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Islamic financial system efficiency effects on sustainable development: evidence from Arabic countries using an ARDL panel data analysis

اثار نجاعة النظام المالي الاسلامي على التنمية المستدامة: دراسة حالة الدول العربية باستخدام نموذج بانل بطريقة الانحدار الذاتي للفجوات الموزعة

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Abstract:

Sustainable development is affected by many social, environmental and economical factors. This study aims to assess the impact of islamic financial system efficiency on sustainable development. To asses this impact a panel data ARDL model is tested on a sample of 11 Arabic countries from 2011 to 2018, using Adjusted Net Savings as an endogenous variable. Results show that traditional factors have their theoretical effects, a strong positive impact of population and a negative effect of natural resources rent. While islamic financial system efficiency, measured through IFCI index, have a positive impact on sustainable development in long-run. Arabic countries would benefit from enhancing their islamic finance to reach sustainable development path.

Keywords: Sustainable development, Islamic finance, Arabic countries, ARDL, Panel.

JEL Classification Codes: Q01, G21, C33

ملخص:

تتأثر التنمية المستدامة بالعديد من العوامل الاجتماعية, البيئية والاقتصادية. تهدف هذه الدراسة إلى تقييم تأثير كفاءة النظام المالي الإسلامي على التنمية المستدامة. لقياس هذا التأثير، تم اختبار نموذج *ARDL* لبيانات البانل على عينة من 11 دولة عربية من السنة 2011 إلى 2018 ، باستخدام صافي المدخرات المعدلة *ANS* كمتغير تابع. تظهر النتائج أن العوامل التقليدية لها آثار موافقة للنظرية. تأثير إيجابي قوي لعدد السكان وتأثير سلبي لريع الموارد الطبيعية على التنمية المستدامة. في حين أن كفاءة النظام المالي الإسلامي ، التي تم قياسها من خلال مؤشر المالية الاسلامية للدول *IFCI* ، لها تأثير إيجابي على التنمية المستدامة على المدى الطويل. و منه ستستفيد الدول العربية من تعزيز تمويلها الإسلامي للوصول إلى مسار التنمية المستدامة.

كلمات مفتاحية: تنمية مستدامة, مالية اسلامية, دول عربية, الانحدار الذاتي للفجوات الموزعة, بانل

تصنيفات JEL : Q01, G21, C33

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INTRODUCTION:

Sustainable development holds an important place in economic debates in the last decades as shown by the role of this one in politics and strategies of international institutions through the sustainable development goals SDGs on the horizon of 2030. This one is affected by many factors; environmental, social, economical and financial, each one contributing to led countries to the path of sustainable development. Among those, the role of financial sector efficiency has been subject to many studies, especially since the last crises and demonstrate how a better system could allow to achieve SDGs through better allocation of resources. More recent research focus on Islamic banking role in financial system efficiency as it allows for more stable financial system, suggesting a role on achieving sustainable development.

Formal Islamic banks only started to appear in the mid-19s in Malaysia, 1940, as saving funds without interest, then in Pakistan, 1950, as banks that link loans from wealthy landowners to poor farmers without any return for the firsts, even if the experiment failed quickly. The first local Islamic bank was founded in Egypt in 1967, even if it had a large success through people, the experience didn't last long and stopped. This one was followed by the establishment of the Nasser Social Bank in 1971, that still stand until now, and aims to expand social solidarity (بوجلال، 1990) .

However, the real beginning of Islamic banking was in 1975, where two Islamic banks were established; Dubai Islamic Bank in the United Arab Emirates and the Islamic Development Bank in Saudi Arabia, and among the goals of the latter is to support economic development and social progress for the peoples of the member states and Islamic societies. In 1979, Sudan shifted from the traditional banking system to the Islamic banking system.

Then, Islamic banks spread through the world, reaching more than 300 Islamic financial institutions distributed in more than 30 countries. The countries of the Middle East are the most proficient countries in the field of Islamic banking industry, about 65 Islamic banks, followed by Malaysia, 17 banks, then Great Britain, 5 banks. The reason for this development of Islamic banking in these countries is the management of risks and sharing profits and losses that reduce failure (Bitar & Madies, 2013).

Thus, we aim in this paper to assess the effect of Islamic banking efficiency on sustainable development in Arabic countries in a period of time from 2011 to 2018. From literature review, we put a hypothesis of a positive effect of Islamic banking on sustainable development. To answer this problem, we follow a deductive method, starting from a literature review of factors affecting the sustainable development and focusing on financial and islamic banking effects we elaborate an econometric model to assess the impact of the later on sustainable development. A panel data model is applied, then, on 11 Arabic countries using and ARDL estimation method to study short- and long-term effects.

1- Literature review:

Sustainable development is defined (Bruntland, et al., 1987) as the development that meets the needs of the present without compromising the ability of future generations to fulfill their needs. Or, simply a development that ensure a social justice. To evaluate the degree of sustainable development in a country, many indicators have been elaborated. But the most

used one is the "Adjusted Net Savings" used by the World Bank and proposed by (Pearce & Atkinson, 1993). This indicator introduces environmental and social considerations to the accountancy of national accounts. It includes (Pardi & Nawi, 2016) the net investment on productive capital, investment on human capital and consumption of natural capital. Based on this, many studies tried to identify the elements that affect sustainable development as defined by the ANS.

Among common factors of sustainable development, the number of populations is considered to have an important positive impact (Herzog, 2012) by enhancing saving rate which affects positively the ANS. Secondly, natural resources are of great importance as a negative factor for sustainable development, economists (Asici, 2013) consider that exports of natural resources represent a consumption of the country's natural capital and diminishes the ability of sustainable development. Third, there are studies (Atkinson, Dubourg, Hamilton, Munasinghe, Pearce, & Young, 1997) insisting on the role of economic openness and trade, that could allow achieving economic development, creating employment opportunities and distributing income, which in return help attainting a greater social justice and puts the country on the path of sustainable development.

Finally, there are several studies (Qamruzzaman & Jianguo, 2018) (Arner, Buckley, Zetzsch, & Veidt, 2020) linking the solvency and efficiency of a country's financial system with sustainable development. These studies consider that a better financial system allows for an optimal distribution of financial resources towards more productive projects and a more effective link between agents that have a deficit and those with a surplus of resources, which allows achieving economic growth. It also, help reducing financial risks and the vulnerability of people, which allows them to invest in education and health and thus achieve sustainable development.

From this last factor, recent researches concentrate, also, on the role of islamic financial system. The study of (يحياوي, بوكميش, & بوحديد, 2016, pp. 579-580) indicates that islamic finance contribute to sustainable development through 3 dimensions; a social dimension by collecting and distributing charity to poor, offering interest-free credits to persons in need and respecting social aspect in general in their actions. An environmental dimension, through protecting financial resources from dilapidation by putting them on productive projects and avoiding the ones damaging the environment through agricultural loans el mozaraa and el mosakat. Finally, an economic dimension through sharing risks and loses, reducing vulnerability of people.

Thus, (Mohieldin, Ikbal, Rostom, & Fu, 2011, pp. 3-5) suggest that Islamic finance promote a financial inclusion by opening access to financial services to poor people and contribute reducing poverty. This is due to the fact that Islamic banking services are more accessible to all social classes in one hand and facilitate access for the people that voluntary avoid conventional banking services (Asli, Beck, & Honohan, 2008, p. 29) for cultural or religious reasons. Other studies (Ahmed, Mohieldin, Verbeek, & Aboulmagd, 2015) focus on the role of Islamic finance on stabilizing the financial system and enhancing its resilience through equity-based instruments that reduces insolvency and systemic risks.

2- METHOD:

To assess the effect of islamic banking efficiency on sustainable development indicator, we held a panel data analysis. The study was applied to a sample of 11 Arab countries; Algeria (DZA), Bahrain (BHR), Egypt (EGY), Jordan (JOR), Kuwait (KWT), Lebanon (LBN), Oman (OMN), Qatar (QAT), Saudi Arabia (SAU), Sudan (SDN) and Tunisia (TUN), that has different levels of development of the Islamic financial system, some countries, such as Morocco, have been rejected from the study as sufficient data on islamic financial system doesn't exist for all the period. The study covers a period of time from 2011 to 2018, resulting in 88 observations.

The model used is inspired by the study of (Pardi & Nawi, 2016, p. 69) on the factors affecting sustainable development, which we have expanded by introducing a new factor representing islamic finance efficiency. We shall see below the variables used, then the preliminary studies, followed by the results of the estimations.

2-1 Variables:

2-1-1 Dependent variable (Endogenous Variable):

We use in this study, as stated in the literature review, the "Adjusted Net Savings" ANS as an endogenous variable. This indicator is elaborated by World Bank and is calculated in the following way:

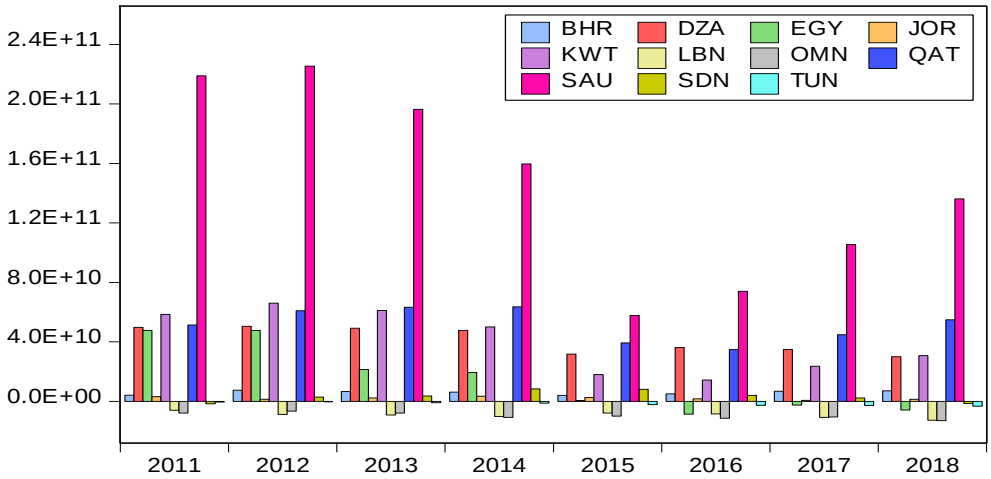
$$ANS = \frac{Net\ Investment\ in\ productive\ capital + investmet\ in\ human\ capital - consumption\ of\ natural\ capital}{Rough\ national\ income}$$

This equation can also be expressed as follow:

$$ANS = net\ national\ saving + investment\ in\ education - total\ natural\ resource\ rent - damage\ to\ nature$$

Total natural resource rent represents the shortage of natural materials for the country under consideration. While the damage to nature is expressed by exports of carbon dioxide CO2. The data for this indicator, used here, were extracted from the World Bank's SDG database.

Fig (1) : Evolution of ANS, Arabic countries (2011-2018)



Source: Elaborated by author, using Eviews 10

By analyzing individual performances in terms of sustainable development, from the precedent figure (Figure n°1), it is clear that Saudi Arabia has the highest positive values followed by Qatar and Algeria. In the other hand, Oman and Sudan have had negative values in all the considered period. As a general trend we can notice that all values are decreasing over time, this especially clear for Egypt where the ANS was good and positive in the first years, but become even negative the last three years. As for Algeria it has an average good performance in terms of sustainable development that is stable in time.

2-1-2 Independent Variables (Exogenous Variables):

Several studies have tried to suggest multiple methods to determine the factors affecting sustainable development and methods of measuring adjusted net savings, from which we have selected the independent variables, assessed in literature review especially the study of (Pardi & Nawi, 2016, p. 69).

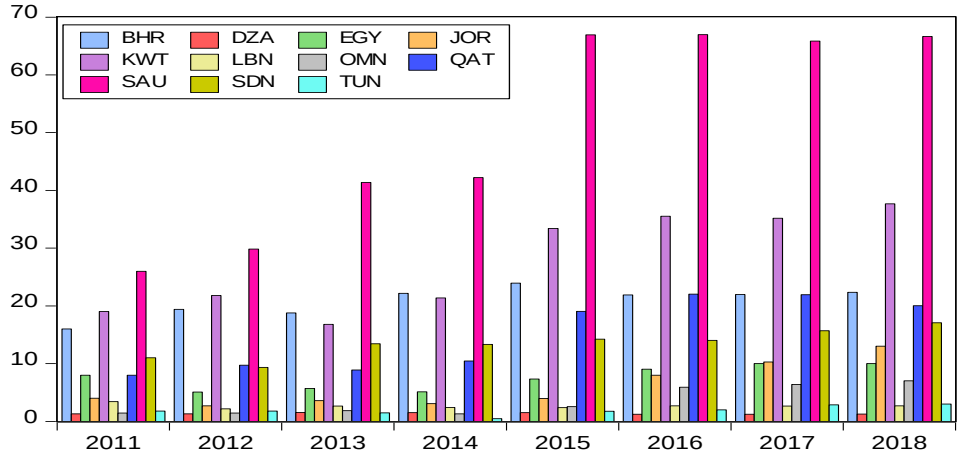
As suggested, we used three variables;

First, population as it can have several effects on both national saving and human capital, parts of the ANS, so we use the number of urban populations that is referred as POPU.

Secondly, to assess natural resource depletion we use natural resource exports or natural resource rent that is referred as NATRR in our study, the variable is expressed in percentage of GDP. These two variables are extracted from World Bank WDI database.

Finally, we introduce an indicator for islamic financial system efficiency expressed through the islamic finance country index IFCI indicator. This index is considered as an average, through an ACP method, of several indicators on the strength and stability of the islamic banking system and includes the number of islamic banks and islamic windows, the bodies supervising the implementation of Sharia, the assets of Islamic banks, the number of the Muslim population, islamic financial markets, islamic laws and finally islamic cultural factors. The index was developed by Edbiz Consulting in 2011, Data is obtained from Global Islamic Finance Report 2019 edition (Dar, Azmi, Sheikh, Asfand, & Sabree, 2019, pp. 58-59).

Fig (2) : Evolution of IFCI, Arabic countries (2011-2018)



Source: Elaborated by author, using Eviews 10

From the last figure (Figure n°2), we can notice that Saudi Arabia has the best performances in terms of islamic finance indicator followed by Kuwait, Sudan and Qatar. In the other hand Algeria, Lebanon and in a lesser extend Oman have poor performances in terms of islamic financial system efficiency.

Some other variables, such as money supply or external trade, suggested in other literature studies have been tested but results at different levels were non-significant for considered countries, suggesting for us to reject them.

2-2 Mathematical model:

Using the ANS equation and replacing each factor by the aforementioned indicators we obtain:

$$ANS_{ij} = f(POPU, NATRR, IFCI)$$

From the above and after entering the logarithm to linearize the equation, it can be rewritten as follow:

$$LANS_{ij} = \alpha_1 + \alpha_2 LPOPU + \alpha_3 LNATRR + \alpha_4 LIFCI + \varepsilon$$

For each variable we take the country i for the year j. The letter L refer to the logarithmic variables. The parameter α1 represents the constant, while the coefficients from α2 to α4 represent the elasticity of the ANS to each factor affecting sustainable development. According to literature review, coefficients α2 and α4 are supposed to be positive while α3 is expected to be negative.

2-3 Preliminary studies:

2-3-1 Descriptive statistics and evolution of interest variables:

The descriptive statistics of the used data is included in the next table:

Table (1): Descriptive statistics

	ANS	POPU	NATRR	IFCI
Mean	26,0 (10^9)	12,5 (10^6)	18,26	13,69
Minimum	-12,9 (10^9)	1,1 (10^6)	0,01	66,98
Maximum	226,0 (10^9)	42,0 (10^6)	61,95	0,48
Std. Dev.	48,2 (10^9)	12,2 (10^6)	17,26	15,58

Source: Elaborated by author, using Eviews 10

From descriptive statistics (Table n°1) we can notice for the ANS series that there is a large difference in term of sustainable development between countries as the standard deviation is very high while there is a huge gap between the minimum, negative, and the maximum, positive, confirming difference in terms of level of SD between Arab countries.

In the other hand, descriptive statistics for the Islamic financial system efficiency evaluated through the IFCI index, let us make the same remarks as the ANS, an important standard deviation suggesting a great variance in terms of level of development of the Islamic financial system between Arabic countries. It ranges from a very low level, near zero efficiency, to an excellent level of a 67 score.

Finally, a correlation test shows that all exogenous variables; POPU, NATRR and IFCI, are well correlated with the dependent variable, ANS.

2-3-2 Stationarity test:

To assess the stationarity of variables we use the common unit root test of Levin, Lin and Chu LLC test that is more performing when using panel data than ADF, especially when there is differences between cross-sections. Results are shown in the next table:

Table (2): LLC Unit Root test

	LANS	**LPOPU**	**LNATRR**	**LIFCI**
Level	-1,00	-1,12	-5,64*	-1,54
(P-value)	(0,13)	(0,13)	(0,00)	(0,06)
First difference	-1,71*	-13,59*	/	-4,71*
(P-value)	(0,04)	(0,00)		(0,00)
Order of Integration	I(1)	I(1)	I(0)	I(1)
* Significance at 5% level				

Source: Elaborated by author, using Eviews 10

The LLC unit root test shows that only one variable is stationary in levels, integrated of order 0, while three are stationary in first difference, integrated of order 1. The difference of the order of integration suggests the use of an Autoregressive Distributed Lag ARDL model. Also, p-value of Hausman test, tested by estimating both models, suggest the use of a Pooled Mean Group PMG estimator instead of a DFE one as suggested by (Kouadri & Cherif, 2020, pp. 44-45). This model is interesting as it allows short-term coefficients, intercept and speed of adjustment to be heterogenous between countries, as we have already noticed differences between countries of our sample in terms of ANS and IFCI.

3- Results:

The estimations resulted in an ARDL(1,1,1,1), lag structure was determined using Akaike Info Criterion (AIC), where this model was optimal, having the minimum value of AIC among tested models.

Table (3): Estimation results

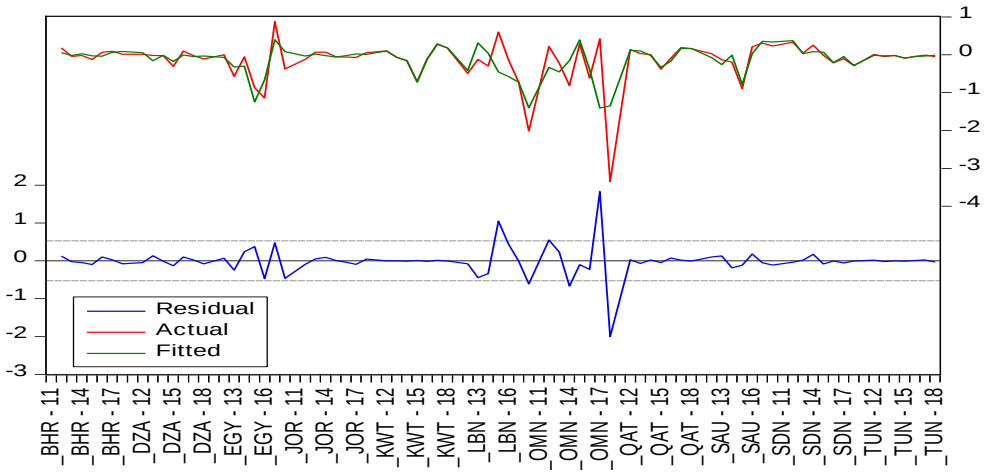
Long-run Elasticities			Short-run Elasticities		
Variable	Coefficient	P-Value	Variable	Coefficient	P-Value
LPOPU	**1,58***	**0,00**	D(LPOPU))	-4,27	0,62
LNATRR	**-0,49***	**0,00**	D(LNATRR)	0,27	0,44
LIFCI	**0,19***	**0,03**	D(LIFCI)	-0,10	0,59
C	**4,78****	**0,07**	**ECT(-1)**	**-0,91***	**0,01**

Source: Elaborated by author, using Eviews 10

Results show a negative and significant error correction RCT(-1) term that confirm the good fit of the model. Its value indicates the speed of adjustment toward long-term equilibrium. So, the adjustment of deviation towards long-term equilibrium is of 91% per year, in other terms equilibrium will be reached after a year and a month. The global model is well-fitted while

residuals (figure n°3) are not autocorrelated. Constant term C is also positive and significant, at a 10% level tough.

Fig (3) : Residuals



Source: Elaborated by author, using Eviews 10

As about the impact of each factor, we can notice that of the variables have a significant effect in short-term, this result is expected as sustainability effects are of long-run by nature.

Although, in the long-run, all variables have significant values and adequate with their theoretical sign. First, urban population have an important positive impact, coefficient 1,58, confirming the findings of (Herzog, 2012) the effect could pass through the augmentation of national savings. Secondly, natural resources rent have a negative impact on sustainable development, this was expected as it is a part of the accountant equation of the ANS and its effect is confirmed by many studies (Asici, 2013).

As of our variable of interest, the Islamic financial system efficiency, IFCI has a moderate positive impact on the ANS, attesting that a more developed Islamic financial system enhance sustainability of countries this could be reached through financial inclusion as suggested by (Mohieldin, Ikbal, Rostom, & Fu, 2011) (Ahmed, Mohieldin, Verbeek, & Aboulmagd, 2015) or through its social and environmental dimensions (يحياوي, بوكميش, & بوحديد, 2016).

Even if the financial system efficiency has a positive global long-term impact on sustainable development and non-significant impact on short-term, analyzing the short-term cross-sections shows differences between countries, while most of them are non-significant. The impact in short-term is positive in some countries with higher index of IFCI such as Sudan while it is negative in most countries with a lower development of Islamic financial system such as Algeria or Tunisia, this could result of implementation or adaptation effects in those countries and the absence of an Islamic capital market transactions.

Conclusion:

This study aimed to assess the impact of Islamic finance on sustainable development. Literature suggests many factors affecting the latter expressed through the adjusted net savings; productive capital, human capital, natural resources rent and national savings. In this scope a more efficient financial system could enhance sustainability of countries by raising their savings. Islamic financial system through its characteristics could affect sustainable

development, not only by improving a more inclusive financial system, but also by its social and environmental dimensions.

To assess this impact, an ARDL panel model has been applied to data from 11 Arabic countries, having different level of sustainable development and efficiency of Islamic financial system, through a period of time from 2011 to 2018.

Estimation results confirmed the effect, in long-run, of traditional sustainable development factors suggested by literature review, as the number of populations has a strong positive effect and natural resource rent has a negative one. This could advise countries to follow a more careful strategy for the exploitation of their natural resources especially the part destined to exports.

Finally, the model shows that Islamic financial system efficiency has a positive impact on sustainability confirming theoretical literature and study hypothesis. This impact is due to social, environmental and economical characteristics of this kind of finance that allows more financial inclusion and a better allocation of resources.

So, Arabic countries, especially those with a low sustainable development performance, would benefit more from enhancing their Islamic financial system. Unfortunately, some of them such as Algeria or Tunisia doesn't have a sufficient Islamic banking system. But Algeria has been doing some legal improvement towards generalization of the use of Islamic financial products in pure-Islamic banks and conventional banks that could put her on the path of sustainable development in mid- to long- run.

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