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Human Development and Net Migration: the Ghanaian Experience

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Abstract

This study examines human development as a key economic driver of net migration in Ghana. The study uses annual time series data spanning the period of 1980–2020. An instrumental variable econometric approach is used for the analysis based on its strength in addressing identification challenges such as serial correlation and endogeneity issues commonly associated with time series data. Other econometric techniques are also used for robustness purposes. The study shows evidence of a negative and statistically significant relationship between human development and net migration in Ghana. This finding implies that improving human development negatively drives net migration in favour of emigration. The study recommends that efforts towards improving education, health and income should be strengthened to reduce emigration especially skilled and illegal migrants. This study concludes that human development is a key socio-economic driver of net migration in Ghana.

Keywords HDI · Migration · Ghana · Instrumental Variable · Time series

Introduction

According to the United Nations Department of Economic and Social Affairs (UN DESA, 2019a) and the International Organization for Migration (IOM, 2020), Ghana was listed among the top twenty African migrant countries in 2019, with

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more emigrants than immigrants. Net migration rate is defined as 'the number of immigrants minus the number of emigrants over a period, divided by the person-years lived by the population of the receiving country over that period' (UN DESA, 2019b, p 1). This act of people moving from one destination to another has been with mankind since the foundation of human existence. In a similar perspective, Castles and Miller (1993) express that population movements have been with man since time immemorial. Lee (1966) has described the underlying forces as the 'push and pull' theory of migration. Empirically, Castelli (2018) has advanced that individuals always move to search for a better living condition elsewhere or evade precarious circumstances (e.g. human right abuses, political unrest) in their homeland. Richmond (1994) attributes labour migration from developing to developed countries to globalization, unequal distribution of wealth, and technological and economic development.

Several developing countries have experienced challenges with migration. What has been observed as a major problem, which is yet to be holistically addressed, is the high rate at which the labour force or individuals within the productive age bracket migrate to the developed world. For instance, in 2009, 40% of Ghana's productive age bracket who have completed tertiary education went to an OECD country (see Shimeles, 2010). Also, according to Hagopian et al. (2004), Ghanaian doctors are considered a key part of African doctors practicing in the USA. Asiedu (2010) argued that Ghanaian doctors working locally are less than those working overseas. In addition, most Ghanaians who migrate to Europe and North America are highly skilled workforce. For example, about 76.2% of Ghanaian migrants are gainfully employed in their destination countries (Ghana Statistical Service, 2010).

Generally, unskilled emigrants remain economically and socially vulnerable during most years of their journey and stay. Yet, the ambition of most educated or uneducated youth to migrate still lingers on. A very high percentage of Ghanaians desire to migrate to other countries with perceived better opportunities (Afrobarometer, 2017). It is not surprising that about 1.7 million Ghanaians representing 6% of Ghana's population applied for the US diversity lottery in 2015. A survey by Connor (2018) has revealed that more than 70% of the respondents from Ghana and Nigeria plan to migrate when presented with the opportunity. The case of Ghana is interesting and worth investigating because; it tops the rank in terms of the percentage of people that answered yes in the survey with 75%, followed by Nigeria (74%), Kenya (54%), South Africa (51%), Senegal (46%) and Tanzania (43%). In addition, the socioeconomic background of these developing African countries is somewhat related and may account for reasons why people migrate to seek for better living conditions. Thus, the evidence on Ghana can provide transferable lessons to other developing countries with similar socioeconomic characteristics.

In the contemporary world, the decision for an individual to migrate can be subdivided into macro-elements (mainly independent on individuals), meso-elements (relates with the individual but not controlled by them) and micro-element (which relates with the personal idiosyncratic attitudes of the individual (Castelli, 2018)). To the best of our knowledge, previous studies on migration in Ghana are few. For example, Amuakwa-Mensah et al. (2016) have used the Ghana Living Standard Survey 5 & 6 dataset to undertake a micro-level analysis on migration in Ghana.

However, given the paucity of data, macro-time series analysis is lacking. The few macro-level studies on Ghana have mainly been descriptive analysis (e.g. Anarfi et al., 2003). In an attempt to bridge the literature gap, this study seeks to investigate the macro-level elements by investigating whether improvement in human development as proxied by HDI (well-paid jobs, access to quality education, and health services) will influence net migration as expected by economic theory (see Clemens, 2014). It is imperative to identify the key drivers of net migration to inform the Government of Ghana and help other policymakers to make better decisions on migration policies.

The key research objective is to examine the extent to which HDI (a macro-level indicator) explains net migration in Ghana. The study seeks to provide lessons for countries with similar characteristics in Africa. To achieve this, the study hypothesizes that there is no statistically significant relationship between HDI and net migration, and further estimates it with robust econometric techniques. To the best of our knowledge, this is particularly an important research area which has not been hitherto attempted for a developing country.

This paper proceeds as follows: the "Background of Migration in Ghana" section presents a background of migration in Ghana. The "Theoretical Framework and Model" section provides the theoretical framework and model. The "Empirical Literature" section presents a review of empirical literature. The "Research Methodology" section describes and justifies the research methodology. The "Results and Discussion" section presents and discusses the results. The "Conclusion and Policy Recommendation" section concludes the study with useful pointers from the results.

Background of Migration in Ghana

After independence (i.e. 1957) till the late 1960s, Ghana experienced a rapid growth in net migration. The phenomenon was as a result of relatively better political and economic stability in the West African sub-region, which attracted a lot of migrant workers from neighbouring countries and beyond. The large-scale movement of migrant workers during the period was sustained by massive industrialization drive by the regime at the time which required skilled and unskilled expatriate hands to augment indigenous workforce. Political and economic instability after the late 1960s up to the early 1980s brought a decline in net migration and eventual negative net migration. Owing to the departure of expatriate workforce, rising poverty and social unrest, several Ghanaians migrated to seek employment and political asylum in other countries, especially in neighbouring Nigeria (Aryeetey & Kanbur, 2008; Killick, 2010).

Subsequently, the implementation of International Monetary Fund (IMF)–driven policies sought to forestall the rising poverty levels. The Economic Recovery and Structural Adjustment Programmes from 1983 to 1992 brought a glimmer of economic relieve. The Economic Recovery Programme stabilized key macroeconomic indicators and restored production incentives. The ensuing Structural Adjustment Programme implemented a wide range of institutional reforms which strengthened further the nation's capacity to produce. These reforms opened the economy,

attracting foreign direct investment and labour force into the country. Again, the restoration of political stability through the adoption of democratic governance since 1992 encouraged many Ghanaians, especially those in political asylum, to return home. The era of peaceful constitutional democracy since then has led to a rise in immigration and a decline in emigration, howbeit with a negative net migration.

Since the millennium up to the year 2012, Ghana has experienced growth in net migration largely because of strengthening democratic governance through peaceful transition of governments and pursuing poverty reduction economic policies. This conducive environment provides the necessary security for citizens and foreigners to undertake socio-economic activities without fear or uncertainty. Many skilled Ghanaian workers who hitherto preferred to work in other countries now choose to settle in Ghana. A lot of skilled personnel from other countries immigrated to support the growing skilled manpower needs in industrial activities such as construction, mining, and oil and gas.

However, after 2012, Ghana recorded a negative trend in net migration. This could be attributed to the uncertain political atmosphere after the 2012 elections. The legal challenge of the election results which protracted for over eight months was a deterrent for foreign direct investment. Net migration though negative in recent times is stable in the era of globalization where there is free movement of capital and labour. Awumbila et al. (2019) have observed that emigration of young women for domestic work is on the increase, especially to the Gulf countries. Ghana's performance in migration is now influenced positively by the conducive domestic economy and political stability it offers to residents.

Tables 1 and 2 summarize the trend of migration from and to Ghana for major destinations and origins, using data from the UN DESA (2019a). In Table 1, the trend of Ghanaian migrants to other regions within Africa, Asia, Europe, Latin America and the Caribbean, Northern America (United States and Canada) and the Oceania (Australia and New Zealand) reveals a persistent decline in the percentage of migrants to African countries and a persistent rise in percentage of migrants to other destinations (Europe, Northern America and the Oceania) from 1990 to 2019.

Chronologically, in 1990, the share of Ghanaian migrants to the top four destinations in Africa stood at approximately 57.12%. This declined to about 51.82% in 1995 and further declined thereafter recording less than 50% (43.72%) in 2019. However, migration of Ghanaians to other geographical regions in the World took an appreciable rise from 1990 to 2019. Specifically, the percentage of Ghanaian migrants to the top four (out of the top ten) destinations in Europe increased from 22.58% in 1990 to 23.87% in 1995 and further increased to 24.23% in 2019. The top five (5) destinations of Ghanaian immigrants in Europe are UK, Italy, Germany, Netherlands and Spain. In the case of North America, particularly USA and Canada, the percentage of Ghanaian migrants which was 7.36% in 1990 rose to 12.91% in 1995 and 18.00% in 2010 and further increased to 20.43% in 2019. The predominant destination of Ghanaian migrants to North America is the USA.

A report by the Migration Policy Institute (MPI) in 2015 revealed that about 31% of Ghanaians in the USA are likely to be employed in a professional or managerial occupation. Some Ghanaians are employed in specialized fields such as law, science, engineering, finance, education and human resources. From the report, about 12%

Table 1 Top ten destinations of Ghanaian emigrants

Country	1990		1995		2000		2005		2010		2015		2019	
	Actual	%	Actual	%	Actual	%	Actual	%	Actual	%	Actual	%	Actual	%
Burkina Faso	24,542	6.61	30,522	7.13	29,139	5.88	27,293	4.10	30,810	4.04	32,217	3.56	33,225	3.42
Cote d'Ivoire	99,487	26.80	90,436	21.13	94,236	19.00	98,654	14.81	103,072	13.51	107,490	11.87	111,024	11.44
Nigeria	75,322	20.29	81,276	18.99	90,479	18.25	179,756	26.99	183,351	24.03	222,377	24.55	233,002	24.01
Togo	12,685	3.42	19,575	4.57	26,455	5.33	32,848	4.93	42,991	5.63	46,794	5.17	47,093	4.85
UK	31,872	8.59	42,703	9.98	54,254	10.94	70,045	10.52	97,035	12.72	124,093	13.70	140,920	14.52
Italy	25,093	6.76	29,731	6.95	34,369	6.93	40,455	6.07	44,622	5.85	46,258	5.11	51,364	5.29
Germany	20,822	5.61	21,454	5.01	22,086	4.45	23,382	3.51	24,387	3.20	25,409	2.80	27,872	2.87
USA	20,889	5.63	43,808	10.23	67,237	13.56	89,959	13.51	116,035	15.21	161,082	17.78	173,952	17.92
Canada	6404	1.73	11,477	2.68	16,823	3.39	18,533	2.78	21,260	2.79	22,769	2.51	24,399	2.51
Netherlands	6020	1.62	8266	1.93	10,792	2.18	12,168	1.83	13,222	1.73	14,212	1.57	15,041	1.55
Others	48,026	12.94	48,809	11.40	50,030	10.09	72,897	10.95	86,204	11.30	103,151	11.39	112,733	11.61
Total		100.00		100.00		100.00		100.00		100.00		100.00		100.00

Source: Authors' construct with data from UN DESA, 2019a. Note: Percentage estimates presented in 2 decimal places

Table 2 Top ten origins of immigrants to Ghana

Country	1990		1995		2000		2005		2010		2015		2019	
	Actual	%	Actual	%	Actual	%	Actual	%	Actual	%	Actual	%	Actual	%
Benin	8959	5.43	8928	3.53	9987	5.21	14,044	4.61	13,963	4.14	17,183	4.14	19,338	4.14
Burkina Faso	41,668	25.28	41,526	16.42	46,451	24.24	65,321	21.46	47,703	14.15	58,704	14.15	66,069	14.15
Cote d'Ivoire	4902	2.97	4885	1.93	5465	2.85	25,762	8.46	52,511	15.58	64,621	15.58	72,728	15.58
Liberia	9824	5.96	14,538	5.75	13,084	6.83	50,459	16.57	24,718	7.33	30,418	7.33	34,234	7.33
Mali	3592	2.18	3580	1.42	4004	2.09	5631	1.85	4175	1.24	5137	1.24	5781	1.24
Sierra Leone	119	0.07	1180	0.47	2385	1.24	3354	1.10	1939	0.58	2386	0.58	2685	0.58
Niger	4229	2.57	4214	1.67	4714	2.46	6629	2.18	4915	1.46	6048	1.46	6806	1.46
Nigeria	14,876	9.02	14,826	5.86	16,584	8.66	23,321	7.66	57,056	16.93	70,214	16.93	79,023	16.93
Togo	61,553	37.34	144,121	56.99	72,060	37.61	86,196	28.31	73,412	21.78	90,343	21.78	101,677	21.78
UK	972	0.59	969	0.38	1084	0.57	1524	0.50	1130	0.34	1390	0.34	1564	0.34
Other	14,157	8.59	14,112	5.58	15,783	8.24	22,195	7.29	55,495	16.47	68,300	16.47	76,875	16.47
Total		100.00		100.00		100.00		100.00		100.00		100.00		100.00

Source: Authors' construct with data from UN DESA, 2019a. Note: Percentage estimates presented in 2 decimal places

of Ghanaians in the USA have had a masters, doctorate or a professional degree and 8% have a bachelor's degree as their highest qualification. The report disclosed that about 76% of Ghanaians based in the USA are likely to participate in the US labour force and have an employment rate of 91%. In 2012, the Ghanaian diaspora transferred about $33 million in remittances to Ghana, accounting for about 0.4% of Ghana's GDP (MPI, 2015).

Table 2 shows the top ten origins of immigrants to Ghana. From 1990 to 2019, there have been substantial increases in the share of immigrants from Cote d'Ivoire and Nigeria. Immigrants from Liberia increased from approximately 5.96% in 1990 to 16.58% in 2005. The immigrants from Sierra Leone also increased from approximately 0.07% in 1990 to 1.24% in 2000 after which it declined. The increase in immigrants from these nations can be attributed to proximity and similarity in official language spoken. Nigeria, Liberia and Sierra Leone are English-speaking West African neighbours whiles Côte d'Ivoire shares a common boundary where most of the upstream oil and gas activities in Ghana are concentrated, serving as sources of attraction to migrant workers. Also, Ghana has been the main source of refuge for refugees from Liberia and Sierra Leone. This can be attributed to the civil war in the year 2005 where about 16.57% of immigrants to Ghana came from Liberia.

However, it is evident that the proportion of immigrants from Benin, Burkina Faso, Mali, Niger and Togo has been on the decline from 1990 to 2019. This observation can be attributed to the fact that Benin, Mali and Niger do not share boundaries with Ghana; hence, distance serves as a major barrier. Although Burkina Faso shares common boundary with the Northern parts of Ghana, there are very few economic activities undertaken in the region to attract prospective migrants. From 1990 until 2019, Togo has dominated in the number of immigrants that find Ghana as their destination. The UK features in the top ten immigrants to Ghana due to the colonial ties with Ghana. However, from 1990 to 2019, the share of immigrants from UK to Ghana took a nosedive. There has also been a rising trend in the proportion of immigrants from other countries over the years, increasing from 8.59% in 1990 to 16.47% in 2019.

In summary, we can infer from the above discussion that migration in Ghana follows a similar trend as observed especially in neighbouring countries in West Africa. Generally, migration appears to be influenced by language and better conditions in the destination countries.

Theoretical Framework and Model

The theoretical model follows a simple utility maximization behaviour of a typical rational decision-making household unit. This can be expressed in a general form as:

$$Max\ U = X^a Y^b \tag{1}$$

where a and b are elasticities. In line with De Haas (2011, p.20), we do not assume that 'people are free from constraints, enjoy full access to information, and make

migration decisions with the aim of maximizing their utility'; hence, our constraint is specified as

$$S.t.\ W = Z_X X + Z_Y Y \tag{2}$$

where X and Y represent economic (e.g. unemployment) and social (e.g. infrastructure) home country drivers, respectively. Z_X and Z_Y are corresponding levels of utility (weights) assigned to the economic and social drivers. W is the level of household endowments, including but not limited to level of income, level of education and access to health. Based on Eqs. (1) and (2), the Lagrangian equation is presented as (Eq. 3):

$$L = X^a Y^b + \lambda\left[W - Z_X X - Z_Y Y\right] \tag{3}$$

The first order conditions are:

$$L_X = aX^{a-1}Y^b - \lambda Z_X = 0 \tag{4}$$

$$L_Y = bX^a Y^{b-1} - \lambda Z_Y = 0 \tag{5}$$

$$L_\lambda = W - Z_X X - Z_Y Y = 0 \tag{6}$$

From (4) and (5), we obtain

$$\frac{aY}{bX} = \frac{Z_X}{Z_Y} \tag{7}$$

Equation (7) is now rewritten as $\frac{MU_X}{MU_Y} = \frac{Z_X}{Z_Y}$

Holding all else constant, if the marginal utility of economic factors is positive, thus $\frac{MU_X}{Z_X} > 0$, then net migration will also be positive. This implies that foreigners will migrate to the home country (i.e. immigration will rise). Similarly, if the marginal utility of social factors is positive, thus $\frac{MU_Y}{Z_Y} > 0$, then net migration will also be positive. This implies that foreigners will again migrate to the home country (i.e. immigration will rise). Alternatively, if any of the above arguments are negative, be it economic or social, net migration will be negative, implying that emigration will rise given immigration.

With reference to Eqs. (7) and (6), the corresponding optimal demand functions for economic and social factors influencing migration are given as:

$$\boldsymbol{X}^* = \frac{aW}{(a+b)Z_X} \tag{8}$$

$$\boldsymbol{Y}^* = \frac{bW}{(a+b)Z_Y} \tag{9}$$

That is, economic and social drivers of migration are determined by levels of utility (weights) and endowments of the individual. By implication, utility is maximized

if the equilibrium first order conditions $\boldsymbol{X}^{*}$and/or $\boldsymbol{Y}^{*} > 0$, and the corresponding second order conditions $\boldsymbol{X}^{*'}$and/or $\boldsymbol{Y}^{*'} < 0$. Hence, the likelihood of emigration for an individual is reduced and net migration is positive.

In aggregate terms, we expect a global maximum if $\boldsymbol{X}^{*}$and/or $\boldsymbol{Y}^{*} > 0$, and $\boldsymbol{X}^{*'}$and/or $\boldsymbol{Y}^{*'} < 0$, where net migration will be positive, and immigration will rise. If $\boldsymbol{X}^{*}$and/or $\boldsymbol{Y}^{*} < 0$, $\boldsymbol{X}^{*'}$and/or $\boldsymbol{Y}^{*'} > 0$, then net migration will be negative, that is emigration will rise. Intuitively, if economic and non-economic drivers are lacking in the home country, emigration should be expected.

Following Eq. (8) or (9), we replace wealth (W) with HDI and rewrite the transformed and simplified final equation as

$$\boldsymbol{Q}^{*} = f(HDI, \boldsymbol{Z}) \tag{10}$$

where $\boldsymbol{Z}$ is a vector of socio-economic covariates and $\boldsymbol{Q}^{*}$ is the optimal level of net migration.

From the theoretical perspective, we posit that migration can be attributed to economic (i.e. income and employment) and non-economic factors (i.e. social, cultural, political) (see De Jong, 2000; Massey & Akresh, 2006; Nguyen-Akbar, 2017; Reinhold & Thom, 2009).

Empirical Literature

Several empirical studies have been conducted on the determinants of migration. Most of these studies differ in scope, methodology and location. Based on methodology and location, for example Stark et al. (2009) analyzed how relative poverty influences migration in Poland using regional level data. Employing the Gini coefficient as a measure of relative poverty with cross-sectional fixed effects estimation, the authors asserted that there is a positive relationship between poverty and migration, holding income per capita constant. They discovered further that a stronger desire to migrate is associated with rising absolute poverty among the population. A plausible recommendation emanating from their findings is that policy measures focusing on poverty reduction, such as tax and transfer policies for equitable income distribution, have indirect effects on intentions to migrate. Thus, there is a lesser tendency to migrate when the aggregate poverty gap is reduced. Although this study underscores the fact that income is a key driver of migration, it does not adequately measure poverty from economic and social dimensions.

Some studies employ gravity models in analyzing the proximate and underlying factors of migration. Higa et al. (2019) applied a modified gravity model on demographic data to examine drivers of Japanese municipal-level migration. Focusing on differences in human capital development (measured by the share of university graduates in the municipal population), they showed that people move from municipalities with lesser human capital stock to municipalities with higher human capital stock. That is, municipalities with higher human capital stock have a better chance of receiving more population inflows compared to those with lower human capital. In order to manage population flows, the authors accordingly recommended

education and training schemes to enhance human capital accumulation for better labour mobility.

In addition, Mamertino and Sinclair (2019) examined the relationship between migration and online job search in Europe. Using a standard gravity model on samples of online job seekers, the authors found that international job search is related to international migration. Specifically, the determinants of migration such as distance, language and religion are also key factors influencing job search. The authors thus provide adequate evidence that the gravity model is robust in tracking job search which can serve as an indicator of potential migration patterns. This is innovative as compiling data on migration flows appears to be more difficult compared to job seeking. Thus, job search data can serve as an alternative or proxy to measure migration intentions.

Furthermore, Wesselbaum and Aburn (2019) explored the determinants of international migration using a panel data set of 16 destinations in the OECD and 198 origin countries from 1980 to 2015. With an augmented gravity model, the authors employed a panel vector autoregressive estimation technique and concluded that climate variables are important drivers of migration. They argued that climatic factors explain dynamic processes in migration adjustments and are expected to be pronounced determinants of migration in the future. As a result, migration tends to rise when there is an increase in atmospheric temperatures and incidence of climatic disasters. Though this piece of evidence is intuitive, it was hitherto untested, and as such is a major contribution to the empirical literature. In effect, the authors argue that migration towards OECD countries is an adaptation strategy to deal with the effects of climate change.

Similarly, other studies lay more emphasis on the socio-cultural determinants of migration. De Jong (2000) for example investigated the drivers of migration in Thailand focusing on expectations about future goals and outcomes as well as family norms concerning travel decisions. The study employed a binary outcome model using a representative sample of longitudinal national migration survey for the period 1992 to 1994. Results indicated that expectations, age, gender and income were significant factors influencing permanent and temporary migration behaviour of people. In addition, the constructed measure of family norms proved to be a major indicator of migration behaviour whiles the scope of migrant networking was not a statistically significant determinant of migration intention. The author's analysis establishes that expectations and family norms are key mechanisms for policy initiatives in managing migration flows to Thailand.

Also, Ziesemer (2011) studied how economic opportunities, conflicts, political instability and disasters affect net migrants in 18 developing countries from 1990 to 2000. Using the dynamic system GMM estimation technique, the author revealed that remittances tend to reduce migration as it supports investment and consumption for families back home. This phenomenon implies that lowering taxes and fees on transfers can provide an incentive to enhance remittances which will increase net immigration and vice versa. Considering non-economic factors, the study found an inverted U-shaped impact for people affected by natural and man-made disasters. In other words, people affected negatively by non-economic factors tend to migrate initially and later make a return journey home when conditions are favourable.

In Africa, scores of studies have been undertaken on migration with its proximate and underlying drivers. Particularly, Shimeles (2010) conducted a study on the pattern, trend and determinants of migration in Africa using a blend of national migration data and household surveys from Nigeria, Ghana, Burkina Faso and Senegal. The study observed a higher rate of internal migration compared to international migration in less developed countries. Unfavourable socio-economic conditions in origin countries generally promote higher rate of emigration by highly skilled individuals. In addition, the desire to improve livelihoods was identified as an important driver of internal and external migration. Analysis of household survey data showed that migrants from selected countries tend to be young adults (between 27 and 37 years), predominantly male and generally having some education beyond primary school. Size of the household, network externalities and education of the head of the household are key determinants and characteristics of households that have at least an international migrant.

Utilizing information from international migration and visa databases, Flahaux and de Haas (2016) investigated the evolution and drivers of migration in Africa between 1960 and 2010. Based on conceptual frameworks on development and migration, they observed a reduction in rates of internal migration whiles international migration is on the rise. The authors argued that this trend could be attributed to nationalism and artificial restrictions on mobility among independent countries on the continent. Thus, increasing emigration in Africa is the result of rising levels of economic growth and development which have improved wellbeing across countries, enhancing freedoms and capabilities to migrate. Hence, to the authors, this evidence is contrary to perceived notion that emigration from Africa is predominantly influenced by poverty, conflict and underdevelopment. Governments in Africa are therefore to pursue growth policies whiles ensuring economic freedom and equitable distribution of wealth to forestall loss of active labour force needed for accelerated development in the continent.

In a cross-country study of migration among selected African countries, the Food and Agriculture Organization (2017) established that migration is a widespread phenomenon among households. Adopting a descriptive survey design, the study observed that rural migration is mostly internal whiles international migration is from urban areas. This is attributed to the higher cost involved in international migration. Individuals involved in movements are mainly males within the age bracket of 15 to 34, with relatively higher levels of education. Employment and education, and family connections are the main reasons why individuals would wish to migrate. In effect, household with migrants are wealthier than those without migrants.

Education is widely identified in the literature as an important determinant of migration, with opinion largely in favour of the position that educational attainment enhances the chance of migration (Dustmann & Glitz, 2011; Williams, 2009). Employing retrospective and prospective analytic strategies, Williams (2009) establishes that educational attainment is positively related to migration for men and women in Nepal. Enrolment, on the other hand, reduces the likelihood of migration for both gender roles. Regarding the female gender role, the effect of increased educational attainment and labour force participation has tremendously reduced their

chances of migration compared to men. The author identified that the rate at which women migrate will however shift from gender roles towards economic reasons.

Entrepreneurship has also been identified as a reason behind the drive to migrate. Maj and Kubiciel-Lodzihska (2020) have explored the extent to which entrepreneurial motives influences migration in the care sector in Poland. Underpinned by the grounded theory and with a sample of 42 immigrants in the health sector, the authors found that immigrants do not consider setting up a business venture as a determinant of migration because of difficulties in securing permits, inadequate finances to start-up, language barriers and professional abilities. Although these limiting factors are ever present, immigrants admitted that they will eventually start their own enterprises with time in their new destination. The study does provide practical implications for policymakers to facilitate migrant entrepreneurship, especially migrants from developing countries.

In Ghana, Coe (2012) examined the determinants and effects of migration as perceived by children aged between 8 and 22 years. The study sought to explore how children in southern Ghana envisage life abroad and their expectations in travelling. Using a case study design, the study found that children's desires to migrate are significantly influenced as they grow older. Children are inclined to abandon early hopes to live abroad, preferring to remain home because of family ties. The essence is to acquire a higher level of education in Ghana and being capable to live an independent life abroad. Whiles living abroad eventually, they expressed willingness to send remittances as a sign of reciprocity to relatives.

Kyeremeh (2020) conducted an in-depth interview of 10 Ghanaian football migrants who have re-joined their families to investigate their return travel decisions. Based on a structural conceptual framework, the study found that Ghanaian football migrants decide to return as a result of family ties, desire and a willingness to contribute towards development in the country by starting up a business or investing in pre-existing enterprises. Again, work-related factors such as injuries, aging and non-renewal of contracts encourage footballers to return home. The author's findings presuppose that both economic and non-economic factors influence Ghanaian footballers to migrate to other countries and ultimately return to reintegrate with family and society.

In our opinion, the empirical literature underscores the prominence of how natural and man-made factors work together to influence migration. These proximate drivers of migration seem to be profound in developing countries. Migration induced by natural factors such as flood, extreme weather conditions and climate change is a corresponding human response. Underlying factors such as poverty, expectations and family norms are country specific. We posit that man-made factors including policy, conflict and political systems are key underlying forces driving migration globally.

We also observe from the review of the empirical literature that there is paucity of studies on net migration in Ghana using data on both immigrants and emigrants for a single study. Moreover, we extend the scope of empirical literature, in our effort to incorporate economic, policy, social and market drivers of net migration, which is yet to be tested for Ghana, to draw inference relevant for developing countries, especially

in sub-Saharan Africa. We use a broader index of socio-economic development (HDI) which includes measures of education, health and per capita income.

Research Methodology

In investigating the relationship between HDI and net migration, we first acknowledge that HDI is plausibly endogenous, so we follow Hagan and Amoah (2019) and Korle et al. (2020) who rely on an instrumental variable (IV) approach in addressing endogeneity of regressors and serial correlation of errors. Similarly, we use related endogeneity and serial correlation addressing estimators such as fully modified ordinary least squares (FMOLS, for example see Kwablah et al., 2014; Tetteh & Amoah, 2020), autoregressive distributed lag (ARDL, for example see Asiama & Amoah, 2019) and dynamic ordinary least squares (DOLS, for example see Amoah et al., 2020) for robustness purposes.

We use the two-stage least squares (2SLS) approach to estimate the causal relationship between HDI and net migration. We instrument HDI which is our variable of interest with an interaction of year trend and political foundation of home country (hereafter referred to as *political*) and the natural logarithm of population (*lnpop*) where the results are presented in Table 12 (refer to Appendix). The political foundation is constructed as the democratic period which is coded as one whiles all other periods are coded as zero. Such a dummy construction is not new as it follows the legal foundation dummy as used by Hagan and Amoah (2019). The first stage equation is presented as:

$$HDI_t = \alpha_1 Political_t + \varnothing_2 lnpop_t + u_t \tag{11}$$

The endogenous variable of interest, *HDI*, is defined as the average achievement of a country under three main dimensions, namely a decent standard of living (per capita income), long and healthy life (life expectancy) and access to knowledge (education). As presented by Amoah et al. (2020), the HDI has a minimum value of zero and a maximum value of one. Countries are ranked as low human development (less than 0.550), medium human development (0.550–0.699), high human development (0.700–0.799) and very high human development (0.800 and above). For the purposes of comparison with the rest of the world, Ghana's HDI data is expressed as a ratio of the world's HDI data to represent the share of Ghana's HDI to the World's HDI. Similar to Amoah et al. (2020), we further rescaled the HDI values into percentages for the coefficient of *HDI* to be interpreted as elasticity. Data on HDI was sourced from the WDI, World Bank (2021)

The second stage equation is presented under the following themes: economic (HDI, unemployment), policy (remittances), social (electricity) and market (inflation, credit) drivers of migration which are deemed to be time variant. The main econometric specification is specified as follows:

$$\ln Q_t = \beta_0 + \beta_1 \widehat{HDI_t} + \beta_2 Unemp_t + \beta_3 lnremit_t + \beta_4 Elec_t + \beta_5 Inf_t + \beta_6 FMD_t + \varepsilon_t \tag{12}$$

where *lnQ* is the natural logarithm (ln) of net migration. Net migration is total number of immigrants less the total number of emigrants, including both citizens and non-citizens. Data are 5-year estimates which were balanced using moving averages. To transform the data into natural logarithm for easy interpretation of the results, the minimum value was added across the distribution for all negatives to be positive. This same transformation could have been achieved with plus one. After which, the natural log of the variable was taken. The implication is that a negative coefficient will imply increase in emigration (decrease in immigration) whiles a positive coefficient will imply a decrease in emigration (increase in immigration). The data points before the transformation and after the transformation were plotted and presented in (Figs. 1 and 2). The evidence shows similar distribution which suggests that the transformation did not bias the distribution of the original data. Thus, the data covers the period 1980 to 2020 and was mainly obtained from United Nations Population Division, World Population Prospects: 2019 Revision and the World Development Indicators (WDI), World Bank (2021).

Unemp is unemployment, refers to the annual share of the labour force that is without work but available for and seeking employment. A priori, we expect that an increase in unemployment will increase the number of emigrants; hence, net migration will be positive. Data was sourced from the International Labour Organization, ILOSTAT database and WDI, World Bank (2021).

lnremit is the natural log of personal remittances paid (current US$). Personal remittances comprised personal transfers and compensation of employees. Personal transfers consist of all current transfers in cash or in kind made or received by residents. All other measures considered were found to be correlating with HDI (examples: trade openness, foreign direct investment and official development assistance). A priori, we expect that where foreign policy is favourable, remittances would increase, and all other factors held constant. Thus, where residents received adequate remittances, net migration should be negative. Data on remittances was sourced from the WDI, World Bank (2021), based on IMF balance of payments data.

Elec is referred to as access to electricity which is the percentage of population with access to electricity. Electrification data emanated from industry, national surveys and international sources. This was used as a measure of social infrastructure development that facilitates social development such as lightening, leisure and

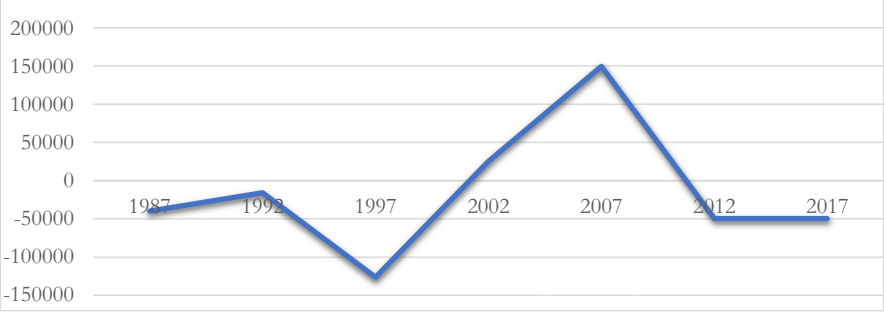

Fig. 1 Plots of net migration (raw data). Source: Authors' construct

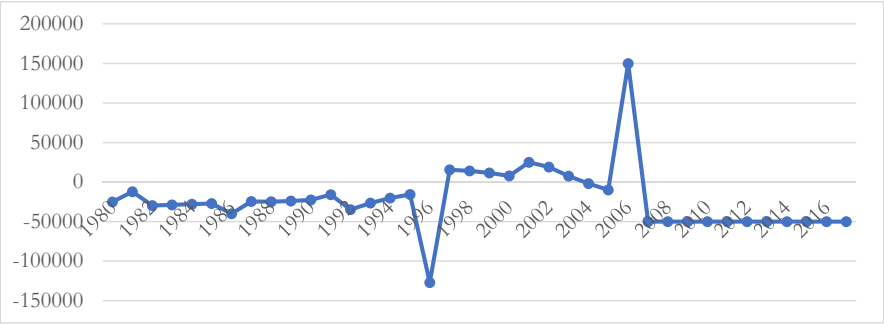

Fig. 2 Plots of net migration (transformed data). Source: Authors' construct

security. This is considered a key component in determining one's wellbeing. We expect that having access to electricity will decrease net migration whiles the reverse is true. Data on electricity was obtained from WDI, World Bank (2021).

Inf is Inflation which is measured by the consumer price index. It reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. A priori, we expect that a rise in the rate of inflation may heighten instability in the goods and services market and can serve as an incentive for people to migrate to another country with a relatively stable general price level. Data on inflation was obtained from WDI, World Bank (2021).

In line with Mensah et al. (2016), *FMD* is financial market development which is proxied by domestic credit to private sector. It refers to financial resources provided to the private sector by financial corporations, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable that establish a claim for repayment. A priori, we expect that a well-developed financial sector will support the private sector for entrepreneurial and small-scale businesses to thrive hence a disincentive to migrate. Data on domestic credit to the private sector was obtained from WDI, World Bank (2021). All other variables are as earlier defined.

Results and Discussion

The negative mean and median values imply that, in Ghana, on the average, citizens emigrate more than foreigners immigrate. Currently, Ghana's average HDI value is 0.596 (59.6%) which implies medium human development. In this study, given that the dependent variable is net migration, we used Ghana's average HDI as a share of the World's average. The average HDI value shows that Ghana's average HDI as a percentage of the rest of the World's average HDI is 76.65%. The distribution of our variable of interest together with the other covariates produces quite a reasonable spread. The distribution of the raw data of net migration and the moving average transformed data are presented in Figs. 1 and 2, respectively.

Unit Root Test of Series

First, as a requirement for time series analysis, we investigated the unit root properties of the series using the Phillip-Perron Test (PP) and Dickey Fuller Generalised Least Squares (DF-GLS) by Phillips and Perron (1988) and Elliott et al. (1996), respectively. Except inflation which is found to be statistically highly significant at levels, all other series are found to be highly statistically significant at first difference. The results presented in Table 3 suggest that there is evidence of stationarity and that we can proceed to test for the long-run equilibrium of our variable of interest.

Structural Breakpoint Tests

Because time series data are prone to structural changes, we examined potential inherent unknown structural breakpoints in the data using the Chow breakpoint test, which offers a more precise check based on Figs. 1 and 2. In Table 4, we investigated a possible structural breakpoint in 1997; the test provides mixed results rendering us redundant in rejecting the null hypothesis.

Again, in Table 5, we estimate a possible break point and found an overwhelming evidence of a break point in 2007 which perhaps is largely attributed to the impact of the global financial crisis of 2007.

Table 3 Unit root test of series

	PP		DF-GLS	
Variable	Intercept	Intercept and trend	Intercept	Intercept and trend
NM	−3.231**	−3.377*	−3.404***	−3.590***
DNM	−14.381***	−22.965***	−9.542***	−9.607***
HDI	−0.226	−1.769	−0.510	−2.3971**
DHDI	−4.995***	−5.058***	−2.722***	−2.827***
UNEM	−1.910	−1.938	−2.442**	−2.667**
DUNEM	−2.995**	−2.927***	−3.006***	−3.009***
Remit	−0.724	−1.504	−0.897	−1.685
DRemit	−5.965***	−7.691***	−6.011***	−6.292***
Elec	−0.927	−2.206	−1.427	−1.476
DElec	−6.740***	−7.252***	−6.523***	−7.449***
Inf	−4.747***	−6.526***	−4.383***	−6.707***
FMD	−2.364	−2.734	−2.356**	−2.781***
DFMD	−6.981***	−6.928***	−6.981***	−6.987***

***$p<0.01$, **$p<0.05$, *$p<0.1$

Table 4 Chow breakpoint test: 1997

F-statistic	1.92926	Prob. *F* (6,22)	0.1063
Log likelihood ratio	20.1985	Prob. chi-square (6)	0.0096*
Wald statistic	15.4340	Prob. chi-square (6)	0.0512

*$p < 0.1$

Test of Long-run Equilibrium

As a follow-up to the unit root test, we examined the long-run relationship among the set of variables using the Bounds testing approach to cointegration. Based on the *F*-statistic of 9.14 (see Table 6) which is greater than the upper asymptotic critical bounds of 1%, we can reject the null hypothesis and conclude that there is cointegration among the variables.

For robustness purposes, the standard Johansen cointegration test (see Table 7) was also applied, and the evidence from the Trace and Eigen values confirmed the results of the Bounds cointegration test.

From Table 8, we present the results from all the five estimators used in providing the empirical evidence to the question: does human development drive net migration in Ghana? All five models present similar results (i.e. negative sign and statistical significance) that suggest that improvement in human development has the tendency to reduce net migration. Thus, immigration will decrease relative to emigration. Using the coefficient of variation in determining the best model, we posit that the IV is our best and preferred model. Its associated *R*-squared value of approximately 0.49 means that 49% of the variation in net migration is explained by the model, implying that HDI is also a key driver of Ghana's net migration, or better still Ghana's emigration. That is, improving the quality of education, access to good health systems and incomes of workers positively affects human capital stock which serves as a strong motivation not to migrate to other countries. Stated differently, countries with lower HDI should expect rising emigration rates of their skilled labour to relatively developed countries at the expense of their own home country. Our finding supports the fact that economic improvement is a key driver of emigration in Ghana and other developing countries with similar characteristics. It is important to acknowledge that HDI is not the only driver of net migration in Ghana. So, to deal with possible omitted variable bias, relevant controls are included in our preferred model to yield model 5. So, the interpretation of our coefficients is based on model 5. All the economic drivers yielded their a priori expectations. That is, there is a negative and statistically highly significant relationship between HDI and the log of net migration. The slope coefficient suggests that if the share of Ghana's HDI to

Table 5 Chow breakpoint test: 2007

F-statistic	18.6432	Prob. *F* (6,22)	0.0000*
Log likelihood ratio	77.9560	Prob. chi-square (6)	0.0000*
*Wald statistic	149.1460	Prob. chi-square (6)	0.0000*

*$p < 0.1$

Table 6 Bounds cointegration test

F-statistic	0.100		0.050		0.025		0.010	
$F_{NM} = 9.14$	$I(0)$	$I(1)$	$I(0)$	$I(1)$	$I(0)$	$I(1)$	$I(0)$	$I(1)$
	4.04	4.78	4.94	5.73	5.77	6.68	6.84	7.84

the World's increases by one percentage point, net migration on the average will decline by approximately 0.06%. Similarly, Cebula (2005) has shown that migration decisions are responsive to quality-of-life factors. Where the quality of life is high, people are easily attracted to migrate.

Another economic driver of migration is unemployment (measured as percent of total labour force). In countries where the unemployment rate keeps soaring, the willingness to migrate to a relatively better country is high, holding all else held constant. In line with expectation, we have evidence of a negative and statistically highly significant relationship between unemployment and net migration. If unemployment increases by one percentage point, net migration on the average will decrease by approximately 0.03%, ceteris paribus. Contrary to the evidence in this study, Cebula (2005) found no statistically significant relationship between unemployment and migration in the USA. This is plausible in that the level of unemployment in a developing country like Ghana provides enough motivation for people to want to seek greener pastures elsewhere unlike a developed country like USA. Even if people will migrate, the size would not be so significant to make an impact.

Again, foreign policy may be considered as an important driver of net migration. If foreign policies permit the free flow of goods and services as well as human beings, then migration will be inevitable. In this study, we considered variables such as trade openness, ODA and remittances as a proxy for foreign policy. Unfortunately, trade openness and ODA were found to correlate with HDI, so remittance was used as the proxy for foreign policy. That is, if the foreign policy is favourable, one would expect in-and-out flow of remittances within a certain allowable space. An increase in remittances is expected to have mixed results depending on the extent of recipient's sufficiency. From our results, we have evidence that there is a negative relationship between remittances and net migration, albeit marginally insignificant.

Differences in social infrastructure developments, say leisure, which is a key component in measuring one's standard of living can also explain why people migrate to other countries. In this study, we used access to electricity as a proxy for determining the extent of social infrastructure development. This is because

Table 7 Johansen cointegration test results

Data trend:	None	None	Linear	Linear	Quadratic
Test type	No Intercept	Intercept	Intercept	Intercept	Intercept
Test type	No Trend	No Trend	No Trend	Trend	Trend
Trace	4	5	5	4	5
Max-Eigen	2	2	2	2	2

*Critical values based on MacKinnon-Haug-Michelis (1999)

Table 8 Long-run regression results

	(1)	(2)	(3)	(4)	Structural break point		(5)
Variables	OLS	ARDL	FMOLS	DOLS	< 2007	> 2007	Second stage IV‡
Economic drivers							
HDI	−0.0242***	−0.0263**	−0.0599***	−0.0597***	−0.0169*	−0.1661**	−0.0549***
	(0.004)	(0.009)	(0.010)	(0.006)	(0.008)	(0.053)	(0.012)
Unemployment							0.0344***
							(0.011)
Policy drivers (proxy)							
Remittance (ln)							−0.0175†
							(0.011)
Social drivers							
Social infrastructure (electricity)							0.0062**
							(0.003)
Market drivers							
Goods market volatility (inflation)							−0.0010**
							(0.000)
Financial market development (credit)							−0.0102**
							(0.004)
Time fixed effects	Yes	No	Yes	Yes	Yes	Yes	No
Constant	6.8682	4.6930***	9.4035***	9.1075***	6.2175***	17.4662***	9.2722***
	(0.306)	(1.159)	(0.742)	(0.447)	(0.626)	(3.865)	(2.361)
Hansen test (p-value 0.31180)							7.099
Observations	40	38	37	35	26	14	39
R-squared	0.31	0.36	0.36	0.51	0.63	0.57	0.49

Dependent variable: net migration (Log) robust standard errors in parentheses ***$p<0.01$, **$p<0.05$, *$p<0.1$, †$p<0.15$. ‡Refer to Table 12 in Appendix for first stage regression results

most social infrastructures are generally powered with electricity. So, one would expect that having access to electricity would also imply having rising levels of social development, holding all else held constant. We found evidence of a positive and statistically significant relationship between access to electricity and net migration. That is, if electricity access should increase by one percentage point, net migration will increase by approximately 0.006%. The plausibility of our results is not farfetched. If residents believe that whatever social infrastructure is available in their home country, a far better service is available in the destination country, then there is a social utility driven motivation for them to want to seek better social services in another country. On the contrary, if the social services have been sufficiently provided in the home country, then there is no incentive for them to travel to other countries as migrants.

For an agrarian- and a commerce-driven economy such as Ghana, it is relevant to evaluate the extent to which market conditions keep people in business or otherwise. Firstly, we included inflation as a measure of goods market volatility. One would expect that if the market conditions were volatile, businesses will not thrive, lay-offs will be common and the quest for greener pastures elsewhere will be inevitable. However, the reverse is true. We found a negative and statistically highly significant relationship between inflation and net migration. The slope coefficient shows that an increase in inflation by one percentage point will averagely induce a decline in net migration by approximately 0.001%. Secondly, we included a measure of financial market development which is commonly found in empirical literature to be proxied by domestic credit to the private sector as a percentage of gross domestic product (e.g. Mensah et al., 2016). This is found to be negative and a statistically relevant driver of net migration. This is plausible because if financial institutions are able to provide the needed financial support for businesses to do well, there will be no motivation for residents to migrate to other countries. However, if the financial institutions in Ghana are unable to support businesses in Ghana, then migration to seek greener pastures will be inevitable.

Given the evidence of a structural break in 2007, we estimated the same relationship between the share of HDI to the world's HDI in percent and log of net migration before and after the structural break. The evidence we have is not different from the estimation covering the whole period. Thus, the evidence provides some degree of robustness to our full sample results. Simply put, improving standard of wellbeing (income levels), access to quality education and health services can reduce the extent to which human capital migrates to seek greener pastures elsewhere.

Furthermore, we validate our results using bootstrapping for the parametric models and a non-parametric model. For the parametric, the four unique parametric models are re-estimated with 500 replications for the variable of interest, HDI. The parametric results converge with the earlier results and affirm the evidence that improvement in human wellbeing as proxied by HDI reduces net migration (Table 9).

For the non-parametric model, which is estimated under a distribution free assumption, we find an evidence that corroborates with the parametric estimators

Table 9 Bootstrapping regression results

	(1)	(2)	(3)	(4)	(5)
Variables	OLS	ARDL	FMOLS	DOLS	IV
HDI	−0.0546***	−0.0262**	−0.0599***	−0.0597*	−0.0262***
	(0.008)	(0.010)	(0.009)	(0.032)	(0.004)
Time fixed effects	Yes	No	Yes	Yes	No
Constant	9.0340***	4.6938***	9.4035***	9.1075***	7.0192***
	(0.560)	(1.207)	(0.631)	(2.322)	(0.278)
Replications	500	N/A	500	500	500
Observations	38	36	37	35	40
R-squared	0.451	0.357	0.375	0.506	0.312

Dep. variable: net migration (Log), bootstrap-standard errors in parentheses except for the ARDL

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

and show that there is an inverse relationship between HDI and net migration in Ghana (Table 10).

Conclusion and Policy Recommendation

The study of human development and migration draws attention to the problem of socioeconomic development and migration, as a grey field, which demands further empirical investigation. Sobczak-Szelc and Fekih (2020) concluded that migration is used by households as one of several adaptation strategies and is part of a wider process of socio-economic transformation in which people leave in order to cope with or adapt to environmental changes or to optimize their livelihood. Consistent with the findings of this study, net migration in Ghana can be understood from a socioeconomic background. We found that improvement in human development through improved education, health systems and income levels can moderate the apocalyptic representations of a massive exodus of desperate Ghanaians pushed out of the country. Therefore, migration can be misunderstood if it is considered purely from an economic perspective.

In Ghana, the problem is to draw out the connections between the crises of increasing socioeconomic policy incongruence and democratic party politics on

Table 10 Non-parametric regression results

Kernel type	Bartlett D.Migration	Parzan D.Migration	Quadratic spectral D.Migration	Quadratic spectral D.Migration
D.HDI	−0.0186	−0.0113	−0.1717	−0.0103
Bandwidth (Newey-West/Andrews)	9.214	2.278	10	20.889
DoF adjustment	0	0	0	0
VAR pre-whitening (Var Lag)	No	1	No	2

Dependent variable: the difference of net migration (D.Migration), *DoF* degree of freedom

migration controls, on one hand, and practical realities of the migrants, on the other hand. Ghana has put in place national migration policy framework, which is currently facing policy and political incongruence, and the country's migration policy, including Diaspora Engagement Policy and Labour Migration Policy have failed to help control migration (Mouthaan, 2019). The political developments in Ghana including frequent change of governments and increasing party politics have impeded the implementation of the various migration polices intended to reduce net migration. On the brighter side, these migration policies were intended to improve the quality of life by improving education, health system and income levels. The solution is that elected leaders and bureaucrats within national policy institutes and departments need to understand the distinction between political rhetoric and policy formulation and implementation (de Haas, 2008). Regarding the practical realities, it is obvious that most of the youth intending to leave and have eventually left have done so because of the socioeconomic exigencies within the country and therefore any political rhetoric and policy formulation and implementation should reflect the realities of those who have left and are willing to leave the country for a better life elsewhere. Therefore, if these socioeconomic policies from various governments do not address the socioeconomic expectations of the youth who are leaving and those who are willing to return, then, net migration might be unfavourable.

The key research question is does improvement in human development as measured by HDI drive net migration in Ghana? This study relies on a secondary data from various credible sources and a regression analysis to establish that improving HDI is negatively associated with net migration. The study calls for strategic efforts towards improving HDI in the home country as it can help retain skilled labour who hitherto considers migration to a developed country as the option for a decent living.

Given the paucity of empirical evidence of the relationship between HDI and net migration, we call other emigration-prone countries to investigate and establish the extent to which improvement in HDI will drive net migration. This will guide policymakers on the extent to which improving wellbeing as proxied by HDI will influence net migration.

The key limitation to this study is the migration data structure. Although the transformed data mimics the distribution of the original data, it goes without saying that there is paucity of time series data on net migration. Indeed, a conscious effort towards compiling and making such time series data available is critical for empirical studies relevant for home and host countries' policy decisions.

Appendix

Table 11

Table 11 Descriptive statistics

Statistics	*Q*	lnQ	HDI	Unempl	lnremit	Elec	inf	FMD
Mean	− 22,139.2	5.01	76.65	6.15	16.14	49.23	27.03	25.12
Median	− 25,251.18	5.01	76.05	5.54	15.61	43.70	18.03	24.57
SD	39,798.46	0.12	2.61	1.51	1.74	17.08	25.11	5.37
Skewness	1.73	1.23	0.56	1.28	2.45	0.54	2.68	0.52
Kurtosis	10.99	5.56	1.97	3.94	7.45	1.81	10.27	2.80
Min	− 126,999	4.89	73.24	4.57	14.98	30.60	7.13	16.38
Max	150,000	5.44	81.53	10.36	21.68	79.30	122.87	39.30
N	41	40	41	41	41	41	41	41

Q implies the raw data and InQ is the transformed data in natural logarithm (ln) form. *SD* standard deviation

Table 12 First stage regression results

	First stage
Variables	IV
Political foundation × year trend (*political*)	− 2.2185***
	(0.666)
Population (ln)	19.2311***
	(1.891)
Constant	− 246.3587***
	(31.613)
Observations	41
R-squared	0.856
F (2, 38)	113.39***

Dependent variable: HDI

Standard errors in parentheses

***$p<0.01$, **$p<0.05$, *$p<0.1$

Abbreviations HDI: Human Development Index; ODA: Official Development Assistance

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Author Contribution Apart from the corresponding author bringing the idea and undertaking the estimations, all sections were shared equally by the authors.

Data Availability Data is available in the WDI Public Dataset. Data will be shared upon request.

Declarations

Ethics Approval and Consent to Participate Not applicable.

Consent for Publication Not applicable.

Competing Interests The authors declare no competing interests.

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