hence, the singular use of measures such as gross national product (GNP) per capita could be highly misleading.

The study by Bayati et al. (2013) observed that life expectancy in Eastern Mediterranean countries was significantly and positively boosted by factors such as growth in per capita income, investment in education, food accessibility, level of urbanisation, and job creation.

In the study by Sede and Ohemeng (2015), traditional determinants of life expectancy in developing countries, such as public health spending, per capita income, and secondary school enrolment, were reported not to be significant for improving life expectancy in Nigeria. However, the unemployment and nominal exchange rate levels showed a substantial impact on life expectancy. In another related study for Nigeria, Benjamin and Jegede (2018) found substantial positive effects of sustainable development, secondary school enrolment, the level of investment, inflation rate, income pattern, and political dummy on QoL (proxied by aggregate consumption expenditure).

Although Guisan and Exposito (2016) observed that there has been significant improvement in life expectancy in many African countries, the level was, however reported to be lower in comparison with the World average. Nevertheless, the improvement was attributed to the positive effects of education, and economic development, which vary across countries due to geographical location, social characteristics, health assistance, sanitation infrastructures, etc. Health-related outcomes such as HIV/AIDS, influenza and pneumonia, etc., were mainly found responsible for the below World average life expectancy rates on the continent.

Furthermore, the African Development Bank (2016) report admitted that while most African countries have made substantial progress towards improving the QoL for their citizens, such progress had not been sufficient compared to other developing countries. The basic needs approach was adopted in the bank's evaluation of QoL policies in African countries. Six basic needs indicators comprising life expectancy, educational enrolment, technical/vocational training enrolment, the level of the unemployment rate, access to improved water sources and sanitation infrastructure were used. The report concluded that while African countries have recorded significant growth in their economies, such growth has not been able to boost health, and education, create jobs, and improve access to water and good sanitation in most countries. In a related study, Hassan et al. (2017) found substantial effects from access to water, improved sanitation, GDP, health spending, and education on life expectancy in 108 developing countries.

Wu et al. (2017) also noted that in spite of the growth in income and economy of China, food safety and air pollution are still of primary importance to the Chinese middle-income class, and for China's leaders to legitimately assert their regime. This is because both factors constitute the prominent measures for QoL politics and policy determination in the country.

Nanor et al. (2018) analysed QoL measurement from a subjective perspective for residents of Kumasi, Ghana. Factors that constituted the main subjective elements were health, economic power, and neighbourhood and housing. By using these measures, the study found that the subjective QoL of Kumasi residents was above average. It was further noted by the study that subjective QoL measures can be adopted as urban planning equipment in tackling problems peculiar to the management of urban centres, while the outcomes of such measurements may present the needed basis for constructing future spatial and urban planning policies.

The study by El-Aswad (2019) used multiple important objective and subjective indicators to evaluate and compare the QoL and well-being of Middle Eastern and Northern African countries. The objective indicators included healthcare outcomes assessed from the perspective of life expectancy at birth and infant and maternal mortality rates. Educational level was evaluated based on years of schooling, adult literacy, and

enrolment rates, and economic standard of living was assessed using the level of gross domestic product (GDP) per capita. As for the subjective measures, individuals' states of subjective well-being, which include life fulfilment, level of happiness, and absence of ill-being, were employed. The study specifically noted that healthcare outcome, level of education, economic progress, and technology should be critical in QoL policy formulation in the studied countries due to their substantial impacts.

Dumith et al. (2021) investigated QoL levels and assessed the impact of social determinants on adults' QoL residing in southern Brazil's urban areas. The study found the QoL to be unevenly distributed and worse for disadvantaged subgroups. However, the study suggested that intersectoral policies aimed at lowering social inequality can potentially heighten the population-level QoL in the region.

Paloma et al. (2021) identified the core factors that affect the life satisfaction of economic migrants arriving from developing nations and residing in welcoming societies that possess high HDI. The study suggests that economic migrants' life satisfaction is helped by twelve determining factors grouped into three classes of structural integration, social and cultural inclusion, and individual strengths.

Aladejare (2022) examined the nexus between human well-being and environmental degradation in 29 African countries. Human well-being indicators such as globalisation, life expectancy and human capital development were reported to be environmentally enhancing. However, urbanisation and growth in income, and natural resource rent were found to be ecologically degrading. Also, a bidirectional relationship between the human well-being indicators and environmental degradation was also confirmed. Consequently, the study noted that the human well-being indicators could only improve the quality of life through a beneficial symbiotic relationship between the former and the environment in African countries.

3. DATA AND METHODOLOGY

3.1 Data

For this study's empirical analysis, panel data from 13 West African countries spanning from 1970 to 2016 was utilised. These countries are Benin, Burkina Faso, Cote d'Ivoire, Gambia, Ghana, Guinea-Bissau,

Mali, Mauritania, Niger, Nigeria, Senegal, Sierra-Leone, and Togo. The selection of these countries was based on date availability.

Although the human development index (HDI), which combines four key measures of education, human capital, health, and standard of living would have suffix as a better indicator for QoL. However, HDI data unavailability for the chosen timeframe for most West African countries constrained its adoption in this study. Hence, a future path in enriching the literature will be to see how HDI responds to variations in QoL determinants in West Africa. Nevertheless, to circumvent this limitation, QoL in this study is evaluated using life expectancy at birth. Its adoption was based on the intuition that life expectancy is a function of individual lifestyle choices or habits, which are substantially based on response to incentives from other factors. This study narrowed down these factors to five peculiar components considered essential for QoL policy formulation in West Africa. They are healthcare outcome, environmental quality, food security, level of income, and natural resource utilisation.

To capture healthcare outcomes, the infant mortality rate per thousand live births was adopted. The mortality rate constitute a crucial aspect of population health outcome evaluation. Furthermore, governments and healthcare organisations such as the UNICEF and the World Health Organisation (WHO) have healthcare outcome measures such as mortality rate as their primary quality and cost targets they try to improve. Environmental factors were proxied by adopting ecological footprint consumption per capita. Ecological footprint represents a unique measure which considers the unit of different natural areas required to aid an economy. These natural areas include built-up land, carbon space, cropland, fishing grounds, forest products, and grazing land. It is important to note that the bulk of the West African population relies on the environment not just for food but for a cheap source of energy (i.e., firewood fetching) and employment in farming, hunting, lumbering, fishing, and mining. Noteworthy in the literature is a shortage of studies that have adopted ecological footprint in measuring environmental factors related to West Africa. Hence, making the use of this measure a further contribution to knowledge.

Food security is measured using the food price index. The concept of food security has undergone diverse revisions over the last three decades, growing from primary food supply to include stability and affordability.

Hence, for an efficient QoL policy formulation and implementation in West African countries, there is a need to ensure constant physical and economic access to basic food nutritional requirements necessary for healthy living. Another vital factor to consider in QoL policy formulation is income, which was measured using the GDP per capita growth rate. Intuitively, it is expected that growth in income level should translate to better QoL in a country. Stress and depression can be related to issues of poor income level, capable of reducing the QoL in a country. Hence, to evaluate individuals' happiness and self-fulfilment in West African countries, growth in GDP per capita can be used. Natural resource utilisation is the fifth important component and was measured using the total natural resources rents as a share of GDP (tny). It is the aggregation of rents collected by the government from exploring natural resources such as gas, oil, coal, mineral deposits, and forest products richly available in the West African region (Aladejare, 2020). To improve the QoL in the region, proceeds from these natural resources that constitute the bulk of West African governments revenue are usually deployed for provision of schools, hospitals, jobs, security, good drinking water, and sanitation infrastructure.

Table 1: captures the measurement of each indicator used in the study and its sources.

Variable	Measurement	Sources	Symbol
Quality of birth	Life expectancy at birth	WDI (2021)	le
Health care outcome	Infant mortality rate per 1000 live births	WDI (2021)	ipt
Environmental	Ecological footprint	Global	ef
factors	global hectare (gha) per	footprint	
	capita	network	
		(2021)	
Food security	Food price index	WDI (2021)	fpi
Income level	GDP per capita growth	WDI (2021)	дур
	rate		
Natural resource	Total natural resource	WDI (2021)	tny
utilisation	utilisation per GDP		

Table 1: Variable measurement and description

Source: Authors' computation.

3.2 Methodology

For the purpose of deriving the long-term effects of the identified primary determinants of QoL, the Fully Modified Ordinary Least Square (FMOLS) approach as introduced by Pedroni (2001) was adopted. This estimation technique was preferred to the conventional OLS due to the latter's proneness to second-order asymptotic bias and serial correlation challenges. Thus, the FMOLS corrects this deficiency associated with the OLS, making it a more robust estimator. In addition, the first difference integration of all the study variables (see Table 4 analysis) further lend credence to the application of the FMOLS procedure over the OLS; since the latter assumes independence across observations for the first difference residuals.

Thus, the panel FMOLS regression equation is presented as:

$$le_{i,t} = \propto_{i} + \beta_{1i}ipt_{i,t} + \beta_{2i}ef_{i,t} + \beta_{3i}fpi_{i,t} + \beta_{4i}gyp_{i,t} + \beta_{5i}tny_{i,t} + \sum_{k=-K_{i}}^{K_{i}} \gamma_{i,t} \Delta ipt_{i,t-k} + \sum_{k=-K_{i}}^{K_{i}} \delta_{i,t} \Delta ef_{i,t-k} + \sum_{k=-K_{i}}^{K_{i}} \tau_{i,t} \Delta fpi_{i,t-k} + \sum_{k=-K_{i}}^{K_{i}} \rho_{i,t} \Delta gyp_{i,t-k} + \sum_{k=-K_{i}}^{K_{i}} \varphi_{i,t} \Delta tny_{i,t-k} + \varepsilon_{i,t}$$

$$(1)$$

where all variables remain as previously defined in table 1, and $-K_i$ and K_i denote the leads and lags, respectively. The panel FMOLS estimation for each regressor can be built-up as follows:

$$\hat{\beta}_{iptFMOLS} = I^{-1} \sum_{i=1}^{I} \hat{\beta}_{FMOLS,i}$$
(2)

where $\hat{\beta}_{=FMOLS,i}$ is the panel FMOLS estimator.

4. EMPIRICAL FINDINGS AND DISCUSSION OF FINDINGS

4.1 Preliminary Analysis

Table 2 reveals that the average life expectancy in the West African region is about 50.6 years. This value falls short of the WHO Global average of 72.0 years and the WHO African Region average of 61.2 years in 2016 (WHO, 2016). The infant mortality rate per 1000 births averaged 101.7, against the WHO African Region average of 76 (WHO, 2016). Also, the average ecological footprint for the region is 1.38, which is less than 2.75 and higher than 1.22 values for the World and Africa's average, respectively, in 2016 (GFP, 2019). The food production index averaged 74.3, which is low, given the availability of enormous uncultivated land in most countries in the region. Growth in GDP per capita is less than 1%. The average total national resource rent per GDP is about 9.8%; suggesting less resource exploration and extractive projects development in the region.

Statistics	le	ipt	ef	fpi	дур	tny
Mean	50.5894	101.6787	1.3762	74.2875	0.6574	9.8436
Max.	67.1460	195.2000	3.2711	201.220	22.1823	54.3795
Min.	32.3880	33.8000	0.9111	23.9200	- 29.4616	1.2661
Std. Dev.	7.0753	34.9842	0.3832	36.0988	5.0502	7.6204
Obs.	611	611	611	611	611	611

 Table 2: Descriptive statistics

Source: Authors' computation.

Table 3 shows the correlation test with evidence of less multi-collinearity between the study variables. However, the high negative correlation between life expectancy and the infant mortality rate is expected, since a high infant mortality rate would also translate to lower life expectancy and vice versa.

	le	ipt	ef	fpi	дур	tny
le	1					
ipt	-0.9095	1				
ef	0.2774	-0.1756	1			
fpi	0.6366	-0.7276	0.0854	1		
дур	0.0577	-0.0482	0.0370	0.1612	1	
tny	0.1439	-0.0570	0.3137	0.2228	0.0896	1

Table 3: Correlation matrix

Source: Authors' computation.

Contained in Table 4 are five different CD tests conducted. They are the Breusch–Pagan Chi-square or non-parametric test, Pearson Langrage-Multiplier (LM) normality test, Pearson CD normality test, Friedman Chi-square test, and the Frees normality test. Observations from the probability values of the five tests indicate that the null hypothesis of cross-sectional independence is rejected. Stating otherwise, there is a significant level of cross-sectional dependence between West African countries.

Table 4: Cross-sectional dependence test

Test	Statistic	d.f	Prob.	
Breusch-Pagan Chi-				
square	152.8419***	78	0.0000	
Pearson LM Normal	4.9513**		0.0000	
Pearson CD Normal	6.9204***		0.0000	
Friedman Chi-square	114.6603***	46	0.0000	
Frees Normal	0.3851***		0.0001	

Where ** and *** indicates significance at 5% and 1% respectively. **Source:** Authors' computation.

4.2 Unit Root Test

In handling dynamic heterogeneous panel dataset, especially when T>30, it is not uncommon to subject the relevant series to panel unit root test. Thus, two unique sets of panel unit root tests were considered in this study. The first category, as shown in Table 4, is the first generation panel unit root tests comprising Levin, Lin and Chu (LLC), Breitung, Fisher Augmented Dickey-Fuller (ADF), Fisher Phillips-Perron (PP), and the Im, Pesaran, and Shin (IPS) tests. However, due to the failure of these tests to incorporate cross-sectional effects in their unit root process, a second category was introduced and used to judge the stationarity of the variables. In the second category are cross-sectional augmented Dicky Fuller (CADF) and cross-sectional Im–Pesaran–Shin (CIPS) panel unit root test by Pesaran (2007). Both tests are known to incorporate cross-sectional effects in their unit context by Pesaran (2007). Both tests are known to incorporate cross-sectional effects in their unit cross-sectional effects

Evidence from Table 5 shows the divergence in the first generation unit root test outputs with stationarity at level, first difference, and nonstationarity. However, the superior CADF and CIPS unit root tests (which incorporate CD effects) show that the series is all stationary at first difference. Hence, the conclusion is that the panel variables are first difference stationary.

Level form	First generation unit root test						
	LLC	Breitung	Fisher-ADF	Fisher-PP	IPS W-stat		
le	- 3.6275***a	0.3819	88.6421***a	7.9797	-5.7825***a		
ipt	-1.1006	-2.5559*** ^b	40.1197**a	18.2674	-2.7154*** ^b		
ef	5.3338	-2.3301***b	139.114*** ^b	97.9013***a	-9.5382*** ^b		
fpi	3.3591	0.0623	122.894*** ^b	46.8251***a	-8.8401*** ^b		
дур	20.8538	-2.9324***a	88.6436***a	422.379*** ^a	-6.4931***a		
tny	6.0153	-1.5061*b	79.4628*** ^b	52.1432***a	-5.7608*** ^b		

Table 5: Unit root test

Second generation unit root test						
	CADF	CIPS				
le	-5.971*** ^b	-1.672**b				
ipt	-3.639*** ^b	-2.578*b				
ef	-4.549*** ^b	-3.136*** ^b				
fpi	-3.099*** ^b	-3.665*** ^b				
дур	-3.655*** ^b	-6.140*** ^b				
tny	-3.573*** ^b	-2.856**b				

A and b indicate stationarity at level and first difference, respectively, and *, **, *** indicate significance at 10%, 5%, and 1%, respectively. **Source:** Authors' computation.

4.3 Cointegration Test

After determining the stationarity of the series, the following approach is ascertaining the long-term association between the variables. The Pedroni and the Kao residual-based cointegration tests were employed to accomplish this. A peculiar advantage of the Pedroni cointegration test lies in its integration of the heterogeneity of cross-sections by utilising defined unrestricted parameters across individual cross-sections of the sample (Pedroni, 1999). The Kao residual-based cointegration test was only used to reaffirm cointegration between the variables. Hence, both cointegration test outputs in Table 6 indicate that the panel variables comove in the long term.

Panel A: Pedroni		Statistic	p-value
test			
	Modified Phillips-	5.0656***	0.0000
	Perron test		
	Phillips-Perron test	4.8048***	0.0000
	ADF test	6.1999***	0.0000
Panel B: Kao test			
	Modified DF	-1.4764*	0.0699
	DF test	-2.2028**	0.0138
	ADF test	-1.8625**	0.0313
	Unadjusted Modified	1.6214*	0.0525
	DF		
	Unadjusted DF	-1.0571	0.1452

 Table 6: Panel cointegration outputs

Where *, **, *** indicates significance at 10%, 5%, and 1% respectively. **Source:** Authors' computation.

4.4 Panel FMOLS Findings and Discussion of Findings

The panel FMOLS in Table 7 show that all the variables significantly affect QoL. The healthcare outcome measure reveals an inverse effect on QoL. Indicating that increase in poor access to primary healthcare, child and maternal care, and antiretroviral drugs for HIV treatment diminishes QoL in West African countries. This finding is in line with the results Kabir (2008), Guisan and Exposito (2016), and El-Aswad (2019) that if issues related to healthcare outcomes, are addressed, particularly in poor SSA countries, then QoL might be improved.

Likewise, the coefficient for environmental factors shows an inverse effect with QoL. This output is plausible and aligned with the findings of DEFRA (2002) and Fayissa and Gutema (2005), who identified environmental quality measures as an essential determinant of Qo. Given that the bulk of the West African population relies on the environment not just for food but for a cheap source of energy (i.e., firewood fetching) and employment in farming, hunting, lumbering, fishing, mining, etc. Hence, overuse of environmental factors leads to an increase in the levels of emanating pollution, which diminishes QoL. On the contrary, adopting measures directed at improving and protecting the environment means denying many people their means of livelihood and further worsens their QoL. This could be why the Maputo Convention on the conservation of nature and natural resources (2003-2017) was not ratified, especially by

most West African heads of state. Thus, without increased employment in the secondary and tertiary sectors of West African countries' economies, getting out of the environmental poverty trap may continue to be a daunting challenge for the region.

Also, the food security measure reveals a negative effect on QoL. Thus, indicating that despite the increase in food production, QoL is worsening. It is important to note that countries in the West African region occupy a vast range of agro-ecological systems, from arid to semi-arid, sub-humid and humid climates (Elbehri et al., 2013). Consequently, food production and consumption are a function of these climates. Consumption patterns are also known to vary based on country location and even within the same country that possesses different climatic characteristics. However, cereals (mainly sorghum, rice, maise and millet) and roots and tubers (mainly cassava and yam) constitute the dominant food crops produced and consumed by the majority of the population (Elbehri et al., 2013). Consumption of other food groups such as fruits, dairy products, meats, potatoes, fish, vegetables and vegetable oils are occasionally consumed due to fast-growing income inequality in the region (see; OXFAM International, 2019); and consequently creating nutritional deficiency, which devalues QoL.

Furthermore, the production of high-quality food and dairy products depends on farmers' access to high-quality seeds and feeds. Frequently, much of the food crops produced in West Africa are self-consumed, with two-thirds of production-consumption occurring among the rural populace (Elbehri et al., 2013). Thus, when farmers cannot access high-quality seeds and feeds, and there is an increase in demand for low-quality food, dietary diversity and QoL is lowered.

Growth in income level appears to have a positive effect on QoL. Suggesting that a higher income level will translate to improved QoL; since income-related stress and depression will be eliminated. Thus, higher-income has the tendency to promote individuals' level of happiness and self-fulfilment and, accordingly, improve QoL in West African countries. For instance, the 2013 World happiness report had the five best-ranked West African countries as Nigeria (82nd), Ghana (86th), Sierra-Leone (127th), Burkina Faso (131st), and Mali (132nd), from a total of 156 countries (World Happiness Report, 2013). At the same time, the *gyp* for these countries was 3.05% (Nigeria), 7.77% (Ghana), 6.51%
(Sierra-Leone), and 3.00% (Burkina Faso), and -0.48% (Mali) (WDI, 2019). However, in the 2017 happiness report, the ranking was Nigeria (95th), Ghana (131st), Sierra-Leone (106th), Burkina Faso (134th) and Mali (127th) (World Happiness Report, 2017); while their corresponding *gyp* for the period was -0.23%, 0.53%, -5.42%, 1.69%, and 3.19% respectively (WDI, 2019).

Similarly, the natural resource utilisation measure appears to have a positive effect on QoL. Supporting the notion that revenue from natural resources is relied upon in West African countries for infrastructure development in health, education, road, water and sanitation, and provision of security for QoL improvement. Nevertheless, the lower value of the coefficient suggests less resource utilisation due to insufficient capacity to exploit, over-dependence on specific resources or both. Thus, West African stakeholders may be sceptical of any resource management policy at the continental or regional levels, which might want to regulate natural resource use and access.

Dependent variables: <i>le</i>			
Regressor	Coefficient	Std. error	Prob.
ipt	-0.2439***	0.006661	0.0000
ef	-1.7353***	0.026458	0.0000
fpi	-0.1341***	0.023777	0.0017
дур	0.3770***	0.050315	0.0000
tny	0.0766**	0.033154	0.0458
Adj.R – squared	0.8985		

Table 7: Panel FMOLS estimated output

Where ** and *** indicate significance at 5% and 1%, respectively. **Source:** Authors' computation.

5. CONCLUSION

QoL represents "well-being" and what constitutes the benchmarks of "the good life." How efficient these QoL benchmarks will vary between countries and regions due to their peculiar characteristics. It is on this ground that this study identifies critical issues for enhancing QoL policies in West African countries. These issues are related to five main QoL determining factors: healthcare outcome, environmental factors, food security, income level, and natural resource utilisation. Improving healthcare outcome, particularly the child mortality rate, should be non-

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negotiable for countries within the region. More efforts at achieving this are still required, especially in Nigeria, where it is highest. Thus, sustained improvement in primary health care provision in the region is imperative for QoL policy enhancement. Furthermore, opening up the economy with policies to encourage diversification of foreign direct investment inflows from resource-seeking to knowledge-seeking sectors will reduce the pressure on environmental factors for jobs. Such measures will also strengthen the effective implementation of environmental protection policies in West African countries.

Although countries within the West African region have begun to prioritise agriculture revolution, much effort is still required to improve seed and feed quality, output processing, and dietary consumption diversification. Income inequality should and urgently be addressed to enhance consumption of high-quality food, eliminate nutritional deficiency, and improve individual self-sufficiency and fulfilment. Furthermore, paying a living wage and increasing the tax burden on the rich than the poorest people will also help narrow the income gap in West African countries. West African leaders will also have to genuinely commit to using their natural wealth revenues for progressive spending policies on essentials such as human capital development and accumulation, hospital infrastructure, security, and social protection. With these primary issues being addressed, QoL policies in West Africa can then gain efficiency.

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Research involving human participants and or animals

This study article does not contain any study with human participants or animals performed by the author.

Data Availability Statement

The data that support the findings of the study are available from the corresponding author upon reasonable request.

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