

## **Mudarabah and Musharakah as a solution to financing SMEs: An ARDL approach**

### **Mudarabah et Musharakah comme solution au financement des PME : Une approche par ARDL**

**HAJARABI Hajar**

Ph.D. Researcher

ENCG Kenitra

Université Ibn Tofail - Maroc

Research Laboratory in Management Sciences of Organizations

**ACHIBANE Mustapha**

Professor Researcher

ENCG Kenitra

Université Ibn Tofail - Maroc

Research Laboratory in Management Sciences of Organizations

**Date de soumission** : 30/12/2023

**Date d'acceptation** : 07/02/2024

**Pour citer cet article** :

HAJARABI.H & ACHIBANE.M. (2024) «Mudarabah and Musharakah as a solution to financing SMEs: An ARDL approach », Revue Française d'Economie et de Gestion «Volume 5 : Numéro 2 » pp : 405 – 426.

Author(s) agree that this article remain permanently open access under the terms of the Creative Commons

Attribution License 4.0 International License



### **Abstract**

Small and Medium Enterprises (SMEs) face various challenges at all levels that impede their development. However, the issue of access to financing remains the major challenge to overcome. This research investigates the possibility of considering some Islamic finance products as a solution to the problems encountered by SMEs when accessing financing. Indeed, this article aims to study the impact of Mudarabah and Musharaka, the main products used in Islamic venture capital operations, on the performance of SMEs in Malaysia, given that this country is a pioneer in Islamic finance. To do so, an empirical analysis using ARDL modeling in the Eviews software was conducted to model the impact of the key mechanisms of Islamic venture capital, Mudarabah, and Musharaka, on the performance of SMEs in Malaysia.

**Keywords :** SME; Musharaka; Mudarabah; ARDL; Malaisia.

### **Résumé**

Les PME souffrent de plusieurs problèmes à tous les niveaux qui entravent leur développement. Mais le problème d'accès au financement reste le défi majeur à surmonter. Ce travail de recherche étudie la possibilité d'envisager quelques produits de la finance participative comme solution aux problèmes rencontrés par les PME lors de l'accès au financement. En effet, cet article tente d'étudier l'impact de la Mudarabah et la Musharaka, produits principaux utilisés dans les opérations du capital-risque islamique, sur le rendement de la PME en Malaisie, vu que ce pays est l'un des pionniers en finance islamique. Pour se faire, une analyse empirique par le biais de la modélisation ARDL dans le logiciel Eviews a été menée afin de modéliser l'impact des principaux mécanismes du capital-risque islamique, Mudarabah et Musharaka, sur le rendement de la PME en Malaisie.

**Mots clés :** PME ; Musharaka ; Mudarabah ; ARDL ; Malaisie.

## Introduction

The financing problem remains a major obstacle to the development of SMEs, diverting their efforts from innovation, investment, and wealth creation to finding ways of survival. Even if the constraint's origin is not financial, the solution often requires additional financing, highlighting the importance of analyzing this problem. Despite the array of current financing methods available to SMEs, the need persists, indicating a mismatch between available means and current financing needs.

Islamic finance can offer a solution to the financing challenges faced by SMEs. Indeed, this ethical form of finance is not solely driven by lucrative objectives; it also incorporates social considerations into its transactions. This can prove advantageous for SMEs, which, by their very nature, require more than just an investor – they need a partner to support them not only in funding but also in project management.

Malaysia is indeed among the countries where Islamic finance plays a significant role in the financial market. Therefore, this article's issue revolves around the possibility of considering certain practices in Islamic finance, particularly Islamic venture capital, as a solution to the SME financing problem. This product has been present in the Malaysian financial market since 2008, using Musharaka and Mudarabah as its main financing mechanisms.

These ambitions lead us to formulate our problem statement as follows: Can certain practices of Islamic finance, notably Musharaka and Mudarabah, be considered as a solution to SME financing problems?

To address this issue, this article will present an attempt to model the impact of these products, Musharaka and Mudarabah, on SME returns in Malaysia. The study period spans from 2009 to the first quarter of 2023, employing an ARDL approach.

Firstly, we will attempt to contextualize our empirical study through a literature review. Following that, we will present the methodology and descriptive analysis of the constructed sample. Finally, we will introduce the chosen model and discuss the obtained results.

### 1. Islamic finance for the SME Market : a literature review

Financing SME requires long credits because it is a question of financing investments which amortize over a long or medium term. Consequently, the development of SMEs can only be done with a policy based on long resources. Commercial banks have traditionally favored short-term financing and require important guarantees for medium to long term financing since their principal resources come from demand or term deposits.

The flagship product in conventional finance for SME financing is venture capital. Currently, the venture capital industry plays a modest role in the creation and financing of promising projects; however, businesses funded by venture capital exhibit a significantly lower failure rate compared to those financed by other conventional institutions (DURRANI & BOOCOOCK,2006). Islamic finance can provide a solution to the SME financing problem. Indeed, Islamic financial intermediation, based on the principle of profit and loss sharing, is considered the most suitable for SME financing. This intermediation includes investment accounts that are used to fund long and medium-term productive projects, namely Mudarabah and Musharaka. It is worth noting that contracts such as Musharaka and Mudarabah are most likely to reduce costs associated with information asymmetry (Ben Daoud, 2013). However, these contracts, whose implementation requires a significant amount of information, can lead to transaction costs.

Like conventional venture capital, Islamic venture capital has been present in the Malaysian financial market since 2008, utilizing Musharaka and Mudarabah as primary financing mechanisms. Malaysia possesses one of the most developed systems for Islamic venture capital (Ahmad, 2012). This product is very similar to its conventional counterpart, except that it aligns with Shariah principles, including the prohibition of financing illicit activities, etc. (Zaheer, 2019).

The approach of the SME market by Islamic financial institutions can be analyzed according to three criteria: investment, profitability, and the risk (Benzha, 2008). Regarding the first criterion, the investment, institutions that use participatory or Islamic contracts to finance SMEs, require from any entrepreneur or project leader to submit a feasibility study or a business plan that allows them to judge the importance of the project, its viability, risks to run and, possibly, guarantees to cover these risks. This assessment can only be made through a study that highlights all the financial, economic, commercial, technical, and organizational aspects. Most of the time the files submitted by these SMEs do not contain all the elements of appreciation because of their lack of qualifications to carry out these studies themselves or the lack of financial means to address specialized offices.

As the business plan submitted by SMEs rarely include all the items requested, Islamic banks have set up project and monitoring departments. The Islamic bank has a variety of models and financing tools (Moudarabah, Moucharakah, Murabahah, Ijarah etc.) for evaluating the business plan and financing the company. In a Mudarabah type of financing, the bank can support the total financing of the investment by acting as a partner. This type of financing is ideally suited to start-up and SMEs to obtain the necessary funds to implement the investment.

The promoter, presenting only his experience, will see his work and the profits generated by the exploitation shared as well: the financing of the project is the duty of the bank; the work is the responsibility of the client.

The second criterion is the profitability. Profitability represents the relationship between the incomes of a company and the sums which it mobilized to obtain them. It constitutes an element privileged to evaluate the performance of the companies. Moreover, it is the key element in Islamic finance. Indeed, for an Islamic bank, what matters the most is the profitability of the SME to finance insofar as the remuneration of the bank depends almost exclusively on this profitability. The sharing of profits between the SME and the bank reflects the fact that the profit is only the result of the combination of labor and capital.

Profitability is a key criterion in the decision to grant credit to SMEs. Unfortunately, for this type of business, the evaluation of profitability is difficult. It requires a detailed study of the project as mentioned before.

The last criterion is the risk. The bank is always more willing to finance the operations of already existing SMEs, having reached a level of growth, than those that are in the starting phase. In addition, the banks involvement is more pronounced for SMEs in transition to large enterprises than for other categories of nascent SMEs. This is mainly due to the level of risk incurred for each type of business.

It is therefore in a hostile and unfavorable financial environment in all respects that the problems of SME access to bank credit arise. As long as the situation of the banking system is not sound, granting loans to SMEs will be more difficult because the risk is even higher. The granting of credit to SMEs is generally associated with high risk, in particular because of the risk of insolvency and the fragile nature of the guarantees offered by SMEs. With Islamic banks, the problem of collateral is less acute than for conventional banks. The main guarantee available to these companies is the project itself, the experience of the entrepreneur and his ability to achieve the objectives initially defined by the financial institutions.

The problems related to bank financing for SMEs remain similar for traditional banking institutions and for the Islamic ones. However, it appears that the products offered by Islamic banks could be particularly adapted to the needs of this type of companies for several reasons. Islamic banks usually intervene as partners. Therefore, the contributions in funds can not constitute an obstacle for owner of the project. As a result, there will be no excessive debt that could eventually imperil the financial balance of the SME. In addition, Islamic financing is based on the principle of sharing losses and profits; it does not allow the imposition of fixed

interest. In order to meet the financing needs of targeted clients (SMEs), Islamic institutions offer a wide range of products that can be offered to entrepreneurs, such as: contracts *mudaraba*, *musharaka*, *ijara*, *murabaha*, *bayaa al muajjal*, *bayaa salam*.

The product used by Islamic finance to finance SME can be divided into participatory instruments and debt instruments. The participatory instruments such as the *Musharaka* and the *Mudarabah* are based on the morality of the client, the relationship of trust and the profitability of the project. This type of participative financing needs a perfect knowledge of the market and future associated customers by the entrepreneur. In fact, participatory instruments perfectly match the vocation of Islamic finance as a vector of development in the logic of sharing benefits and losses.

If in theory participatory instruments are favored by Islamic finance, in practice many Islamic banks tend to market debt or quasi-debt instruments, mainly *Murabahah* and *Ijarah*. This trend can be explained by the risk management and refinancing conditions that are generally implemented via short and medium-term deposit resources. However, in Islamic finance, debt and quasi-debt instruments effectively follow the principle of prohibition of interest and sharing of profits and losses.

The nature of some Islamic financial instrument, as said, may be of great interest to SMEs. Islamic finance can also be useful for novice entrepreneurs or those who want to exploit new markets through participation instruments such as *Mudarabah* and *Musharaka*. Thus, the promoters through a partnership based on a sharing of risks and profits will realize their projects. Also, the operations of *Ijara*, *Istisna* and *Salam* are very suitable instruments for financing the top of the balance sheet that SMEs can easily integrate into their investment plan.

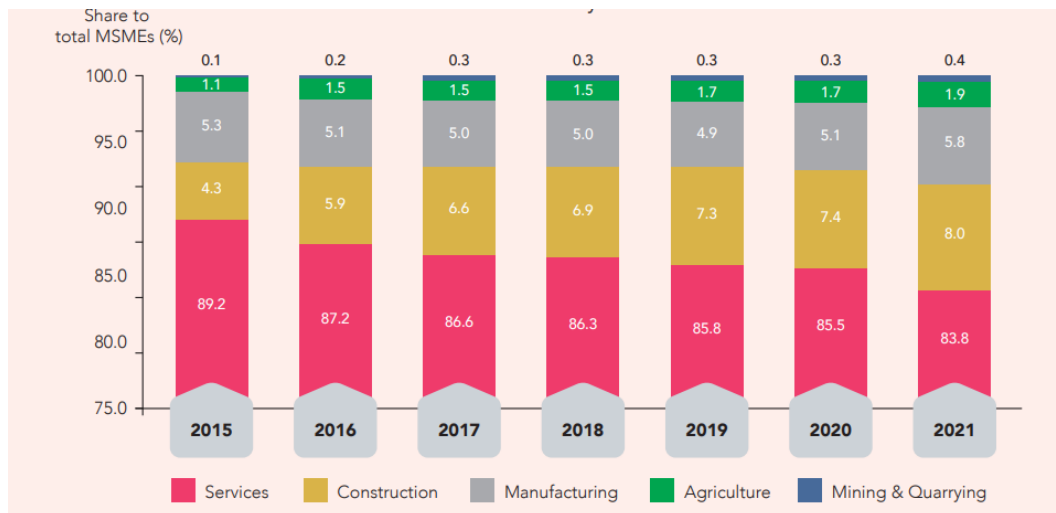
## **2. Islamic banking in Malaysia: strategic measures for SME**

SMEs are considered the engine of economic growth in every country. Undeniably, their importance is summed up in their capacity to create jobs, encourage innovation and promote the economic development of the country (BOOCOCK & SHARIFF 2005). In Malaysia, SMEs are the beating heart of the economy. Moreover, recent years have seen an exponential increase in the number of SMEs in Malaysia, i.e. 1,151,339 SMEs at the end of 2021 compared to 1,113,157 five years before. This increase also has positive repercussions on its added value in the country's economy, given that in 2021 SMEs contributed 38.2% to GDP compared to 35.9% in 2014, according to the department of Statistics Malaysia.

Likewise, SMEs have demonstrated that they have a significant impact on job creation in Malaysia, as of the total employment opportunities created, they contribute more than 48%.

According to the latest report from the national SME development council, the majority of this type of business is concentrated in the service sector at 83.8% in 2021.

**Figure N° 1: Distribution of SMEs by sector of activity in Malaysia**



**Source: Economic performance and outlook -SME towards sustainable recovery- 2021**

In Malaysia, Islamic finance is quite developed compared to other countries. The study carried out on the financing of SMEs in Malaysia by RAZALI and KHAIRUNISAH (2016) concluded that this type of companies prefers Islamic financing to conventional financing, more than 55% of the population responded that they finance themselves through the credit granted by Islamic institutions, because of its stability compared to conventional finance (because of the interest rate). Only 31% of the population chooses conventional finance and the rest adopts both. JAIZAH AND AL (2011). noted similar results in their descriptive analysis of the SME financing model in Malaysia, where they confirm that according to their survey SMEs prefer to finance themselves through Islamic rather than conventional debt products (28.2% compared to only 9.7% for conventional credits)

However, Ismail and Razak (2003) also examined the financing model of SMEs in Malaysia through Islamic financial institutions and concluded that the majority of businesses that resort to Islamic financing mainly move towards debt instruments rather than equity instruments such as Musharaka or Mudarabah.

In conventional finance, the most known and suitable instrument for financing SMEs is venture capital, especially for innovative SMEs. This product, initially coming from conventional finance, saw the light of day in Malaysia in 1984 with the creation of the first venture capital company "Malaysian Venture Bhd" but the birth of Islamic venture capital was not created until July 2008 with the "Musharaka venture Tech" fund, following the recommendation of Nagara

Bank Malaysia. Currently, there are more than 10 Islamic venture capital funds managed either by venture capital companies or by subsidiaries of financial institutions.

Two main mechanisms are applied in the context of financing via Islamic Venture Capital, namely: Musharaka and Mudarabah. Wakalah can also be used for this type of financing.

In order to see if financing by venture capital succeeded in having a positive return and allowed the SME to access financing, we will try in this empirical study to focus on the impact of financing by Musharaka and Mudarabah (flagship instruments of Islamic venture capital) on the performance of SMEs in Malaysia.

### **3. ARDL modelling approach and Data**

Modeling is a formalized presentation of a given phenomenon. In our case, the modeling will allow us to prove that financing through Musharaka and Mudarabah has an impact on the added value created by SMEs in Malaysia.

#### **3.1. Augmented Dickey-Fuller Test**

The “AutoRegressive Distributed Lag/ARDL” models are characterized by their dynamism. In fact, they take into account the temporal dynamics in the exposure of variables in a time series, namely: adjustment and anticipation lags. ARDL modeling is a combination of autoregressive models developed by Persan in the 90s, with the aim of helping to improve forecasting and thus policy effectiveness. There are three types of model:

- Autoregressive (AR): this is a model in which the dependent variable is lagged and included among the independent variables. The variable is regressed on itself (i.e., on its past values).
- The Distributed Lag model: based on  $X_t$  independent variables and past values.
- The ARDL (Autoregressive Staggered Lag) model: this combines the two previous models. The independent variables include not only the lagged dependent variable, but also the past values of the independent variables.

The choice of the ARDL model for our study is not a random choice. Indeed, this model has the particularity of analyzing the short-term relationships and long-term effects of several independent variable on the dependent variable, even if the variables in the time series are not integrated in the same order. In other words, the ARDL model makes it possible to introduce variables that do not have the same degree of integration.

To examine the effect of Musharaka and Mudarabah financing on the added value of SMEs, we will use the ARDL model as follows:

$$y_t = f(x_t; y_{t-p}, x_t - q)$$

With

$$y_t = \beta_0 + \beta_1 y_{t-1} + \dots + \beta_k y_{t-p} + \alpha_0 x_t + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + \dots + \alpha_q x_{t-q} + \varepsilon_t$$

Where  $y_t$  is a dependent variable,  $x_t$  is an independent variable and  $\varepsilon_t$  is the error term. In fact,  $y_t$  depends on the weighted sum of  $x_t$  whether it is the past or current values in addition to the error term. Therefore, the modeling consists of estimating the value of the constant  $\alpha$  and the coefficient  $\beta$ .

The ARDL model assumes that there is a cointegrating relationship between the variables of the study. This cointegration conditions the estimation of the ST and LT relationships of these variables and enables error correction.

Before presenting the econometric model, it is essential to determine the model's variables. In order to answer our research question, two types of variables were identified: the dependent and the independent variables.

The full time series data correspond to quarterly observations covering the period from January 2009 to March 2023. All data come from the quarterly statistical bulletins of the Central Bank of Malaysia.

- **Dependent variable:** The performance of SMEs: this is the variable which describes the sum of the added values of SMEs in the overall Gross Domestic Product (GDP) of a country. This variable in fact represents the contribution of this type of company to the national economy. It is calculated from the difference between intermediate costs and the total production of the SME. The choice of this variable as dependent variable will allow us to validate or not the issue of our work.
- **Independent variables:** These variables are incorporated into the econometric model to explain the dependent variable. The choice of these variables depends on the degree of their influence on the dependent variable.

This choice was made based on the analysis of the available data. Since the objective of this modeling work is to see if the introduction of Islamic venture capital as a means of financing SMEs in Malaysia has had an impact on their performance and if this impact is positive or negative, the choice of financing by Mudarabah and by Musharaka as explanatory variables seemed essential to us:

- Musharaka financing (FMK): cumulative amount of SME financing through Musharaka products in Malaysia
- Mudarabah financing (FMD): the cumulative amount of SME financing through Mudarabah products in Malaysia.
- Profit and loss sharing ratio (PPP): this ratio determines the share of each stakeholder in the company's net profits.
- Outstanding loans to SMEs (CRDT): it is the total amount of loans issued by several financial institutions to SMEs at a given time.

### 3.2. Descriptive statistics

The descriptive study allows us to analyze and describe the statistical data of a time series in order to represent the information contained in these data. To this end, it is essential to calculate the dispersion position and normality indicators. All the results obtained are shown in the table below:

**Table N°1 : Descriptive study of the variables.**

	Performance	PPP ratio	Musharaka Financing	Mudarabah Financing	Outstanding loans to SMEs
<b>Mean</b>	114367.4	0.053774	33663.63	154.5395	384339.3
<b>Median</b>	108145	0.052617	29990.91	142.8280	351824.7
<b>Maximum</b>	182641.1	0.068467	73529.12	405.6713	645416.9
<b>Minimum</b>	55064.80	0.039885	1276.091	43.70500	156701.5
<b>Std.Dev</b>	38164.92	0.007651	24297.28	104.8676	148718.3
<b>Skewness</b>	0.370834	-0.085418	0.114556	0.747773	0.496510
<b>Kurtosis</b>	1.897435	2.338525	1.505085	2.421464	2.082050
<b>Jarque-Berra</b>	4.193592	1.108493	5.432252	6.106981	4.343215
<b>Probability</b>	0.122849	0.574505	0.066130	0.047194	0.113994
<b>Sum</b>	6518943	3.065103	1918827	8808.750	21907341
<b>Sum sq. Dev.</b>	8.16	0.003279	3.31	615844.2	1.24

*Source : Authors*

The descriptive study shows that the "Mudarabah Financing" variable is normally distributed, as the Jarque-Berra probability value is greater than 5%, whereas the other variables are not normally distributed.

Furthermore, the value of the skewness coefficient demonstrates right-skewness of all the variables in our study, apart from the "profit and loss sharing ratio" variable, which is left-skewness. Essentially, this means that the variables have either a regularity or a uniform distribution. The Kurtosis coefficient is an indicator that summarizes the degree of flattening of the variables. If this coefficient is greater than 3, it means that the distributions are pointed (flatter than a normal distribution). In our case, no value is greater than 3. This means that the variables are less flattened than a normal distribution.

### 3.3. Stationary test

A time series is stationary if it has no trend, no seasonality and, more generally, no factors that change over time. Therefore, a series whose mean and variance tend to vary over time is a non-stationary time series. This can lead to unreliable regressions if left untreated. There are different tests to check the stationarity of a time series. The most well-known ones are: The Augmented Dickey-Fuller (ADF), Kwiatkowski-Phillips-Schmidt-Shin test and Phillips-Perron Unit Root Test. In this study, we have chosen to work with the test of Phillips-Perron. This choice is justified by the particularities of the test insofar as it is specially designed for statistical samples with a relatively small number of observations.

**Table N°2 : Phillips-Perron test**

Variable	Level of the test	Intercept	Trend & intercept	None	P-value	Stationarity
<b>REND</b>	Level	-3.39263	-11.25995	0.607477	0.000	Stationary
	First difference					
<b>FMK</b>	Level	1.282609	-2.582625	5.794273	0.0037	Stationary
	First difference	-3.905055	-4.010152	-1.287636		
<b>FMD</b>	Level	-2.074153	-1.320586	-1.931564	0.0001	Stationary
	First difference	-5.072364	-5.516754	-4.981451		
<b>PPP</b>	Level	-1.892925	-1.892925	-1.622132	0.0005	Stationary
	First difference	-3.655135	-3.655135	-3.620244		
<b>CRDT</b>	Level	-2.730367	-9.011922	1.042624	0.000	Stationary
	First difference					

*Source : Authors*

According to Table 2, the results of the Philips Perron unit root test provide information on the level of stationarity of the variables. The variables REND and CRDT have a unit root of order 0, unlike the variables FMD, FMK and PPP, which are stationary only at first difference.

#### 4. From ARDL to cointegration

To do this, the Pesaran cointegration test is divided into two stages. First, it is necessary to determine the optimal offset and estimate the most appropriate ARDL model. Then use the Fisher test to determine the cointegration between the series.

##### 4.1. Optimal model estimation

An optimal shift is determined from the model that offers the minimum value of the stated criteria (JK. Kuma, 2018). In order to select the optimal model, which provides statistically significant results with the fewest parameters, three information criteria can be used: Shwarz (SIC) , Akaike ( AIC) or Quinn (HQ), whose equations are as follows :

$$AIC(p) = \log |\hat{\Sigma}| + \frac{2}{T} n^2 p$$

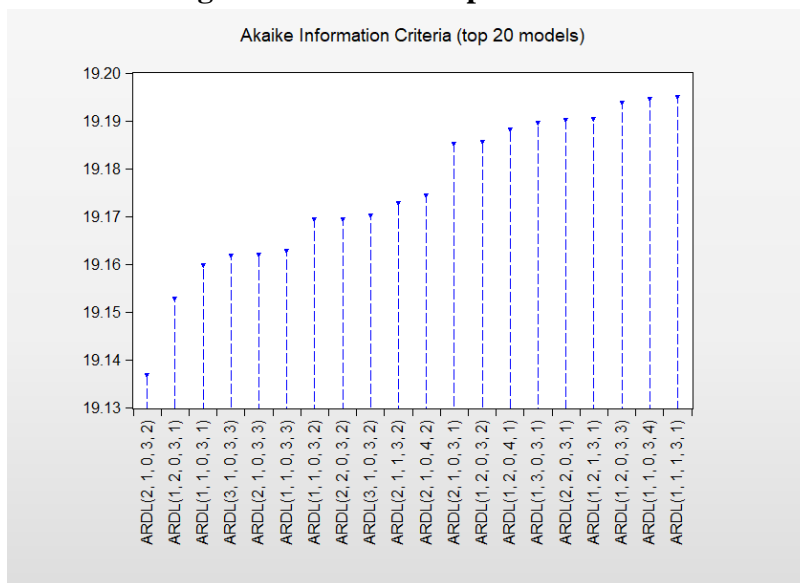
$$SIC(p) = \log |\hat{\Sigma}| + \frac{\log T}{T} n^2 p$$

$$HQ(p) = \log |\hat{\Sigma}| + \frac{2 \log T}{T} n^2 p$$

- Where T: number of observations
- n: number of regressions
- p : estimated model lag
- $\Sigma$  : variance-covariance matrix

The graph below shows the most optimal model elected according to AIC:

**Figure N°2 : AIC Graphical Values**



Source : Authors

The model chosen is (2,1,0,3,2), which, according to the AIC criterion, is the most optimal of the 19 other models generated by the software, as it has the smallest AIC test value. As such, it is the model that provides us with the most significant results in economic terms. The table below shows the results of the estimation of the chosen optimal ARDL (2,1,0,3,2) model:

**Table N°3 : Estimation of Model Coefficients**

Variable	Coefficient	Std.Error	t-Statistic	Prob.*
REND (-1)	0.339943	0.131667	2.581843	0.0135
REND (-2)	0.220802	0.128585	1.717164	0.0935
PPP	2045745	426460.6	4.797032	0.0000
PPP (-1)	-1760455	488066.3	-3.606999	0.0008
FMK	0.120812	0.078545	1.538128	0.1317
FMD	-14.64050	21.42022	-0.683489	0.4981
FMD (-1)	32.27364	34.95082	0.923402	0.3612
FMD (-2)	41.04529	33.59717	1.221689	0.2288
FMD (-3)	-77.05954	22.84418	-3.373268	0.0016
CRDT	0.288039	0.008953	32.17102	0.0000
CRDT (-1)	-0.131935	0.039161	-3.369078	0.0017
CRDT (-2)	-0.074912	0.038584	-1.941512	0.0591
C	2679.216	13785.99	0.194343	0.8469

*Source : Authors*

#### 4.2. Bounds cointegration test

The boundary cointegration test is the crucial step in ARDL modeling. It verifies whether or not there is cointegration between the variables. As a reminder, there are several approaches to cointegration testing, such as Engle and Granger or Johansen and Johansen . In our case, we have chosen to work with Persan, since the other two are not adapted to the specificities of our sample. Engle and Granger's approach is adapted to the bivariate case, where it tests cointegration between two variables integrated at the same order. Johansen's approach is more suited to the multivariate case and is essentially based on an error-correction vector autoregressive analysis.

The table below shows the value of the Fisher statistic and the theoretical values of the limits for thresholds of 1%, 5% and 10%.

Fisher's F value will be compared with the upper and lower bounds calculated by Eviews. There are three possible scenarios:

F > upper bound: there is cointegration between the variables

F < lower bound: there is no cointegration between variables

F is between the upper and lower bounds, meaning that we cannot identify whether cointegration exists.

**Table N°4 : Bound Test result**

F-Bounds Test		Null Hypothesis: No levels relationship		
Test statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-Statistic	4.438582	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.882	3.87
		1%	3.29	4.37

*Source : Authors*

Comparison of the Fisher statistics with the critical cut-off values allows us to reject the null hypothesis of no long-term relationship between the different variables. There is therefore a cointegrating relationship between the variables under study, since the value of F-statistic = 4.438582 is therefore greater than the upper limit, whatever the critical threshold. This cointegration relationship enables us to assess the long-term effects of the different variables on SME performance. This will be detailed after the diagnostic tests of the chosen *ARDL model*.

### 4.3. Long and short run relationship

According to the table below, the error correction model is indeed valid since the restoring force or the adjustment coefficient is statistically significant. Indeed, this coefficient is only considered significant if and only if it is:

- Negative
- In absolute value included in 0 and 1
- Different from 0 at the 5% level

For our case, the restoring force meets these three conditions since it is equal to -0.439255. As a result, we estimate that the model guarantees a correction mechanism and adjusts the imbalance of the variables to 43%. As a result, we also see that there is a cointegration relationship between the variables.

The short-term relationship in the ARDL model estimation represents the dynamics of the immediate corrections that occur between the variables and thus their impacts at CT on the variable studied.

This relationship can be determined through the following equation:

$$\Delta Y_t = \alpha + \beta_1 \Delta X_t + \beta_2 \Delta X_{t-1} + \dots + \beta_k \Delta X_{t-k} + \varepsilon_t$$

**Table N°5 : Short run dynamic**

ECM Regression				
Case: Restricted constant and no trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob
D (REND (-1))	0.220802	0.104366	-2.115659	0.0405
D (PPP)	2045745	351303.9	5.8232291	0.0000
D (FMD)	-14.64050	18.78853	-0.779225	0.4403
D (FMD (-1))	36.01425	20.94176	1.719734	0.0930
D (FMD (-2))	77.05954	20.54136	3.751433	0.0005
D (CRDT)	0.288039	0.006432	44.78164	0.0000
D (CRDT (-1))	0.074912	0.031948	2.344790	0.0240
CointEq (-1)	<b>-0.439255</b>	0.080359	-5.466190	0.0000

*Source : Authors*

From a short-term perspective, the variables that have the most impact on the performance of SMEs are outstanding loans as well as Mudarabah financing. However, the most significant variable which has a positive impact on the performance of SMEs in the short term and financing by Mudarabah, since it has a probability of less than 5%. Indeed, when the volume of financing through this participatory financial instrument increases, the performance of SMEs follows the same pace.

The table below gives us the estimate of the long-term coefficients. By analyzing it, we can conclude that:

- Musharaka financing has an impact on the performance of SMEs. As a result, the effects of Musharaka financing are positive in the long term. Thus, a 1% increase in the volume of financing by Musharaka improves the performance of SMEs by approximately 0.3%.
- Outstanding loans also have a positive elasticity but with an insignificant effect at LT.
- Financing by Mudarabah, unlike that by Musharaka, is significant but with a negative effect on LT.

**Table N° 6 : Long run dynamic**

Levels Equation				
Case : Restricted constant and no trend				
Variable	Coefficient	Std. Error	t-statistic	Prob
PPP	649486.0	385457.7	1.684974	0.0996
FMK	0.275039	0.062960	4.368488	0.0001
FMD	-41.84608	7.139430	-5.861264	0.0000
CRDT	0.184842	0.024623	7.507024	0.0000
C	6099.454	29494.84	0.206797	0.8372
EC = REND – (649486.0068*PPP + 0.2750*FMK – 41.8461 *FMD + 0.1848*CRDT + 6099.4537)				

*Source: Authors*

Therefore, the cointegration test allowed us to detect the nature of the impact of Mudarabah and Musharaka financing on improving the performance of SMEs. Thus, the analysis of the results allows us to conclude that in the long term, only Musharaka presents a positive sign of correlation, which shows that this financing instrument contributes to improving the performance of SMEs, but the outstanding credit is significant but does not really participate in the development of SMEs according to the results of the study.

### 5. Diagnostic tests for the estimated ARDL model

Several tests are available to diagnose the estimated model. We have chosen to validate our model using the following tests

#### 5.1. Error autocorrelation test

Autocorrelation is the fact that the observation errors in a time series are correlated and therefore lead to underestimating the standard error of the coefficients. Therefore, it is essential that the errors of a model, notably ours, are independent.

In order to prove the non-correlation of the errors, we chose to work with the Breush and Godfrey test because it allows us to statistically test the autocorrelation of any order.

**Table N°7 : Error Autocorrelation test**

Breusch- Godfrey Serial Correlation LM test			
F-statistic	3.321781	Prob. F (2,28)	0.0508
Obs*R-squared	10.16376	Prob. Chi-Square (2)	0.0062

*Source: Authors*

According to the table above, the value of the probability F of the test is greater than 5%, therefore, we note the absence of autocorrelation of the errors.

### 5.2. Heteroskedasticity test

Unlike homoscedasticity, heteroskedasticity is the fact that the observations in a sample do not have the same error variance. Indeed, it is one of the essential hypotheses for the validation of a model. Therefore, in order to check if the variances are homogeneous and the errors are distributed in an identical manner, we used the White test (Breusch, Pagan and Godfrey).

**Table N°8 : White test**

Heteroskedasticity Test: Breusch- Pagan- Godfrey			
F-statistic	0.546264	Prob. F (12,41)	0.8709
Obs*R-squared	7.443543	Prob. Chi-Square (12)	0.8270
Scaled explained SS	4.643018	Prob. Chi-Square (12)	0.9689

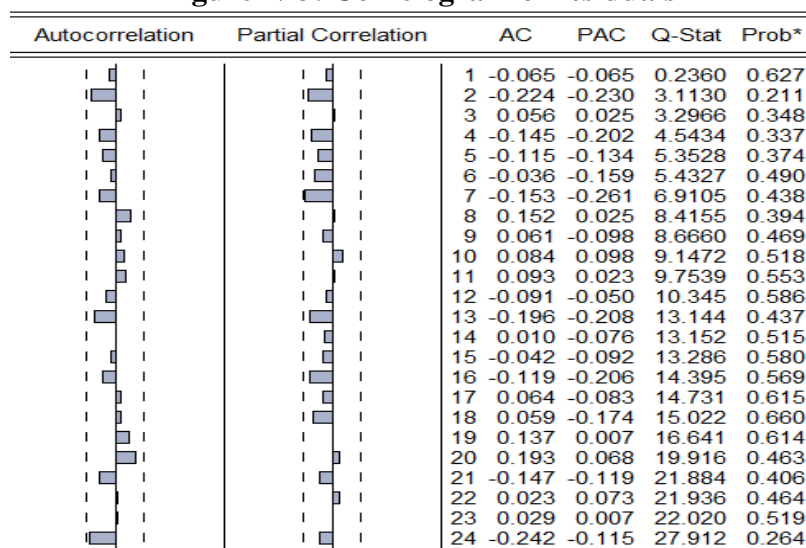
*Source: Authors*

The table above allows us to conclude that the variance of the residuals of our model is homogeneous and stable because the probability value of the F-statistic is greater than 5%. So the errors are not heteroskedastic but rather homoscedastic. We can see, then, that the variance of the residuals of our model is constant.

### 5.3. White noise test of residuals

The white noise test aims to examine the residuals existing between the values of the variables estimated by the model and those observed in order to determine if they behave like white noise.

**Figure N°3: Correlogram of residuals**



*Source : Authors on Eviews*

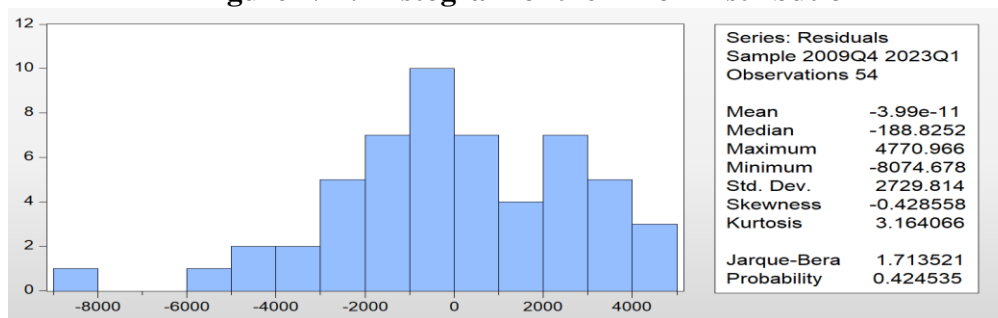
The figure above allows us to see that, whatever the delay observed, the probability of the test is greater than 5%. Therefore, for our study, we accept the null hypothesis of absence of autocorrelation and we reject that of the alternative hypothesis of autocorrelation of the

residuals between the observed values and those estimated at order K. As a result, all the terms of the correlogram are relegated between the two corridors. Which leads us to conclude that the residues do indeed behave like white noise.

#### 5.4. Normality test

The aim of normality tests is to examine whether the errors linked to a statistical series follow a normal law or not. This test is based on the notion of Kurtosis as well as that of Skewness asymmetry in order to consider the normality of a statistical series. Below is the result of the test done on Eviews:

**Figure N°4: Histogram of the Error Distribution**



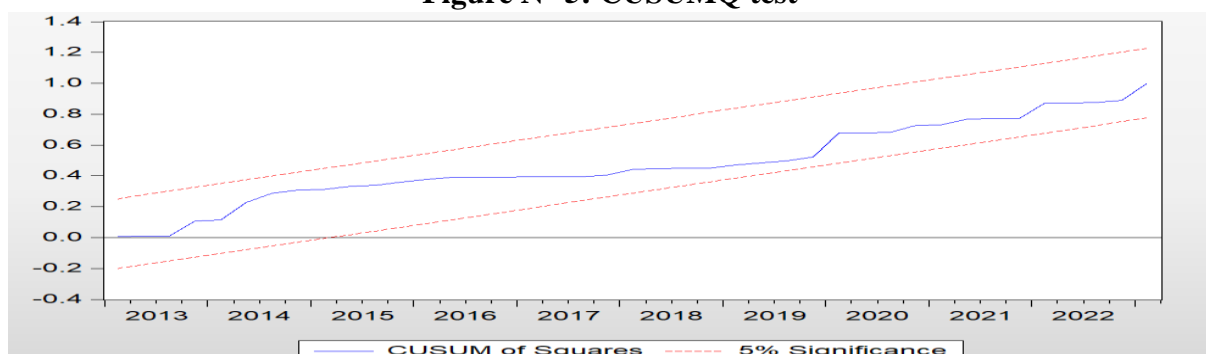
*Authors on Eviews*

According to the results of the normality test, the errors follow a normal distribution which confirms that they are Gaussian white noise given that the value of the Jacque-Bera probability is greater than 5%.

#### 5.5. Stability test

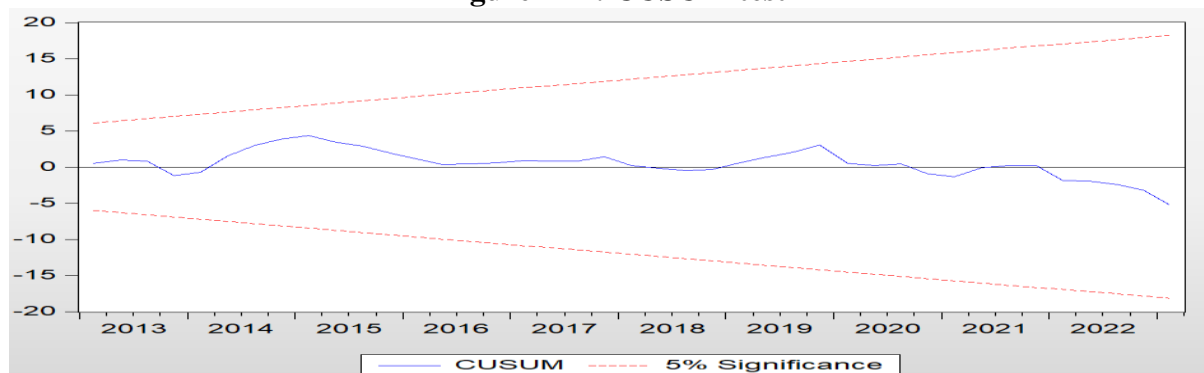
The stability tests of the model, namely CUSUM and CUSUMQ, are conducted with the aim of assessing the relationship between the dependent variable and the independent one.

**Figure N° 5: CUSUMQ test**



*Authors on Eviews*

**Figure n° 1: CUSUM test**



### *Authors on Eviews*

Based on the results above, our model is qualified as stable since the lines of the Cusum and Cusum of Squares tests are located between the two limits of the interval. As a result, the model coefficients are stable throughout the time series.

All things considered, the results provided by the various diagnostic tests allow us to conclude that our ARDL model (2,1,0,3,2) is statistically valid, which allowed us to draw relevant conclusions.

### **Conclusion**

Theoretically, the most suitable instruments of Islamic finance for SME financing are Musharaka and Mudarabah. In Malaysia, these two financing modes constitute the basic mechanisms of Islamic venture capital, as detailed before. Moreover, over 95% of investments through these instruments are made within the Islamic venture capital framework.

Our study aligns with this observation and attempts to model the impact of these two financing modes on the value-added of SMEs in the Malaysian GDP, which we have translated as SME returns. Indeed, the choice of variables was not arbitrary. Musharaka and Mudarabah financing forms the basis of Islamic venture capital in Malaysia. Since these two financing modes are based on the principle of profit and loss sharing, the choice of the average PPP rate variable is crucial. Furthermore, the last variable in our test, the total outstanding SME credits, strengthens the result to reflect SME financing demand.

After several tests, we have demonstrated that, in the short term, Musharaka and Mudarabah financing have no impact on SME returns, unlike the average PPP rate. In fact, there is no specific PPP rate issued by the central bank, as is the case with conventional interest rates. It is rather a negotiable rate for each project and contract, hence its short-term impact on SME returns. The more favorable the profit and loss-sharing rate for SMEs, the more demand there will be for this type of product, leading to increased economic financing and, consequently,

improved value-added. The bounds testing analysis has concluded that there is a cointegration relationship between the model variables. This cointegration is evident in the long term through the positive impact of Musharaka financing on SME returns. This aligns with real data since, in Malaysia, the most prevalent form of Islamic venture capital investment is Musharaka and Diminishing Musharaka. Therefore, we can conclude that Islamic venture capital through the Musharaka mechanism has had a positive impact on the returns of Malaysian SMEs during the study period, contributing to the increase in their value-added.

According to statistics provided by the central bank of Malaysia, since the creation of Islamic venture capital funds, the volume of Musharaka and Mudarabah financing has seen a remarkable increase, reflecting significant demand from SMEs for this type of product. Thus, it is an alternative in line with Sharia principles for investors and entrepreneurs concerned with adhering to Islamic religious principles. This analysis allows us to deduce that Islamic venture capital can be a response to SME financing needs and plays a growing role in the development of this type of business. Through modeling, we have concluded that, through the Musharaka mechanism, it has a considerable impact on the value-added of Malaysian SMEs.

In conclusion, Malaysia's experience with Islamic venture capital appears promising and could potentially, in the long term, resolve definitely the SME financing problem. Therefore, can we leverage this experience and model this product, adapting it to the specificities of the Moroccan market?

## **BIBLIOGRAPHIE**

- **Ahmad, F.M. (2012).** Shari'ah Compliant Private Equity and Islamic Venture Capital, Edinburgh University Press.
- **AYUB, M. (2007).** Understanding Islamic Finance, edition John Wiley & Sons, Vol. 462, 1-544.
- **BENYACOUB, B. & ES-SALMANI, M. (2021).** Modélisation ARDL, test de cointégration aux bornes pour la vérification de la soutenabilité de la dette publique au Maroc, Revue Internationale du Chercheur, Volume 2, Numéro 4, 1-24
- **BOOCOCK, G. & SHARIFF, M.N.M. (2005).** Measuring the effectiveness of credit guarantee schemes: evidence from Malaysia. International Small Business Journal, 23(4), 427-454.
- **BOURBONNAIS, R. (2018).** Econométrie, Eco sup, Dunod.

- **CHEKIR, M. (1992).** Introduction aux techniques islamiques de financement, Edition Institut Islamique de Recherches et de Formation, Banque Islamique de Développement, Acte de séminaire N°37.
- Department of Statistics Malaysia. Interactive Malaysia Statistical Business Register (i-MSBR); 2020. [www.dosm.gov.my](http://www.dosm.gov.my)
- Department of Statistics Malaysia. Performance of Small and Medium Enterprises (SMEs); 2021. [www.dosm.gov.my](http://www.dosm.gov.my)
- DURRANI, M. & BOOCOOCK, G. (2006). Venture capital, Islamic finance and SMES, Valuation, Structuring and Monitoring Practices in India, edition Palgrave.
- **HASSAN, R. (2021).** Islamic Venture Capital in Malaysia: Development, Constraints and Way Forward, International Journal of Excellence in Islamic Banking & Finance, vol 4, Issue 1, 1-14
- **HASSAN, R. (2013).** The evolution of Islamic venture capital in Malaysia : An Expository Study , Malaysian Court Practice Bulletin , Issue 3, 1-6
- **ISMAIL, A.G. & RAZAK, A.B. (2003).** Equity or debt as a security choice: Evidence from small-medium firms in Malaysia. International Journal of Management, 20(3), 408-417.
- **JONAS, K.K (2018).** Modélisation ARDL, Test de cointégration aux bornes et Approche de Toda-Yamamoto : éléments de théorie et pratiques sur logiciels » HAL, 1-55
- **MANAN, S. JAIZAH, O & SHAHADAN, A. (2011).** Descriptive analysis on the pattern of SME financing in Malaysia 3rd International Symposium & Exhibition in Sustainable Energy & Environment, 1-3 June 2011, Melaka, Malaysia, 139- 147.
- **RAZALI, H. & KHAIRUNISAH, I. (2016).** Islamic Financing in Mitigating Access to Financing Problems of SMEs, Malaysia: A Survey Analysis , intellectual Discourse, Special Issue, 387- 408.
- **MIKAIL, S. & ARIFIN, A. (2014).** Islamic Venture Capital in Malaysia: Development, Constraints and Way Forward International Journal of Excellence in Islamic Banking & Finance, Vol. 4, Issue 1, 1-13
- **SAAD, N.M. & RAZAK, D.A. (2013).** Towards an application of Musharakah Mutanaqisah principle in Islamic microfinance, International Journal of Business and Society, Vol. 14 No. 2, 221-234.

- **SME Corporation Malaysia (2015).** SME Annual Report 2014/15.
- **ZAHEER, A. & AL.** (2019). Islamic venture capital – issues in practice, ISRA International Journal of Islamic Finance, Emerald Publishing Limited, 2-13