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Impact of Foreign Aid on Poverty in the Middle East and North African (MENA) Region. A Panel Data Analysis Approach

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Abstract: This study's two main objectives are as follows: Firstly, to investigate the impact of foreign aid on poverty reduction in the Middle East and North African (MENA) region. Secondly, to determine whether human capital development is a channel through which foreign aid influences poverty reduction in the MENA region. Put differently, to explore the impact of the complementarity between foreign aid and human capital development on poverty reduction in the MENA region. The study used econometric estimation approaches such as the dynamic generalised methods of moments (GMM), fixed effects, pooled ordinary least squares (OLS) and random effects with panel data spanning from 2007 to 2018. Though some minor contradictions are evident across the four econometric techniques used, the results can generally be summarized as follows: Foreign aid contributed towards poverty reduction in the MENA region. The study also noted that human capital development enhanced foreign aid's impact on poverty reduction in the MENA region. Authorities in the MENA region should therefore implement policies aimed at attracting more foreign aid at the same time strengthening their human capital development strategies and policies in order to alleviate poverty. Further research exploring the minimum threshold levels of foreign aid enough to significantly reduce poverty in the MENA region is encouraged.

Keywords: Foreign Aid; Human Capital Development; Poverty; Panel Data; MENA Region

JEL Classification: F35; J24; I32; C33; N57; N75

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1. Introduction

This section introduces the study and also highlights the gaps in the literature on the impact of foreign aid on poverty. This section describes of the importance of the study and justification for carrying out the study.

Background of the study: Consistent with Rewilak (2017), poverty reduction is one of the Millennium Development Goals (MDG) of the United Nations proffered as a foundation upon which lasting peace and social justice can be achieved. In particular, socio-economic development aspects such as income inequality, unemployment, malnutrition and school dropout rates should be reduced as part of poverty alleviation (Usuka. 2019). It is against this reason that most developed countries and the United Nations often give aid to developing and poor countries so that economic growth and poverty reduction can be realized (Clunies-Ross et al., 2009; Shleifer, 2009).

Lewis argued that foreign aid avails capital to enable developing and poor countries to engage into self-sustaining economic growth and poverty reduction projects and initiatives. Clunies-Ross et al (2009) also noted that developing and poor countries require a big external push in the form of foreign aid to make them free from capital deficiency trap that increases the vicious cycle of poverty. A different version argues that foreign aid creates laziness and overdependence on external help which is not good for enhancing productivity, economic growth and poverty eradication in the long run (Knack. 2001). Another school of thought propagated and nurtured by Mosley et al (1987) argues that there are factors that must be available before foreign aid can significantly influence poverty. Clearly, there is no consensus in the available theoretical rationales explaining the link from foreign aid and poverty.

Several empirical studies on the influence of foreign aid on poverty has been done in order to approve or disapprove the above theoretical rationales. What makes research on the impact of foreign aid on poverty fertile for further empirical tests is that the available research on the subject matter is characterized by the following: (1) results are quite conflicting and (2) most earlier studies on a similar subject matter suffers from methodological weaknesses such as use of outdated data for current policy making purposes, ignored endogeneity problem and the vicious cycle of poverty and wrongly assumed that the poverty function is linear.

Some empirical research found out that foreign significantly contributed towards poverty reduction. These include Mahembe and Odhiambo (2019), Mahembe (2019), Bourguignon and Platteau (2017), Amanda (2019), Seedee (2018), Page and Shimeles (2015) and Zafar et al (2017), among others. Others who found a non-significant positive impact of foreign aid on poverty reduction are Yontcheva and Masud (2005), Ijaiya and Ijaiya (2005), Almeida (2018), Calderon et al (2006), Ugwuanyi et al (2017), Shina (2018), Boye (2019) and Arshad et al (2014), only just

but mention a few. Empirical studies which found no clarity on the influence of foreign aid on poverty include Mahembe and Odhiambo (2017) and Magnon (2012). Okoronkwo et al (2016) on the other hand noted that certain factors need to be available before foreign aid can have a significant influence on poverty reduction. These contradictions in the findings means that the impact of foreign aid on poverty alleviation is far from being over. Its still an inconclusive investigation which requires more empirical tests. The study helps the policy making authorities in the MENA region in designing and implementing foreign aid policies which ensures that poverty reduction efforts can be complemented.

Contribution of the study: There are several ways in which this study contributed towards literature. Firstly, although there is an acknowledgement by Mosley et al (1987) and Okoronkwo et al (2016) that high levels of human capital development are necessary to enable foreign aid to enhance poverty reduction, no empirical study has been done to the author's best knowledge to approve or disapprove this assertion. This study is the first of its kind to investigate the influence of the complementarity between foreign aid and human capital development on poverty reduction. Secondly, majority of empirical studies on foreign aid-poverty nexus focused on other countries and or economic groupings but excluded the MENA region, which is one of the major recipients of foreign aid in the world. Thirdly, this study considered or captured the vicious cycle of poverty as explained by Azher (1995). Most prior studies on foreign aid and poverty ignored this possibility in their econometric estimations. This study used the dynamic GMM to capture the vicious cycle of poverty. Fourthly, this study correctly assumed that the relationship between foreign aid and poverty is non-linear. Fifthly, the use of the most recent data set ensures more informative and relevant decisions and policies can be formulated using the findings of this study.

Structure of the paper: The rest of the paper is structured as follows: Section 2 discusses the theoretical literature on the impact of foreign aid on poverty. Section 3 reviews the influence of foreign aid on poverty from an empirical point of view. Section 4 describes how not only does human capital development affects poverty but also influences foreign aid's ability to alleviate poverty. Section 5 is the research methodology. Data description, general and econometric model specification, control variables of the poverty function, panel unit and co-integration tests and main data analysis are the contents of this section. Section 6 concludes the paper. Section 7 list the references.

2. Foreign Aid and Poverty – Theoretical Literature

According to Lewis (1954), foreign aid avails the required capital to enable developing and poor countries to engage into self-sustaining economic growth. Poor and developing nations require a big external push to make them free from capital deficiency trap that increases the vicious cycle of poverty, argued Clunies-Ross et al (2009). In line with Shleifer (2009), foreign aid provides the financial and human capital development resources that oils and trigger investment, economic growth, wealth generation and ultimately poverty alleviation.

Balde (2011) argued that foreign aid enhances economic growth and poverty reduction through contributing towards domestic savings, investment and physical capital accumulation. According to Kargbo (2012), foreign aid boosts economic growth and poverty alleviation if most of it is channeled towards human capital development (technical assistance and capacity building). On the contrary, it was argued by Knack (2001) that foreign aid has a deleterious effect on economic growth and perpetuates poverty through its positive influence on corruption, laziness, renting seeking activities and institutional quality reduction effect.

3. Foreign Aid and Poverty – Empirical Literature

Table 1. Empirical Literature on the Influence of Mining on Economic Growth

Author	Country/ Countries of study	Period	Methodology	Results
Mahembe and Odhiambo (2019)	Exploratory study	Exploratory study	Exploratory study	Foreign aid was found to be a significant cog in influencing poverty reduction.
Yontcheva and Masud (2005)	58 countries	1990-2001	Unbalanced panel data analysis	The impact of foreign aid was found to be insignificant across all the countries studied.
Ijaiya and Ijaiya (2005)	Sub-Saharan Africa	1997 cross country data	Multi-regression analysis	The impact of foreign aid was found to be insignificant because of economic mismanagement, corruption, bad governance and economic instability.
Mahembe and Odhiambo (2017)	Exploratory study	Exploratory study	Exploratory study	There is no generally accepted economic theory on the impact of foreign aid on poverty reduction.

Almeida (2018)	102 countries	1995 - 2015	Panel data analysis	Foreign aid was found not effective in influencing poverty reduction across all the countries studies.
Calderon et al (2006)	176 countries	1971-2002	Cross-country regression and dynamic panel data analysis	Weak evidence was found relating to the impact of foreign aid on poverty reduction.
Okoronkwo et al (2016)	Nigeria	Literature review analysis	Literature review analysis	Absence of statistics on who must benefit from foreign aid and misappropriation of funds were some of the factors found to have negatively affected the impact of foreign aid on poverty reduction.
Ugwuanyi et al (2017)	Nigeria	1981-2014	Autoregressive Distributive Lag (ARDL)	In both short and long run, the impact of foreign aid on poverty reduction was found to be positive but non-significant.
Mahembe (2019)	Developing countries	1981-2013	ARDL, system generalized methods of moments (system GMM) and Vector Error Correction Model (VECM)	Foreign aid had a positive influence towards poverty reduction in developing countries using the system GMM approach. Foreign aid reduced poverty in the long run only using VECM approach.
Bourguignon and Platteau (2017)	World-wide	Literature review analysis	Literature review analysis	To a larger extent, foreign aid flow was found to be a vital cog in the poverty reduction process.
Magnon (2012)	Sub-Saharan Africa	1972-2008	Panel data analysis	The evidence that foreign aid reduce poverty was not found in Sub-Saharan African countries.

Shina (2018)	Sub-Saharan African countries	1990-2015	Panel data analysis	Foreign aid had an insignificant positive effect on poverty reduction especially when it is channelled through public investment and not consumption expenditure.
Amanda (2019)	Malawi	2000-2015	Time series data analysis	Foreign aid reduced poverty in Malawi
Boye (2019)	Ghana	2000-2018	ARDL	There is no significant positive impact of foreign aid on poverty.
Seedee (2018)	Liberia	1980-2018	Mapping content analysis	Foreign aid reduced poverty in Liberia.
Zafar et al (2017)	Pakistan	1986-2015	Time series data analysis	Foreign aid to a larger extent reduced poverty in Pakistan.
Page and Shimeles (2015)	Africa	2000-2011	Panel data analysis	Foreign aid had a significant positive impact on poverty reduction in African countries studied.
Arshad et al (2014)	Pakistan	1970-2010	Vector Autoregressive Approach	The impact of foreign aid on economic growth and poverty alleviation was insignificant in comparison to foreign debt's influence.

Source: Author Compilation

As already been enunciated earlier on in Section 1 under background of the study, empirical research on the role played by foreign aid on poverty alleviation efforts do not agree. They conflict, diverge and produced mixed results, hence paving way for more empirical tests.

4. Impact of Human Capital Development on Poverty Reduction

High level of human capital development (skills, education and health) enhances people's probability of securing not only just employment but well-paying job that can take someone out of poverty. The probability of people succeeding when they start their self-help employment is very high when they are skilled, educated and are in good health. (Chaudhry and Rehman. 2009; Gylfason and Zoega. 2003; Risikat. 2010). On the contrary, Afzal et al (2010) noted that public sector education form of enhancing human capital development does not reduce but exacerbates poverty and the vicious cycle of poverty. Mosley et al (1987) noted that one of the channels through which foreign aid influences poverty is through the direct traceability of

funds disbursed to the project(s) for which the aid funds were originally intended. In this study, this is proxied by the level of human capital development as it enhances chances that foreign aid eventually will find its way being used for its original intended purpose.

5. Research Methodology

Data description, general and econometric model specification, discussion of control variables, panel unit root tests, panel co-integration tests and main data analysis are the sub-sections covered under the research methodological framework.

Data description: The study explored the impact of foreign aid on poverty in the MENA region using panel ranging from 2007 to 2018. Poverty is the dependent variable whereas the explanatory variables includes foreign aid, human capital development, savings, personal remittances, infrastructural development, trade openness and foreign direct investment. United Nations Development Programme, African Development Bank, International Financial Statistics, World Development Indicators are the international databases where the secondary panel data was extracted. The MENA region countries included in this study are Algeria, Egypt, Libya, Morocco, Tunisia, Bahrain, Iran, Jordan, Israel, Oman, Lebanon and Qatar. These MENA region countries were included in this study because of data availability considerations.

General and econometric model specification

The following equation represents the general model specification.

$$POV = f(FAID, HCD, FDI, OPEN, INFR, REMIT, SAV) \quad (1)$$

Where POV, HCD, FDI, OPEN, INFR, REMIT, SAV stands for poverty, human capital development, foreign direct investment, trade openness, infrastructural development, personal remittances and savings respectively. The inclusion of these explanatory variables in this study mimics other empirical research on a similar subject matter such as Arshad et al (2014), Page and Shimeles (2015), Zafar et al (2017), Seedee (2018), Boye (2019), Amanda (2019) and Shina (2018). Domestic savings (% of GDP), personal remittances received (% of GDP), total number of telephone subscriptions (per 100 people), total trade (% of GDP), net foreign direct investment inflows (% of GDP) and human capital development index were respectively used as measures of savings, savings, infrastructural development, trade openness, foreign direct investment and human capital development. Net official development assistance received (% of gross national income) was used as a measure of foreign aid in this study. Mean life expectancy at birth, total (years), mortality

rate, infant (per 1 000 live births and mean household consumption expenditure (% of GDP) were used as proxies of poverty.

$$POV_{it} = \beta_0 + \beta_1 FAID_{it} + \beta_2 HCD_{it} + \beta_3 (FAID_{it} . HCD_{it}) + \beta_4 X_{it} + \varepsilon it \quad (2)$$

The following Table 2 interprets all the variables included in this study.

Table 2. Variables' Interpretation

POV_{it}	Poverty in country i at time t
$FAID_{it}$	Foreign aid in country i at time t
HCD_{it}	Human capital development in country i at time t
X_{it}	Explanatory variable in country i at time t. Explanatory variables includes foreign direct investment, trade openness, infrastructural development, remittances and savings.
β_1 to β_4	Co-efficient of the explanatory variables
i	Country
εit	Error term
β_0	Intercept term
t	Time

Source: Author Compilation

Alfaro and Johnson (2012) noted that foreign aid enhances not only domestic investment, but improves technology transfer, managerial skills as well as boosting employment rates and poverty reduction efforts**.** In other words, human capital development is a channel through which foreign aid influences poverty. It is against this backdrop that this study included a combination of foreign aid and human capital development as one of the possible explanatory variables of poverty. Equation 2 was estimated using econometric estimation techniques such as pooled OLS, random and fixed effects.

In line with Azher (1995), the vicious cycle of poverty (POV_{it-1}) exists. This transforms equation 2 to equation 3.

$$POV_{it} = \beta_0 + \beta_1 POV_{it-1} + \beta_2 FAID_{it} + \beta_3 HCD_{it} + \beta_4 (FAID_{it} . HCD_{it}) + \beta_5 X_{it} + \varepsilon it \quad (3)$$

This study carefully interpreted the sign of β_4 taking into consideration the measure of poverty used. If the co-efficient β_4 is negative and significant, the interpretation is twofold: Firstly, it means the complementarity of foreign aid and human capital development reduced poverty in the MENA region if the measures of poverty used is the mortality rate, infant (per 1 000 live births). Secondly, the combination of foreign aid and human capital development reduced poverty if the co-efficient β_4 is positive and significant on condition that mean household consumption expenditure (% of GDP) and mean life expectancy at birth, total (years) are used as poverty

proxies. The dynamic GMM is the econometric estimation methodology used to approximate equation 3.

Control variables: The impact of each control variable on the poverty function is discussed in this sub-section.

Table 3. A Discussion of How Control Variables Influence Poverty

Variable	Theory intuition	Source	Expected sign
FDI	Foreign direct investment inflows bring capital, skills, technology, management expertise, all of which enhances economic growth and employment and reduces poverty in the long run. (Solow. 1956; Romer. 1986). Consistent with Bornschier and Chase-Dunn (1985), over-dependence on foreign direct investment inflows has a negative effect on economic, development and employment in the economy.	Romer (1986); Bornschier and Chase-Dunn (1985); Solow (1956)	+/-
OPEN	It is easy for domestic firms to expand, employ more people and contribute to poverty reduction if they can source cheaper and the best quality raw materials wherever they can internationally (Pradhan and Mahesh. 2014). The latter also argued that trade openness expose firms to a lot of stiff competition to international companies which may drive them out of business and engage in massive retrenchments hence perpetuating poverty.	Pradhan and Mahesh (2014)	+/-
INFR	According to Jahan and McCleery (2005), poverty is reduced by infrastructural development as the latter enable people to access clean water, better roads, better education, clean energy and have better responses to natural disasters. In contrast, a study done by Pradhan and Mahesh (2014) observed that poverty was positively influenced by infrastructural development.	Jahan and McCleery (2005); Pradhan and Mahesh (2014)	+/-

REMIT	Anyanwu and Erhijakpor (2010) noted that remittances flow enables the recipients to start income generating projects and self-employ themselves, itself a sustainable way of getting out of poverty. The laziness that remittances creates among the recipients is the evidence that the country cannot rely on remittance inflow to eradicate poverty (Cattaneo. 2005).	Cattaneo (2005); Anyanwu and Erhijakpor (2010)	+/-
SAV	Steinert et al (2017) argued that the return on people's savings in the long run determine whether they will remain in poverty or not. The same study noted that savings anchors the foundation upon which poverty alleviation efforts must be based.	Steinert et al (2017)	+

Source: Author compilation

Panel unit root tests: In line with Aye and Edoja (2017), the data was converted into natural logarithm in order to do away with multi-collinearity, extreme values and spurious results in general. For methods (Levin et al. 2002; Im et al. 2003; PP Fisher Chi Square and Augmented Dicky Fuller (ADF) Fisher Chi Square tests) were used to test the stability of the variables used in this study.

Table 4. Panel Root Tests – Individual Intercept

	Level			
	LLC	IPS	ADF	PP
LPOV	1.47	4.41	8.87	7.98
LFAID	-2.39***	-1.22**	62.96**	88.03***
LHCD	-3.56***	-4.13***	-3.67***	-7.01***
LFDI	-2.12***	-1.99***	56.45**	98.80***
LOPEN	-4.76***	-4.13***	100.73**	123.93***
LINFR	-1.17	0.92	30.82	62.17**
LREMIT	-3.36***	-2.03***	66.11***	105.92***
LSAV	-1.16*	-1.87*	35.29**	51.45***
	First difference			
LPOV	-5.76**	-5.45**	90.72**	87.04*
LFAID	-10.66***	-9.24***	132.06***	396.04***
LHCD	-6.45***	-9.77***	-7.95***	-17.56***
LFDI	-11.98***	-12.05***	196.45***	421.59***
LOPEN	-10.77***	-11.84***	186.56***	643.56***
LINFR	-8.27***	-9.73***	156.64***	300.34***
LREMIT	-11.52***	-12.61***	173.84***	583.92***
LSAV	-7.39***	-7.48***	122.72***	371.96***

Note: LLC, IPS, ADF and PP stands for Levin, Lin and Chu; Im, Pesaran and Shin; ADF Fisher Chi Square and PP Fisher Chi Square tests respectively *, ** and *** denote 1%, 5% and 10% levels of significance, respectively.
Source: Author's compilation - E-Views figures

All variables were stable at first difference, hence integrated of order 1.

Panel co-integration tests:

Table 5. Results of Kao Co-Integration Tests

Series	ADF t-statistic
POV1 FAID HCD FDI OPEN INFR REMIT SAV	-3.0187***
POV2 FAID HCD FDI OPEN INFR REMIT SAV	-6.7742***
POV3 FAID HCD FDI OPEN INFR REMIT SAV	-5.0648***

Source: Author Compilation

Where POV1, POV2 and POV3 stands for model 1: Mean life expectancy at birth, total (years), mean household consumption expenditure (% of GDP) and mortality rate, infant (per 1 000 live births) respectively. Using Kao (1999) approach, the existence of a long run relationship among the variables used was upheld (see Table 5). Such results allowed main data analysis to be undertaken, consistent with Guisan (2014).

Main data analysis and results interpretation: Four econometric methods were used in this study. These include the dynamic GMM, fixed effects, random effects and pooled OLS.

Table 6. Dynamic Generalised Methods of Moments (GMM) Results

	Model 1	Model 2	Model 3
POV_{it-1}	-0.20063***	-0.0876***	0.0999*
FAID	0.0017*	0.2217*	-0.2165
HCD	0.3718***	0.0056***	-0.4528*
FAID.HCD	0.3482***	0.2321***	-0.1281***
FDI	-0.4452***	-0.0956***	0.1160**
OPEN	-0.5318*	-0.2221	-0.4431**
INFR	-0.0056	0.5342*	0.08974*
REMIT	0.4437*	0.0945*	0.1437*
SAV	0.0071***	0.2218	-0.1362
Adjusted R-squared	0.74	0.68	0.56
J-statistic	308	308	308
Prob(J-statistic)	0.00	0.00	0.00

***, ** and * denote 1%, 5% and 10% levels of significance, respectively
Source: Author's compilation from E-Views

Model 1: Mean life expectancy at birth, total (years)

Model 2: Mean household consumption expenditure (% of GDP)

Model 3: Mortality rate, infant (per 1 000 live births)

Under the dynamic GMM econometric methodology, the lag of poverty had a significant negative impact on mean life expectancy and mean household expenditure. The results also show that the lag of poverty had a significant positive effect on mortality rate. These results generally show that the lag of poverty increased poverty, in line with the vicious cycle of poverty (Azher.1995). Foreign aid was found to have had a significant positive effect on mean household expenditure and mean life expectancy and a non-significant negative impact on mortality rate. The results indicate that foreign aid reduced poverty in the MENA region, consistent with empirical studies done by Page and Shimeles (2015), Seedee (2018), Amanda (2019), Bourguignon and Platteau (2017*)* and Mahembe (2019).

A significant positive relationship running from human capital development towards mean life expectancy and mean household consumption expected was detected yet mortality rate was found to have been negatively and significantly influenced by human capital development. These results show that human capital development contributed towards poverty reduction in the MENA region, consistent with available literature (Gylfason and Zoega. 2003; Risikat. 2010; Chaudhry and Rehman. 2009), which argued that there is high probability among the people to begin self-help projects, entrepreneurial projects, generate wealth and reduce poverty when they are educated, educated and are in good health status.

The complementarity between foreign aid and human capital development was found to have reduced poverty under model 1 and 2 (significant positive effect on both mean household expenditure consumption and mean life expectancy) and also under model 3 (significant negative impact on mortality rates). These results are consistent with Mosley et al (1987) whose study argued that there is a high chance that foreign aid leads to economic growth and poverty reduction if there are high levels of human capital development to enable competent direct traceability of funds. This ensures that foreign aid money was used for its original intended purposes. They also resonate with Okoronkwo et al (2016)'s findings that absence of statistics on who must benefit from foreign aid and misappropriation of funds were some of the factors found to have negatively affected the impact of foreign aid on poverty reduction in Nigeria. Only competent and skilled personnel in the country can compile and keep such a database of statistics for decision making purposes.

Table 7. Fixed Effects Results

	Model 1	Model 2	Model 3
FAID	0.0754*	0.3677*	-0.3266
HCD	0.5438*	0.0687*	-0.2456*
FAID.HCD	0.3732***	0.4380**	-0.0327***
FDI	0.0537	0.2176***	-0.6732**
OPEN	0.2653*	0.6538	0.0341**
INFR	0.3487	-0.4376*	-0.3187*
REMIT	-0.1678*	-0.1769*	0.2658*
SAV	0.1474***	-0.6584**	-0.2674
Adjusted R-squared	0.61	0.59	0.54
F-statistic	98	98	98
Prob(J-statistic)	0.00	0.00	0.00

***, ** and * denote 1%, 5% and 10% levels of significance, respectively

Under the fixed effects approach, foreign aid enhanced mean life expectancy and mean household consumption expenditure but had a non-significant deleterious effect on mortality rate. The results are an indication that generally, foreign aid contributed towards poverty reduction in the MENA region, consistent with Clunies-Ross et al (2009) whose study argued that poor and developing nations require a big external push to make them free from capital deficiency trap that increases the vicious cycle of poverty.

Human capital development under the fixed effects also led to poverty reduction through its significant positive impact on both mean household expenditure consumption and mean life expectancy and its deleterious effect on mortality rates. The results resonate with Chaudhry and Rehman (2009) whose study observed that high level of human capital development (skills, education and health) enhances people's probability of securing not only just employment but well-paying job that can take someone out of poverty.

A significant negative relationship running from the complementarity between foreign aid and human capital development towards both mortality rates and a significant positive correlation running from a combination of foreign aid and human capital development towards mean life expectancy and mean household consumption expenditure was observed. The results are in line with Mosley et al (1987)'s argument that one of the factors that must be in place to enable foreign aid to significantly contribute towards economic growth, wealth creation and poverty alleviation is high levels of human capital development. This enables the availability of competent, educated and skilled people who understands the importance of channeling foreign aid towards its original intended purpose in as far as poverty reduction efforts are concerned.

Table 8. Random Effects Results

	Model 1	Model 2	Model 3
FAID	-0.1187*	-0.6743*	0.3111
HCD	0.2548*	0.1659*	-0.1176*
FAID.HCD	0.1168**	0.1554	-0.3299
FDI	-0.1659	-0.0428	-0.2247**
OPEN	-0.3794*	-0.4615	0.5643
INFR	-0.2659	0.0327*	-0.0043*
REMIT	0.2587*	-0.3428*	0.3217*
SAV	-0.6318	0.0634**	-0.0446**
Adjusted R-squared	0.57	0.63	0.55
F-statistic	102	102	102
Prob(J-statistic)	0.00	0.00	0.00

***, ** and * denote 1%, 5% and 10% levels of significance, respectively

According to the random effects, foreign aid had a significant negative impact on both mean life expectancy and mean household expenditure consumption. On the other hand, a non-significant positive influence of foreign aid on mortality rates was also observed. These results generally agree that foreign aid exercabated poverty, in line with Knack (2001) whose study argued that foreign aid perpetuates poverty through its positive influence on corruption, laziness, renting seeking activities and institutional quality reduction effect. Just like under the dynamic and fixed effects, random effects show that human capital development reduced poverty through its positive influence on mean life expectancy and mean household expenditure consumption and through its negative impact on mortality rates. Random effects also confirm that human capital development is a channel through which foreign aid enhances poverty reduction, consistent with Mosley et al (1987) and Okoronkwo et al (2016)'s arguments and findings.

Table 9. Pooled OLS Results

	Model 1	Model 2	Model 3
FAID	0.2176	0.4218	0.3419
HCD	0.2764*	0.0009	-0.1855
FAID.HCD	0.2318**	0.9658	-0.0438
FDI	-0.0660**	-0.2215**	-0.2659**
OPEN	-0.2286	0.1056	0.0532
INFR	0.0006**	0.0264*	-0.2187*
REMIT	0.1006	-0.5428*	0.4555*
SAV	0.1031	0.1986**	-0.1666**
Adjusted R-squared	**0.59**	0.61	0.52
F-statistic	**97**	97	97
Prob(J-statistic)	**0.00**	0.00	0.00

***, ** and * denote 1%, 5% and 10% levels of significance, respectively

Under the pooled OLS, foreign aid had a non-significant positive influence on both mean life expectancy and mean household expenditure consumption (reduced poverty) and on mortality rates (increased poverty levels). These are conflicting results which are however supported by literature as already enunciated in earlier sections. In line with Gylfason and Zoega (2003) and Risikat (2010), whose studies observed that human capital development reduced poverty, the pooled OLS noted that mortality rates were reduced by human capital development. It also shows that life expectancy and household consumption expenditure were increased by human capital development. The complementarity between foreign aid and human capital development significantly enhanced life expectancy but non-significantly increased household consumption expenditure yet also non-significantly reduced mortality rates in the MENA region. The poverty reduction effect of the complementarity between foreign aid and human capital development was confirmed and reaffirmed by Okoronkwo et al (2016) and Mosley et al (1987).

6. Conclusion

This study's two main objectives are as follows: Firstly, to investigate the impact of foreign aid on poverty reduction in the Middle East and North African (MENA) region. Secondly, to determine whether human capital development is a channel through which foreign aid influences poverty reduction in the MENA region. Put differently, to explore the impact of the complementarity between foreign aid and human capital development on poverty reduction in the MENA region. The study used econometric estimation approaches such as the dynamic generalised methods of moments (GMM), fixed effects, pooled ordinary least squares (OLS) and random effects with panel data spanning from 2007 to 2018. Though some minor contradictions are evident across the four econometric techniques used, the results can generally be summarized as follows: Foreign aid contributed towards poverty reduction in the MENA region. The study also noted that human capital development enhanced foreign aid's impact on poverty reduction in the MENA region. Authorities in the MENA region should therefore implement policies aimed at attracting more foreign aid at the same time strengthening their human capital development strategies and policies in order to alleviate poverty. Further research exploring the minimum threshold levels of foreign aid enough to significantly reduce poverty in the MENA region is encouraged.

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