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Foreign Direct Investment and child health outcomes in Africa

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GENERAL & APPLIED ECONOMICS | RESEARCH ARTICLE Foreign Direct Investment and child health outcomes in Africa

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Abstract: While several studies have examined the effect of Foreign Direct Investment (FDI) on economic development indicators, most of these studies focused on economic growth with very little attention paid to health outcomes. Moreover, among the studies that took account of health outcomes, none of them investigated the effect of FDI on child health outcomes across a sample of African countries. However, focusing on African countries is very important because sub-Saharan Africa (SSA) has the highest rate of child mortality in the world. This study, therefore, investigates the effect of FDI on child health outcomes in 39 African countries from 1980 to 2018. Neonatal and infant mortality rates are used to proxy child health outcomes. The baseline estimation technique employed is the Fixed Effects (FE) regression. However, to deal with potential endogeneity, we employ the

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PUBLIC INTEREST STATEMENT

In this paper, we examine whether FDI can be used to enhance the poor child health outcomes that have bedeviled Africa. This is necessary because, while various governments in Africa continue to rely on FDI as a major vehicle for attaining sustainable development, there is no empirical evidence with regard to the effect of FDI on child health outcomes across African countries. Our findings reveal that, FDI, if used effectively, can help in dealing with the poor child health outcomes that have plagued the African continent.

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system Generalised Method of Moments (GMM) regression as the robustness estimation technique. Our findings show that, FDI improves child health outcomes, especially through economic growth after controlling for endogeneity. Thus, in African governments' quest to reduce child mortality, a major useful strategy could be attracting more FDI inflows.

Subjects: Health & Development; Development Policy; Economics; Development Economics; Finance

Keywords: Foreign Direct Investment; child health; neonatal mortality; infant mortality; Africa

JEL Classification: I1; O55; F2; C33; C36

1. Introduction

As the world becomes increasingly globalised, Foreign Direct Investment (FDI) has become a major tool on which countries, especially those in the developing regions, seek to rely upon in order to ensure sustainable economic development. Hence, there have been some significant inflows of FDI into developing regions including Africa. For example, in 2009 (2010), FDI inflows into North Africa, West Africa, East Africa, Central Africa and Southern Africa were \$18.5 billion (\$16.9 billion), \$12.7 billion (\$11.3 billion), \$3.6 billion (\$3.7 billion), \$5.4 billion (\$8.0 billion) and \$20.0 billion (\$15.1 billion) respectively (United Nations Conference on Trade and Development [UNCTAD], 2011). Further, the inflows of FDI into Africa were \$41.8 billion and \$46 billion in 2017 and 2018 respectively (UNCTAD, 2018, 2019).

In spite of the above, the debate on the effects of FDI on development indicators is not conclusive. For instance, it has been found that FDI is detrimental to economic growth in developing countries (Herzer, 2010), hence, can deteriorate health outcomes. This is because, the negative effect of FDI on economic growth will lead to lower incomes, hence, decreasing peoples' ability to afford health inputs such as nutritious diet, improved sanitation and hygiene, quality medical care among others (see, Nagel et al., 2015). On another hand, FDI is being exalted for skills and technological advancements which would enhance economic growth or income (including a reduction in income inequality). This will therefore bolster peoples' ability to afford health inputs, hence improving health outcomes (Kokke & Stichele, 2008; Herzer & Nunnenkamp 2012; Nagel et al., 2015; Ucal et al., 2016; Kaulihowa & Adjasi, 2018).

From the above, it is evident that, FDI can affect not only economic growth but also other development indicators such as health outcomes. Notwithstanding, most of the empirical studies on the subject matter were devoted to the effect of FDI on economic growth (see, section 2), with very few paying attention to the health effects of FDI (see Herzer & Nunnenkamp, 2012; Nagel et al., 2015; Alam et al., 2016; Burns et al., 2017; Golkhandan, 2017; Immurana, 2020a; Salahuddin et al., 2020; Immurana, 2022).

Among the studies that focused on the health effects of FDI, only Immurana (2020a), Salahuddin et al. (2020) and Immurana (2022) were solely devoted to African countries. Moreover, given that sub-Saharan Africa (SSA) has the highest child mortality rate in the world, with every one child out of 13 children dying before reaching age five (World Health Organization [WHO], 2019), it is very important to examine the child health effects of FDI in Africa. Nonetheless, only Salahuddin et al. (2020), using South Africa as the country of interest, examined the effect of FDI on child health outcomes (infant mortality and under-five mortality). However, while a single country study can help in making country-specific policy recommendations, it is less useful in making recommendations for several countries. In addition, using data on several countries over

a period of time (panel data), provides more variability, efficiency, and statistical effects as well as minimises estimation bias relative to cross-sectional or time series data (Erica, 2021).

To this end, this study, investigates the effect of FDI on child health outcomes (neonatal mortality and infant mortality) in 39 African countries from 1980–2018. Thus, aside from contributing to the paucity of research as regards the effect of FDI on health outcomes, to the best of our knowledge, this study becomes the first to investigate the effect of FDI on child health outcomes across a sample of African countries. In addition, while approximately half of child (under-five) deaths occur in the first 28 days of life (neonatal period; WHO, 2019), as far as we are aware, no study has used neonatal mortality in examining the effect of FDI on health outcomes. This study, therefore, further contributes to literature by being the first to investigate the effect of FDI on neonatal mortality.

Our results indicate that, FDI reduces child mortality, especially through its effect on income. The implication is that, the attraction of more FDI inflows into Africa is augmenting other efforts geared towards reducing child mortality on the continent. Hence, measures aimed at attracting more FDI inflows should be enhanced in order to drastically reduce the higher burden of child mortality that has bedeviled the African continent.

The remainder of the paper proceeds as follows. Section two presents both theoretical and empirical review of literature. Section three outlines the data, model and estimation strategy used by the study, while in section four, results and discussion are presented. In the final section, we present the conclusion of the study.

2. Literature review

For the purpose of this study, we review two main theories of FDI; the classical or modern theory and the dependency theory.

The classical or modern theory basically states that, FDI helps recipient economies through the transfer of modern technology, skills and capital among others (Toone, 2013), which can enhance economic growth. On the other hand, proponents of the dependency theory argue that, Trade/FDI inflows tend to benefit developed economies at the detriment of developing countries. Thus, foreign firms who come to developing countries (such as those in Africa), aside from crowding out domestic investment, make and repatriate huge profits to their home countries that are already developed (Agbebi & Virtanen, 2017; Jensen, 2008). These, would therefore be detrimental to economic growth in developing economies.

Thus, from the above theories, whiles FDI inflow can enhance health outcomes by increasing individuals' ability to afford health inputs due to its positive economic growth effect (income enhancing effect), conversely, FDI inflow can be detrimental to health by reducing peoples' ability to afford health enhancing products as a result of its negative effect on economic growth.

Empirically, however, most of the existing studies have focused on the economic growth effect of FDI. For example, Herzer (2010) found FDI to influence economic growth negatively in 44 developing countries from 1970 to 2005, while employing the panel heterogeneous cointegration approach. Othman et al. (2014) in the context of Malaysia, for the period 1974 to 2009, found FDI to enhance economic growth after meeting certain macroeconomic conditions using the Hansen sample splitting and threshold estimation approach. Abbes et al. (2015), using a sample of 65 countries, for the period 1980–2010, revealed a unidirectional causal relationship from FDI to economic growth. Immurana et al. (2015), in the case of Ghana, examined the effect of FDI on the growth of the service sector for the period 1980 to 2013 using the Johansen co-integration technique. The study revealed that, FDI enhanced the growth of the service sector in the short-run period but not in the long-run period. In a related study, Sakyi et al. (2015), for the period 1970 to 2011, showed that the interaction of exports and FDI influenced economic growth positively in Ghana, using the Autoregressive Distributed Lag (ARDL) estimation approach. Iamsiraroj (2016), in a sample of 124 countries, assessed the economic growth-FDI nexus for the period 1971 to 2010 while using the simultaneous system of equations approach. The findings of the study showed a positive relationship between economic growth and FDI. Mahmoodi and Mahmoodi (2016), using a sample of eight countries each from Europe and Asia, investigated the relationship between economic growth, exports and FDI, employing the Vector Error Correction Model (VECM). Among others, the findings of the study showed a long-run causal relationship from export and FDI to economic growth. Abdouli and Hammami (2017), in a sample of 17 countries from the Middle East and North Africa, revealed that capital stock and FDI increased economic growth. Similarly, Sakyi and Egyir (2017) found the interaction between exports and FDI to enhance economic growth in a sample of 45 African countries for the period 1990 to 2014. Similar studies have been conducted by Nketsiah and Quaidoo (2017), Ho and Iyke (2018), and Awunyo-Vitor and Sackey (2018). Last but not the least, Sinha et al. (2019) found FDI to have a positive significant effect on economic growth among a sample of Asian countries.

With regard to studies that examined the effect of FDI on health outcomes, Herzer and Nunnenkamp (2012) revealed FDI to have a negative influence on life expectancy among 14 developed economies. Nagel et al. (2015) revealed that, FDI improved health (infant mortality rate and life expectancy) at low income-levels, but worsened health at high-income levels among 179 countries. In a related study in Pakistan, Alam et al. (2016) found that life expectancy was improved by FDI in the long-run. Similarly, Burns et al. (2017) in a sample of 85 low-and middleincome countries, found FDI to enhance population health by reducing adult mortality rate and increasing life expectancy. However, FDI was found to have insignificant effects on infant and under-five mortalities. Golkhandan (2017) found FDI to have reduced infant mortality among 25 developing countries. As regards studies solely devoted to Africa, Immurana (2020a) among a sample of 43 countries, investigated the effect of FDI on population health. The study used death rate and life expectancy to proxy population health. The findings revealed FDI to have negative and positive significant effects on death rate and life expectancy respectively. Also, Salahuddin et al. (2020) found that, FDI reduced infant and under-five mortality rates in South Africa. A similar study on Ghana by Immurana (2022) used death rate and life expectancy to represent population health. His findings showed FDI to have a negative significant effect on death rate but a positive significant effect on life expectancy.

The above review shows that, among the few studies that investigated the effect of FDI on health outcomes, none of them examined the effect of FDI on child health outcomes among several African countries. Also, while roughly half of child deaths consist of neonatal mortality, no study has used neonatal mortality in examining the effect of FDI on health outcomes. Therefore, since SSA has the highest child mortality rate in the world, this study, fills these voids in the literature by investigating the effect of FDI on child health outcomes in 39 African countries, using neonatal and infant mortalities as proxies for child health outcomes.

3. Data, model and estimation strategy

3.1. Data

In this study, we use data from the World Bank's World Development Indicators (World Bank, 2019, 2020) on 39 African countries (see Appendix) for the period 1980 to2018 to examine the effect of FDI on child health outcomes. The number of countries and the study period are dictated by data availability. Gaps in the data are filled using linear interpolation. The dependent variables are child health outcomes (CH) proxied by neonatal mortality rate and infant mortality rate. The main independent variable is net FDI inflows (FDI). Moreover, economic growth (Income), gross secondary school enrolment (Education (ED)) and immunisation (IM) are used as control variables.

Neonatal mortality and infant mortality rates are measured by the number of children who die before 28 days of life and age one per 1000 live births, respectively, within a particular year. FDI is

measured by net inflows of investment aimed at attaining at least 10% of voting stock in an entity based in an economy which is not the same as that of the investor, as a percentage of Gross Domestic Product (GDP). Income refers to the rate of growth of GDP measured in percentages (at market prices in constant local currency). Immunisation refers to the percentage of children who have received vaccination against diphtheria, pertussis and tetanus. Education is measured by the ratio of overall enrollment in secondary education (without regard to age) to the overall number of people in the age group recognised for secondary education (World Bank, 2019, 2020).

As regards the expected signs, as stated already in the preceding sections, the effect of FDI can be either positive or negative. Thus, while FDI inflows can increase income which would lead to more demand for child health inputs, hence reducing child mortality, conversely, FDI inflows can degenerate child mortality by decreasing income. On education, since it enhances the efficiency of health production (see, Grossman, 2000), we expect it to improve child health by decreasing infant and neonatal mortalities. Also, an increase in immunisation among children is expected to boost their immunity against diseases, which would lead to enhanced child health outcomes (see Immurana, 2021).

3.2. Model and estimation strategy

To estimate the effect of FDI on child health outcomes, we specify a simple model as follows:

$$\mathsf{CH}_{\mathsf{it}} = \mathsf{f}(\mathsf{FDI}_{\mathsf{it}}, \mathsf{IM}_{\mathsf{it}}, \mathsf{Income}_{\mathsf{it}}, \mathsf{ED}_{\mathsf{it}}, \varepsilon_{\mathsf{it}}) \tag{1}$$

where i, t, and ? represent country, year and the disturbance term respectively while the remaining notations are as already defined in section 3.1. However, in order to formally estimate the effect of FDI on child health outcomes, we re-specify equation 1 as seen below:

$$CH_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 IM_{it} + \beta_3 Income_{it} + \beta_4 ED_{it} + \varepsilon_{it}$$
(2)

where $\beta_{1-} \beta_4$ are the coefficients of the respective explanatory variables and β_0 is the intercept of the equation. However, as stated already in the preceding sections, a major channel via which FDI can affect child health outcomes is income. Hence, we modify equation 2 by introducing the interaction between FDI and income (FDI * Income) as an explanatory variable, with its associated coefficient being θ_5 .

$$CH_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 IM_{it} + \beta_3 Income_{it} + \beta_4 ED_{it} + \beta_5 (FDI * Income)_{it} + \varepsilon_{it}$$
(3)

Since we are using panel data (39 countries over the period; 1980–2018), we require a panel estimation technique in order to be able to examine the effect of FDI on child health outcomes. Therefore, in our baseline analysis, we employ the Fixed Effects (FE) panel regression to estimate equation 3. The FE regression is chosen ahead of the Random Effects (RE) regression based on the test of overidentifying restrictions (Sargan-Hansen statistic) which is available upon request. We use the test of overidentifying restrictions ahead of the Hausman (1978) test because, we employ cluster robust standard errors (to control for heteroscedasticity and serial correlation), which the Hausman (1978) test is unable to handle.

Notwithstanding, there is the possibility that some of the explanatory variables (especially FDI), are endogenous (simultaneity) which can lead to biased estimates (since the FE regression is unable to deal with endogeneity). Thus, while FDI can influence child health outcomes, child health outcomes can also influence FDI inflows, leading to endogeneity. In fact Immurana (2020b) found child mortality to deter FDI inflows into Ghana. Similarly, Alsan et al. (2006), Asiedu et al. (2015), and Ghosh and Renna (2015) found life expectancy, HIV/AIDS and communicable diseases to affect FDI inflows respectively. Moreover, it has been found that the previous level of child mortality affects the current level of child mortality, hence showing some level of persistence

(Immurana, 2021). Nonetheless, the introduction of a persistent term (lag of the dependent variable as a regressor) in an FE regression may lead to biased estimates (Baltagi, 2008; Sakyi & Egyir, 2017).

Given the above concerns, we employ the dynamic panel system Generalised Method of Moments (GMM) regression of Blundell and Bond (1998) and Arellano and Bover (1995) as a robustness check. We do so because the system GMM is naturally designed to include persistence . Also, the system GMM is capable of dealing with any form of endogeneity by employing first differenced and level equations as well as internal instruments; lags of the independent variables as instruments (see Roodman, 2009; Sakyi et al., 2018, Immurana, 2021; Immurana, Boachie & Iddrisu, 2021). The system GMM therefore helps in reducing the burden of finding external instruments for endogenous variables. Moreover, the system GMM makes it possible to verify the validity of the instruments as well as the propriety of the estimates using the Hansen *J* overidentification (Hansen) and Arellano-Bond serial correlation (AR (2)) tests. The insignificance of the p-values of these tests therefore confirms the validity of the instruments as well as the estimates (see Roodman, 2009; Sakyi et al., 2018, Immurana, 2021; Immurana, Iddrisu & Boachie, 2021; Immurana, Boachie & Iddrisu, 2021; Immurana, Iddrisu et al., 2021; Immurana, Boachie & Iddrisu, 2021; Immurana, Iddrisu et al., 2021; Immurana, Boachie et al., 2021, 2021).

It must be stressed that, in running the system GMM, given its assumption of more crosssections than time periods (Roodman, 2009), we take three year averages of our data. Moreover, as Uprety (2019) posited, such averaging aids in smoothening aberrations associated with high frequency data and also controls for changes over the business cycle.

4. Results and discussion

4.1. Descriptive statistics

In this sub-section, we present the summary statistics on the variables used by the study (see Table 1).

From Table 1, we can see that, while the mean neonatal mortality rate is 35.51 per 1000 live births, the mean infant mortality rate is 75.11 per 1000 live births. Also, the minimum and maximum FDI inflows as a percentage of GDP are -31.35 and 55.11, respectively.

4.2. Regression results and discussion

This sub-section presents the regression results and discussion of the effect of FDI on child health outcomes in 39 African countries as seen in Tables 2 and 3.

Table 1. Descri	Table 1. Descriptive statistics				
Variable	Obs	Mean	Std. Dev.	Min	Max
Neonatal mortality	1480	35.507	13.334	8.5	82.8
Infant mortality	1514	75.113	35.379	11.8	175.7
Education	1370	34.809	24.884	2.484	115.957
Immunisation	1429	66.841	25.978	1	99
Income	1481	0	5.151	-53.927	31.545
FDI	1500	0	5.164	-31.351	55.11
FDI*Income	1467	3.358	23.992	-324.759	257.458

The zero mean values of Income and FDI are due to mean centering in order to facilitate an intuitive explanation of their individual coefficients due to the introduction of the interaction term in equation 3 (see, Brambor et al., 2006; Sakyi & Egyir, 2017).

Table 2. FE regression es	timates of the effect of FDI on child	the effect of FDI on child health outcomes in Africa		
	(1)	(2)		
	Neonatal mortality	Infant mortality		
Education	-0.219***	-0.575***		
	(0.0530)	(0.126)		
Immunisation	-0.227***	-0.546***		
	(0.0253)	(0.0676)		
Income	-0.00723	-0.0948		
	(0.0324)	(0.0923)		
FDI	-0.173**	-0.640**		
	(0.0667)	(0.275)		
FDI*Income	-0.00108	0.00986		
	(0.00568)	(0.0214)		
Constant	58.43***	131.7***		
	(1.875)	(4.951)		
Observations	1230	1251		
Countries	39	39		
Overall R ²	0.719	0.710		
F-stat	38.07	32.69		
F-stat p-value	0.000	0.000		

Cluster robust standard errors in parentheses; * p < 0.1, ** p < 0.05, *** p < 0.01

In the baseline results (FE estimates, Table 2), with regard to the main variable of interest, FDI, we find it to have coefficients of -0.17 and -0.64 that are significant at the 5% level in the neonatal mortality and infant mortality models respectively. Thus, a unit increase in FDI is found to decrease neonatal mortality and infant mortality by 0.17 and 0.64 units respectively. As espoused already, this could be that, FDI enhances peoples' ability to afford child health inputs, hence reducing child mortality. This finding is in tandem with Golkhandan (2017) who found FDI to decrease infant mortality in 25 developing countries. Also, in South Africa, Salahuddin et al. (2020) found FDI to reduce infant and under-five mortality rates. In addition, since the countries used in this study are largely low-income economies, our finding concurs with Nagel et al. (2015) who found FDI to improve health at low-income levels among 179 countries. Conversely, Herzer and Nunnenkamp (2012) found FDI to be detrimental to health in 14 developed economies. The difference with regard to the effect of FDI on health in high-income and low-income economies can be attributed to the differences in the signs of the marginal effect of FDI on health in these economies (Nagel et al. (2015). Nonetheless, in testing whether income is a major channel via which FDI influences child health, we find that the interaction effect of FDI and income is insignificant.

Concerning the control variables, education is found to decrease neonatal mortality and infant mortality by 0.22 and 0.58 units respectively at the 1% level of significance. The outcome of education decreasing child mortality is not farfetched because, as indicated already (see Grossman, 2000), education makes individuals more efficient producers of health leading to better health outcomes. Also, education makes people/caregivers more willing to utilise health inputs (such as micronutrients and immunisation) for children (see, Immurana & Arabi, 2016a, 2016b; Immurana & Urmi, 2017, 2018a, 2018b). This outcome is in tandem with Novignon and Lawanson (2017) concerning the effect of education on neonatal mortality in a sample of African countries. Also, Nagel et al. (2015), Burns et al. (2017), and Novignon and Lawanson (2017) found similar outcomes with regard to the effect of education/schooling on infant mortality rate.

	(1)	(2)
	Neonatal mortality	Infant mortality
L.Neonatal mortality	0.896***	
	(0.0259)	
Education	-0.0448***	-0.170***
	(0.0156)	(0.0564)
Immunisation	-0.00205	0.0125
	(0.00796)	(0.0226)
Income	-0.0502*	-0.319***
	(0.0276)	(0.0578)
DI	-0.0467*	-0.123**
	(0.0233)	(0.0543)
DI*Income	-0.0364***	-0.0465**
	(0.0123)	(0.0223)
.Infant mortality		0.899***
		(0.0356)
Constant	3.727**	8.157
	(1.521)	(5.635)
Observations	409	416
Countries	39	39
instruments	29	31
AR(2)	-1.464	-1.208
R(2) p-value	0.143	0.227
lansen	22.53	19.33
lansen p-value	0.259	0.564
F-stat	3665.6	2946.2
F-stat p-value	0.000	0.000

Standard errors in parentheses;* p < 0.1, ** p < 0.05, *** p < 0.01; Year dummies are not reported due to brevity; L=first lag of the associated variable.

Also, a rise in the percentage of children who have received immunisation is found to reduce neonatal mortality and infant mortality by 0.23 and 0.55 units, respectively at the 1% level of significance. This result is expected since immunisation enhances immunity against diseases. Our result is in line with Uprety (2019), Arthur and Oaikhenan (2017), Immurana (2020a,2021) and Immurana, Iddrisu et al. (2021) who found immunisation to enhance health outcomes.

Given the likelihood of endogeneity especially between child health outcomes and FDI, we employ the system GMM as a robustness check (Table 3). We find the first lags of neonatal mortality and infant mortality to have positive significant effects (at the 1% level) on current levels of neonatal mortality and infant mortality, respectively. This therefore emphasises the persistence of child mortality overtime. Similar outcome was reported by Immurana (2021) among a sample of African countries.

Concerning FDI, we find that it reduces neonatal mortality and infant mortality by 0.05 and 0.12 units at the 10% and 5% levels of significance respectively. Although the magnitude of the effects are less than that of the baseline results, the implications of the findings are not qualitatively different. Our finding is not in line with those of Burns et al. (2017) who found FDI inflows to have

an insignificant effect on infant mortality rate. The conflicting finding with Burns et al. (2017) could be due to the differences in the countries used. Thus, while this study is devoted to only African countries, that of Burns et al. (2017) wasn't.

Unlike the baseline results, after controlling for endogeneity, we find that income, is a major channel via which FDI influences child health outcomes. Specifically, the interaction effect of FDI and income is found to reduce neonatal mortality and infant mortality by 0.04 and 0.05 units at the 1% and 5% levels of significance respectively. As indicated in the preceding sections, the implication is that, FDI increases economic growth, resulting in higher incomes. This increase in incomes, enhances peoples' ability to afford child health services/inputs. Also, rising FDI led economic growth could result in higher spending in the health sector leading to the availability of more health infrastructure which would make healthcare easily accessible (Immurana, 2020a) to people and children in particular, hence, decreasing child mortality. It is therefore not surprising that, from our robustness results, a unit increase in income (economic growth) decreases neonatal mortality and infant mortality by 0.05 and 0.32 units at the 10% and 1% levels of significance respectively. The outcome on the health enhancing effect of income is in tandem with those of Nagel et al. (2015), Burns et al. (2017), Novignon and Lawanson (2017), and Boachie et al. (2020). In addition, the effect of education on child mortality is not qualitatively different from that of the baseline results.

5. Conclusion

In this study, we investigate the effect of FDI on child health outcomes in 39 selected African countries from 1980 to 2018. Neonatal mortality and infant mortality rates are used to proxy child health outcomes, and the FE regression is used as the baseline estimation technique while the system GMM regression is used as a robustness check because of its ability to deal with endogeneity. The control variables used by the study are economic growth (income), education and immunisation. The study is necessitated by the fact that, while a lot of studies have been devoted to the effect of FDI on other socio-economic indicators, especially, economic growth, very little attention has been paid to health outcomes. Moreover, while SSA has the highest child mortality rate in the world, to the best of our knowledge, no study has investigated the effect of FDI on child health outcomes across a sample of African countries. In addition, among the studies devoted to the effect of FDI on health, the current study is the first to use neonatal mortality as a measure of child health outcome.

The study finds that, FDI enhances child health especially through income, after controlling for endogeneity. Our findings therefore confirm the health enhancing effect of FDI. Hence, African governments should deepen their drives towards attracting and retaining more FDI inflows. Such drives should include easing administrative procedures for foreign investors, signing more multilateral/bilateral agreements, making entry into African economies easier, providing fiscal incentives (such as tax waivers), discarding double taxation schemes as well as encouraging foreign investors to re-invest accrued profits (UNCTAD , 1999, 2019; United States Department of State, n.d; Immurana, 2020a). However, in doing so, attention should be paid towards ensuring that foreign firms hire a significant number of Africans (Immurana, 2020a), in order to increase income, which is a major channel via which FDI influences child health.

In spite of the above, the present study is not without limitation. Thus, while we test income or economic growth as a major channel via which FDI can affect health, future research can focus on other important channels such as corporate social responsibility and safer working environments provided data will be available.

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No potential conflict of interest was reported by the authors.

Availability of data and material

The data employed by the study are freely available from the website of the World Bank at: https://databank.world bank.org/source/world-development-indicators and https://databank.worldbank.org/source/worlddevelopment-indicators#

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Appendix

Algeria, Botswana, Benin, Burundi, Burkina Faso, Cameroon, Central African Republic, Cape Verde, Chad, Republic of Congo, Democratic Republic of Congo, Cote d'Ivoire, Gabon, Egypt, The Gambia, Guinea, Ghana, Guinea-Bissau, Lesotho, Kenya, Madagascar, Mali, Malawi, Mauritius, Mauritania, Mozambique, Morocco, Nigeria, Niger, Rwanda, Seychelles, Senegal, Sierra Leone, South Africa, Somalia, Sudan, Togo, Tunisia, and Uganda.



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