From Brain Gain to Brain Drain: The Impact of Promoting Educational Development in Low-Middle Income Countries on Emigration Patterns

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Bachelor Thesis

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The Impact of Promoting Educational Development in Low-Middle Income Countries on Emigration Patterns

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Submission Date: 24.05.2024

Referencing style: APA 7th edition

Word count: 7629

Publication Statement: Public

Abstract

Education serves as a pivotal driver of societal advancement, yet persistent obstacles hinder universal access to quality education in low-middle-income countries. Concurrently, the phenomenon of brain drain, characterized by the migration of skilled individuals to foreign shores, poses a considerable challenge to these nations. This study employs linear regression analysis to delve into the impact of educational assistance on emigration rates, with a particular focus on the dynamics of brain drain.

Drawing from diverse theoretical frameworks, including Schumpeter's theory and insights gleaned from entrepreneurship studies, this research formulates hypotheses to elucidate the relationship between educational development and emigration. It undertakes a comprehensive examination of perspectives surrounding brain drain and delineates the role of education in nurturing sustainable development, with the overarching goal of unraveling the intricate interplay between education and emigration.

This research contributes to the discourse on development by offering evidence-based insights into the complications of education assistance affecting brain drain. By understanding the nexus between education and emigration, policymakers can formulate targeted strategies to harness youth talent and drive economic progress in low-middle-income countries, without driving them abroad.

Keywords: support and development of education, brain drain, emigration, low-middle-income countries

Acknowledgments

With a heart full of gratitude, I would like to extend my deepest appreciation to those who have played a significant role in shaping my journey and supporting me along the way.

To my sister Alexia, who has been my unwavering supporter and number one fan throughout this journey. Your belief in me has been a constant source of inspiration and motivation.

To my mum Cinzia and my dad Claudio, whose unwavering support and encouragement have allowed me to pursue my passions and follow my dreams. Your guidance and belief in me have been invaluable.

To my uncles, Nicola and Andrea, for always encouraging me to chase my dreams and never giving up on what I believe in. Your belief in me has given me the strength to keep pushing forward.

To Federico, who entered my life and provided the spark I needed. Your presence has illuminated my path and infused me with renewed energy and inspiration.

To every person who has crossed my path and offered kind words, valuable advice, and support along the way. Your contributions have made every moment of this journey more meaningful and memorable.

And finally, to myself, for persevering through challenges and obstacles, and for having the courage and determination to pursue my goals despite any setbacks. This achievement is a testament to my resilience and determination.

Thank you all for being a part of this journey and for your unwavering support. I am truly grateful for each one of you.

With heartfelt gratitude.

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Introduction

Education, vital for societal needs and embodying liberty, is a unifying force (Bhardwaj, 2016). However, achieving universal access faces significant hurdles. Millions of children are denied education, leading to dropout or inadequate schooling (UNESCO, 2014). The 'learning crisis' is recognized globally through Sustainable Development Goal 4, focusing on inclusive, high-quality education (Hossain & Hickey, 2019). This crisis affects all countries, socioeconomic classes, genders, and social strata, with low-income nations encountering the greatest challenges (World Bank, 2018). Despite progress in primary education, addressing issues like poor teaching quality and low educational attainment remains complex (Bruns & Schneider, 2016).

Contemporary education systems mirror competitive consumer cultures, crucial for socioeconomic advancement (Kayani et al., 2017, p. 76). Education fosters economic growth, and social cohesion, and reduces disparities, expanding job opportunities regardless of gender or ethnicity. Prioritizing education reduces global inequalities and builds individual skills for socioeconomic advancement and sustainable financial systems. Education is recognized for lifting people out of poverty and addressing skill gaps, impacting economic well-being, social harmony, and public welfare (p. 77). However, what opportunities await individuals after completing their education in these countries?

Brain Drain (BD) significantly affects developing nations (Adeyemi, 2018). It remains a pressing concern, with theoretical discussions intersecting global geopolitics. African perspectives advocate for shifting from BD to brain gain, while the EU proposes talent partnerships (Saib & Musette, 2023). Anelli et al. (2023) identify four components contributing to this effect: reduced entrepreneurial propensity, the selection of young, educated emigrants, negative effects on firm creation, and positive selection of characteristics linked to entrepreneurship. Entrepreneurship demands creativity, risk-taking, and adaptability, traits that also correlate with emigration propensity (Bütikofer & Peri, 2021). High emigration rates risk losing entrepreneurial potential, particularly problematic for developing countries (Anelli et al., 2023). From the topics raised above a question emerges:

How does promoting educational development among youth in low-income countries affect emigration?

This research endeavors to delve into diverse perspectives on the development of education and its interplay with emigration, utilizing a theoretical framework grounded in the BD phenomenon. Specifically, it will employ Schumpeter's theory of innovation and the role of entrepreneurship to analyze how nurturing education influences both current and future decisions regarding emigration patterns. The quantitative analysis will center on comprehending the correlation between investment

in education and emigration rates. By scrutinizing these trends, the thesis aims to elucidate how varying degrees of emphasis on education impact migration dynamics. Through examining key indicators such as discourse surrounding the promotion of education, BD, and youth landscape, the thesis will assert that countries with differing investments in education exhibit distinct migration patterns. The methodology employed in this research will entail a linear regression, facilitating a nuanced understanding of the intricate relationship between education and emigration. The findings of this research will enrich the literature on the development of education, BD, and migration by underscoring the pivotal role of education in shaping current migration patterns. Additionally, the study will provide insights into potential policy implications for countries seeking to improve education address BD, and effectively manage migration flows in the future.

This research will embark on exploring diverse perspectives on BD, examining how it intersects with migration. The theoretical framework will elucidate the multifaceted impacts of BD on migration patterns. The analysis will delve into the complexities of these relationships, shedding light on the underlying mechanisms. Finally, the conclusions drawn from this investigation will be summarized, offering insights into the implications of BD on migration and its broader socio-economic ramifications.

Literature Background

The primary focus of this thesis centers on exploring the intricate relationship between fostering education and emigration (Brain Drain) in low to middle-income countries. The review critically analyzes whether educational initiatives can effectively tackle the challenges posed by BD, such as promoting economic development. It delves into diverse viewpoints regarding the impact of BD ranging from viewing it as a minor obstacle to raising significant concerns about exacerbating inequalities. The review underscores the necessity for additional research in this area, given the contested nature of the concept (Cha'ngom, 2020).

Brain Drain Over Time

Brain Drain (BD) is defined by the Cambridge Dictionary (2024) as "the situation in which large numbers of educated and very skilled people leave their own country to live and work in another one where pay and conditions are better". The phenomenon known as BD, referring to the migration of highly skilled individuals from developing to developed countries, gained recognition as a notable trend in the increasingly globalized world of the 1960s. Over the decades, economists, political scientists, and more recently, political philosophers, have shown a growing interest in the implications

of BD and potential public policy responses to it (Volacu & Terteleac, 2021, p. 127). Opinions on the impact of BD on developing countries differ. Limitations persist, including a lack of empirical evidence on educational subsidies provided to migrants, neglect of migrants' well-being in assessing BD's net effect, ambiguity regarding skilled migrants' contribution to remittances, and the absence of analysis on evolving gains and losses over time (Cha'ngom, 2020).

The Neutral Vision

The neutralistic view from the 1960s suggested that BD might not necessarily be detrimental, as migrants often contribute to their home countries through remittances or by leaving behind assets. This view argued that in a market economy, BD's effects should be seen primarily in short-term adjustment costs or market inefficiencies. The idea was that BD could lead to increased welfare for everyone, especially if migrants' incomes abroad rise and their departure doesn't negatively affect those left behind. Additionally, under an international trade framework, BD might even increase global welfare, although it could result in some loss of externality to the country of emigration (Scott & Grubel, 1966; Johnson, 1967; Berry & Soligo, 1969).

The Pessimistic Vision

The pessimistic view of the 1970s challenged the neutral perspective, highlighting potential negative consequences. It argued that BD could lead to significant losses for countries losing skilled individuals, particularly if there were large shifts in labor or if there were strong externalities or government subsidies involved. Studies in this strand emphasized factors such as labor market rigidities, informational imperfections, and the widening development gap between sending and receiving countries. They suggested that BD could exacerbate income inequality and hinder innovation and technological adoption in sending countries (Bhagwati and Hamada, 1974; Bhagwati, 1976; Hamada and Bhagwati, 1975; McCulloch and Yellen, 1977; Haque and Kim, 1995).

The Optimistic Vision

In the mid-1990s, an optimistic view emerged, suggesting that BD might not necessarily trap developing countries in poverty. This perspective proposed that BD could foster human capital accumulation and increase productivity in source countries, leading to improved economic performance. It argued that if emigration was not certain, BD could have a positive "brain effect" outweighing the "drain effect." The optimal level of BD was seen as striking a balance between the benefits of emigration and the costs of skill depletion (Mountford, 1997; Stark, Helmenstein, & Prskawetz, 1997; Beine, Docquier, & Rapoport, 2001).

These different perspectives offer nuanced understandings of the complex phenomenon of BD, ranging from neutral assessments to pessimistic warnings and optimistic hopes for its impact on developing countries (Cha'ngom, 2020).

Sustainable Education

Sustainable education combines the principles of sustainability and education. Sustainability seeks to improve life quality by considering environmental, social, and economic factors (Jeronen, 2013). Education involves gaining knowledge, sharing skills, enhancing reasoning, and preparing individuals for life (Jeronen, 2022). Addressing current challenges necessitates a significant change in mindset and behavior towards sustainable lifestyles. According to Sterling (2008), SE can drive this cultural shift. He defines SE as a transformation in educational practices, integrating sustainability into both theory and application with critical awareness. This approach underscores the importance of fostering human potential while upholding social, economic, and ecological well-being, acknowledging their interdependence (Jeronen, 2022).

Many developing nations in the contemporary world understand that sustainable education must be promoted. There exists significant potential for a range of social reforms to enable the establishment of socially equitable societies, achieve sustainable development, and progress towards fulfilling developmental capabilities, through the promotion of sustainable education (Tokarev, 2019). Contemporary research is increasingly focusing on issues surrounding sustainable education and BD, aiming to comprehend their contributions to the concept of sustainable development in society and the most effective ways to implement its principles through education. Attaining the necessary skills to realize the concept of sustainable development over the long term is crucial for achieving this goal (Usman et al., 2024).

Traditional educational methods often are not enough, as educated individuals move abroad for better opportunities (Parker, 2022). In contrast, SE provides a framework that not only educates but also fosters a commitment to local development. SE ensures education is relevant, quickly adapts to changing circumstances, and cultivates students' adaptability, creativity, self-reliance, hope, and resilience. By blending the best elements of liberal education with innovative concepts of transformative education, capacity building, creativity, and adaptive management, SE forms a key component of the new SD program at all educational levels (Jeronen, 2022).

Moreover, sustainable education is characterized as an ongoing journey that begins in early childhood and extends through higher education, with supplementary learning opportunities tailored for older individuals. The objective of higher education is to furnish students with the competencies and

expertise that can bolster their job opportunities, harmonizing educational benchmarks with the demands of the professional realm. Additionally, emphasis is placed on the imperative of undertaking empirically grounded research across diverse domains pertinent to sustainable education. These investigations strive to formulate appropriate principles, instill values and mindsets, employ efficient pedagogical approaches, and create assessment methods to gauge the efficacy of educational programs (Usman et al., 2024).

Education, Youth, and Migration

The macroeconomic situation of several developing economies has deteriorated over decades due to BD, affecting the labor systems of these countries and constraining resources available for national development (World Bank, 2019). While Africans living abroad have contributed significantly to the continent's foreign exchange revenues, the negative impact on their home countries outweighs the benefits. BD poses a significant challenge to growth and development (Adeagbo & Ayandibu, 2014).

Remittances from overseas act as a notable motivator for migration. Nevertheless, research is scarce regarding the tangible effects of sustainable education on BD. While certain studies propose that BD can bolster economic development in receiving nations, there is a dearth of research on how sustainable education might alleviate BD to foster sustainable economic growth and attain universal education objectives. Given these research gaps, this study seeks to enrich the existing literature by investigating whether sustainable education could serve as a means to tackle the challenge of BD (Usman et al., 2024).

Over the past five decades, many talented young people from developing African countries have pursued higher education and lucrative careers in developed nations such as Australia, Canada, Norway, the United Kingdom, the United States of America, and New Zealand (Konduah, 2018, p. 1). These youths seek better facilities, remuneration packages, and incentives, often choosing not to return to their home countries after their studies (pp. 1-2). This situation reflects Africa's struggle to provide compelling reasons for its qualified talents to stay or return home following education abroad, as noted by a former pro-vice chancellor of the University of Ghana (p. 2).

Advancements in science and technology, alongside a scarcity of skilled individuals in developed nations, have reignited this phenomenon (Eassys, 2017). Some migration analysts assert that developed countries depend on trained professionals and intellectual migrants to bridge their professional disparities (Abejide, 2008). Termed "brain drain" for developing nations and "brain gain" for developed ones, this scenario carries implications for both regions (Kelo & Wächter, 2004). Nevertheless, alternative viewpoints suggest a "brain gain" for developing countries, citing the

substantial remittances transferred from developed to developing nations (Eassys, 2017). Various factors contribute to "brain drain or gain," including economic prosperity, improved quality of life, and higher salaries. Nonetheless, some argue that the causes of “brain drain or gain” extend beyond economic challenges to encompass education and other factors (Konduah, 2018, pp 1-2).

Migration patterns exhibit distinct trends based on educational attainment levels, with nuanced disparities observed between genders (Zlotnik, 2019). Notably, individuals with only a primary education constitute the largest cohort migrating, followed closely by those possessing tertiary education qualifications. Conversely, emigration rates are notably lower among individuals with secondary education, suggesting a potential lack of incentive for migration within this demographic. Those with minimal educational attainment tend to migrate to regions where unskilled labor is scarce, capitalizing on opportunities in environments where such labor is in demand (Xu & Sylwester, 2016, p. 403).

Furthermore, individuals with tertiary education credentials may experience heightened demand in high-income countries, driven by skill-biased technological advancements or synergies with human capital. Conversely, individuals possessing solely secondary education qualifications may find themselves in a relatively scarce position within lower-income countries, lacking the requisite human capital to command significant demand for their services in Organization for Economic Co-operation and Development (OECD) nations (Xu & Sylwester, 2016, p. 403).

The emigration of highly educated young individuals has the potential to deprive origin countries of valuable entrepreneurial talent. The authors' analysis reveals that a one standard deviation increase in the emigration rate correlates with a substantial 4.8% decline in firm creation within the local labor market of origin (Anelli et al., 2023, pp. 1-2).

Theoretical Framework & Hypothesis

Understanding the relationship between educational development and emigration is critical in the global context. This framework explores two hypotheses regarding this relationship:

Alternative Hypothesis (H1): Promoting educational development in low-middle-income countries increases emigration rates.

Null Hypothesis (H0): Promoting educational development in low-middle-income countries does not affect emigration rates.

These hypotheses aim to unravel the intricate dynamics between educational development and emigration, offering insights for policymakers and researchers. This hypothesis proposes that despite efforts to improve education, other factors such as economic instability, political turmoil, or lack of job opportunities may remain significant drivers of emigration, thus nullifying any potential impact of educational development initiatives.

Schumpeter theory

Schumpeter is widely recognized as a seminal figure in the field of innovation studies, often credited as its founding father. His significance stems from his pioneering efforts to integrate innovation and entrepreneurship into economic theory as fundamental components crucial for understanding the dynamics of economic development, comparable in importance to the concept of equilibrium (Schumpeter, 2010).

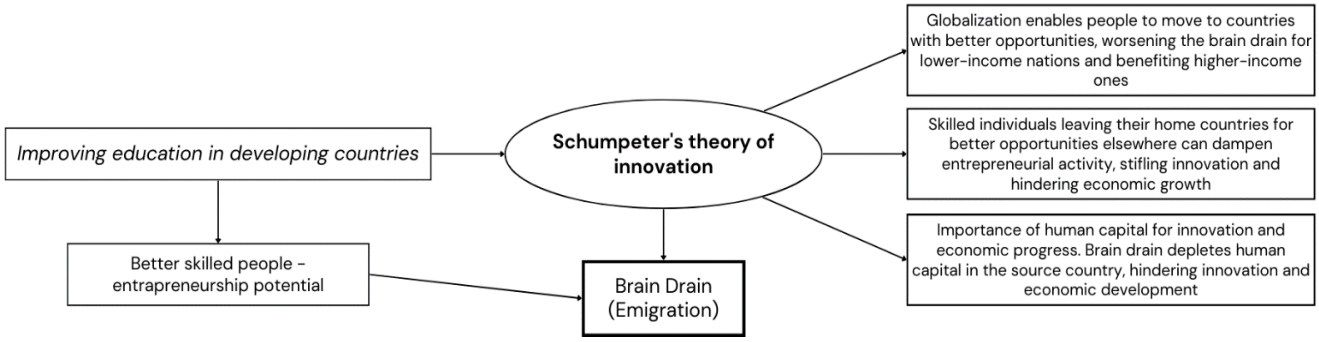
Schumpeter's definition of innovation as "setting up a new production function" remains highly regarded within the field despite its simplicity. This definition underscores innovation as a process encompassing changes in various economic elements, including products, production processes, and markets (Blok, 2021). Additionally, Schumpeter distinguishes innovation from invention by emphasizing its implementation aspect, wherein it involves modifying resource composition and distribution. This definition's broad applicability underscores the significance of innovation studies within economics (Dosi et al., 2017). Schumpeter recognized the importance of human capital in driving innovation and economic progress. BD involves the emigration of skilled and talented individuals from one country to another, leading to a loss of human capital in the source country. This loss can have detrimental effects on innovation and economic development, as skilled individuals are often crucial for driving technological advancement and entrepreneurship.

Another key contribution of Schumpeter is his delineation of entrepreneurship as a distinct economic function separate from managerial and capitalist roles. Entrepreneurship, according to Schumpeter (2010), catalyzes economic change within decentralized systems, leading to creative destruction—a process where entrepreneurial profits emerge alongside the simultaneous destruction of existing rents and quasi-rents. This linkage between innovation, profits, and losses underscores the relevance of entrepreneurship in analyzing business competition and economic sector development (Callegari & Nybakk, 2022, p. 2). Entrepreneurship is a key driver of economic dynamism. When skilled individuals leave their home countries due to better opportunities elsewhere, it can dampen entrepreneurial activity in the source country. This can stifle innovation and hinder economic growth, as the loss of entrepreneurial talent deprives the economy of potential new ventures and job creation.

Schumpeter also elucidates the interplay between entrepreneurial and capitalist functions, highlighting the tension between the need for liquidity by entrepreneurs and the role of the financial system in allocating resources (Graça Moura, 2015). This tension shapes the dominant form of gains and losses generated by the innovation process, thereby influencing both production and financial markets (Callegari & Nybakk, 2022, p. 2). Globalization facilitates the movement of goods, services, and people across borders. BD is often exacerbated by globalization, as it allows individuals to easily migrate to countries with more favorable economic conditions and opportunities. This mobility of talent can lead to uneven development across countries, with low- to middle-income countries experiencing BD while high-income countries benefit from an influx of skilled workers.

In summary, Schumpeter's theoretical framework provides a comprehensive understanding of innovation and entrepreneurship phenomena across various levels of analysis. Despite its enduring influence, challenges persist in translating Schumpeterian theory into empirical studies, partly due to its abstract nature and Schumpeter's strict differentiation between theoretical and practical concerns. Consequently, while Schumpeterian theory attracts attention from scholars in various domains, its implementation in empirical fields like forestry studies has been hindered by misconceptions, limiting its practical applicability (Callegari & Nybakk, 2022, p. 2).

Figure 1. Scheme of Schumpeter's theory of innovation leading to emigration (Brain Drain)



Own creation based on the following articles: Schumpeter, 2010; Dosi et al., 2017; Callegari & Nybakk, 2022

Entrepreneurship

A primary catalyst for the departure of highly educated youth stems from a confluence of factors such as limited job opportunities, inadequate employment prospects, substandard living conditions, and restricted social mobility. These collective circumstances, commonly called 'push factors', drive educated individuals to seek opportunities abroad, resulting in emigration and overseas employment. The influence of government policy interventions on this trend is pivotal, with a particularly efficacious strategy being cultivating entrepreneurial avenues (Munawar, Gul, & Noreen, 2021, p.

76). The research underscores a positive correlation between escalating unemployment rates and an increased propensity towards entrepreneurship, suggesting that entrepreneurial endeavors could serve as a mechanism to mitigate the BD phenomenon. However, despite the implementation of various incentives and initiatives, there is an observed decline in local entrepreneurial activity. Munawar, Gul, & Noreen's study posits a correlation between the surge in BD and the diminishing landscape of entrepreneurship, highlighting the need for targeted interventions to reverse this trend (2021, p. 76).

Schumpeter's theory highlights the need for a distinct type of individual, characterized by being an active agent driven by specific motivations, such as autonomy and personal accomplishment. It is these motivations that set entrepreneurs apart from non-entrepreneurs. The action-oriented nature of the Schumpeterian entrepreneur creates a theoretical connection with the model of motivational values. This perspective aligns with the idea that values, due to their motivational nature, can elucidate agency in entrepreneurship (Morales et al., 2018, p. 244). Entrepreneurship involves individuals organizing, managing, and taking risks in business to create economic value. Derived from the Old French verb "entreprendre," meaning "to undertake," it is a key factor of production in economics, alongside land, capital, and labor. It is pivotal in capitalist economies, often involving high-risk ventures with innovative strategies to sell existing products or services or introduce new ones (Costa, 2024, p. 1). Entrepreneurship is a key element in mitigating the emigration of educated people from low-middle countries because it creates possibilities and opportunities for growth.

Entrepreneurship training programs

Entrepreneurship training programs operate on the premise that the cultivation of entrepreneurial skills can mitigate the challenges often presented by a lack of formal education, which serves as a barrier to accessing traditional employment opportunities (Laney, 2013). Implicit in these training endeavors is the belief that essential entrepreneurial skills, not inherently possessed by individuals, can be developed through structured programs. The nature of entrepreneurship programs varies significantly based on the specific training needs, contextual factors, and target population leading to diverse classifications of such programs (Garcia & Ustymchuk, 2020, pp. 72-73)

Valerio, Parton, and Robb (2014) distinguish between entrepreneurship education and entrepreneurship training programs, with the former encompassing formal academic initiatives targeting students at secondary and tertiary levels, and the latter comprising informal training options catering to a diverse range of potential users. Entrepreneurship training programs target various demographics, including vulnerable or unemployed individuals, necessity-driven entrepreneurs, skilled innovators, and practicing entrepreneurs across the spectrum from micro-enterprises to high-growth potential ventures (Valerio et al., 2014). The overarching goal of such training is to enhance

socio-emotional and technical entrepreneurial skills, thereby fostering entrepreneurial activities and outcomes such as employment rates and profitability (Garcia & Ustymchuk, 2020, pp. 72-73)

Numerous studies have underscored the positive associations between entrepreneurship training and various entrepreneurial indicators. These include increased entrepreneurial intentions, skills, self-efficacy, need for achievement, internal locus of control, and actual business outcomes such as improved performance, increased entrepreneurial activity, and a higher likelihood of business initiation and ownership (Bennett & Barkhuizen, 2014; Tambwe, 2015). However, the long-term effectiveness of training interventions in terms of business sustainability and profitability tends to diminish over time (Fairlie, Karlan & Zinman, 2015; Berge, Bjorvatn, & Tungodden, 2015).

Despite the abundance of evidence highlighting the individual and business-level impacts of entrepreneurship training, its broader effects on unlocking the economic potential of individuals and communities remain challenging to isolate and substantiate (Bettcher & Mihaylov, 2015). Various factors moderate the effectiveness of entrepreneurship training, including individuals' education levels, prior work experience, motivation, interpersonal skills, and access to resources such as capital and social networks (Wiger et al., 2015; Garcia & Ustymchuk, 2020, pp. 72-73).

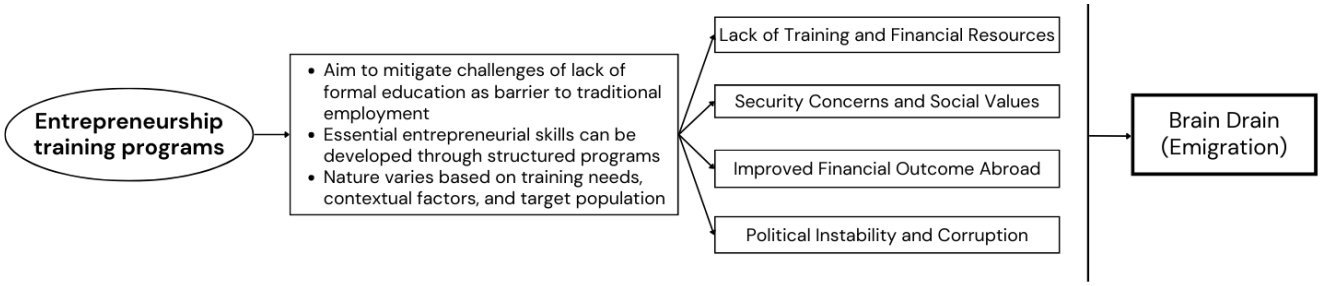
Entrepreneurship training programs aim to empower individuals in low-middle-income countries, where limited formal education obstructs traditional employment avenues. However, akin to the reasons behind the BD, obstacles such as unemployment, underemployment, and political instability hinder the adoption of entrepreneurship as a viable career choice. Personal factors like seeking better living standards or professional growth motivate migration, depriving nations of skilled talent crucial for entrepreneurial endeavors. Moreover, complex regulations and lack of financial resources impede both entrepreneurship and the retention of skilled individuals. Addressing these barriers not only enhances the effectiveness of entrepreneurship programs but also mitigates BD, fostering sustainable economic development (Munawar, Gul, & Noreen, 2021, p. 84).

Interpersonal factors, such as social capital and competence, play a crucial role in entrepreneurial success, particularly in low-income communities where access to resources and networks may be limited. While social capital facilitates access to knowledge, cooperation, and funding, social competence enables entrepreneurs to effectively leverage their social networks and capitalize on business opportunities (Lans, Blok & Gulikers, 2015). However, entrepreneurs in deprived communities often rely on homogenous social networks, hindering their access to diverse resources and opportunities for business growth (Williams, Huggins & Thompson, 2018). (Garcia & Ustymchuk, 2020, pp. 72-73)

Moreover, societal factors, including regulatory frameworks, economic conditions, and the availability of support systems, significantly influence entrepreneurial outcomes (Wiger et al., 2015). The geographical context and social construction of entrepreneurship within communities further shape entrepreneurial ecosystems, with disparities in resources and opportunities existing between low-income areas and urban centers (Kugler et al., 2017; McKeever, Jack, & Anderson, 2014; Garcia & Ustymchuk, 2020, pp. 72-73)

People are reluctant towards entrepreneurship due to a lack of training and financial resources. Instead, they seek employment abroad where personal skills yield quick returns. Migration promises immediate financial rewards compared to the uncertain returns of starting a business. Security concerns and social values also play a role, as migration offers higher living standards and avoids the risks of entrepreneurship in unstable environments. Political instability and corruption further discourage entrepreneurship and contribute to BD. These factors driving migration mirror the barriers to entrepreneurship, emphasizing the need for comprehensive strategies to foster sustainable economic development (Munawar, Gul, & Noreen, 2021, p.84).

Figure 2. Scheme of Entrepreneurship factors leading to emigration (Brain Drain)



Own creation based on the following articles: Laney, 2013; Valerio et al., 2014; Bettcher & Mihaylov, 2015; Wiger et al., 2015; Munawar, Gul, & Noreen, 2021; Lans, Blok, & Gulikers, 2015; Williams, Huggins, & Thompson, 2018; Wiger et al., 2015; Kugler et al., 2017; McKeever, Jack, & Anderson, 2014; Garcia & Ustymchuk, 2020.

Youth Landscape

Youth entrepreneurship holds a vibrant and diverse landscape, where young individuals actively participate in various income-generating endeavors, spanning urban and rural spheres. From vending fruits to offering services like hairdressing, their resilience shines through amid economic adversities. However, economic restructuring and labor market shifts have shrunk formal employment avenues for youth, amplifying their unemployment rates, exacerbating marginalization concerns, and potentially fostering social unrest (Gough & Langevang, 2017, pp. 1-5). The youth unemployment crisis in these countries exacerbates the issue of BD as young, talented individuals seek employment opportunities elsewhere due to limited prospects at home. This phenomenon further widens the gap in skills and expertise within the local workforce, hindering economic development and innovation.

In response, entrepreneurship emerges as a touted solution, spotlighting youths as potential job creators rather than mere job seekers. Despite this focus, a comprehensive understanding of young entrepreneurs' profiles, challenges, and aspirations remains elusive (Gough & Langevang, 2017, pp. 1-5). Conceptually, youth and entrepreneurship present intricate constructs, with varying interpretations based on age, life stages, and cultural contexts. Entrepreneurship itself has evolved from elite business paradigms to encompass everyday ventures by ordinary individuals, showcasing its dynamic nature intertwined with economic, social, and cultural factors (Gough & Langevang, 2017, pp. 1-5).

Research on African youth entrepreneurship is gaining momentum, shedding light on diverse experiences and challenges, yet studies remain scarce, hindering comprehensive insights (Jeffrey & Dyson, 2013; Gough & Langevang, 2017, pp. 1-5). Accessing sustainable employment remains a hurdle for many youths, underscoring the importance of entrepreneurship training to equip them with the requisite skills. However, social, financial, and cultural constraints pose significant barriers, necessitating holistic approaches (Wiger et al., 2015, pp. 534-535).

Although youth entrepreneurship holds the promise of reducing unemployment, fostering innovation, and stimulating economic development (Ćoćkalo et al., 2017; Manolova et al., 2019), it encounters barriers such as limited access to credit, inadequate education, societal prejudice, and divergent expectations (Sambo, 2016, p. 333). Overcoming these hurdles necessitates initiatives to improve credit availability, enhance the relevance of education, challenge discriminatory attitudes, and align societal perceptions with the aspirations of young people. Such efforts can cultivate a supportive environment for youth entrepreneurship, ensuring its vibrancy (pp. 33-334). Low- to middle-income countries have the opportunity to turn the tide of BD and leverage the potential of their youth to propel economic growth and development by establishing a supportive environment for entrepreneurship and tackling systemic issues.

Research Design and Methodology

This section outlines the systematic approach employed to investigate the relationships between key variables in the context of low-middle-income countries. The statistical approach utilized in this investigation is linear regression, which was selected because all the involved variables are continuous. A continuous variable encompasses an infinite range of possible values within a given range, allowing for fractional or decimal values (Thomas, 2022). Regression analysis is a commonly employed statistical method across various disciplines to comprehend the connections among

variables. In regression, variables are divided into independent and dependent categories. The dependent variable, also referred to as the response variable, is the one being forecasted by the independent variable, known as the predictor variable (Ng et al., 2018, p. 2). Linear regression analysis enables the assessment of both the statistical significance and the practical strength of the relationships between dependent and independent variables (Rosenthal, 2017). This comprehensive analysis is essential for deriving meaningful conclusions from the data.

To conduct this research, different datasets have been merged. This merging process was indispensable as pertinent variables were scattered across separate datasets. Integration was achieved by unifying data from various sources into a cohesive dataset, utilizing a common variable—in this instance, low-middle-income countries—to harmonize the information. Consequently, the final dataset encapsulates all relevant independent, dependent, and control variables.

The independent variable (IV) and one control variable were extracted from the World Bank Database (2020), while the dependent variable (DV) and the other control variable were procured from Ourworldindata (2020). The research focus centers on low- and lower-middle-income countries, prompted by existing literature highlighting the nuanced impacts of BD on these developing nations.

In all cases, 64 low- and lower-middle-income countries were selected based on the classification and ranking provided by the World Bank (2024). The World Bank categorizes economies into distinct income groups according to their Gross National Income (GNI) per capita. As of the fiscal year 2024, low-income economies are those with a GNI per capita of $1,135 or less, while lower-middle-income economies range from $1,136 to $4,465, upper middle-income economies range from $4,466 to $13,845, and high-income economies are those with a GNI per capita of $13,846 or more. This study specifically targets countries falling within the low/lower-middle-income bracket.

All data about these countries are from the year 2020. The decision to focus on these cases was predicated on the extensive availability of data and their representativeness as the most recent dataset accessible for this study

Operationalization

The focus of the independent variable (IV) in this study pertains to education within developing countries, specifically quantified by the percentage of Gross Domestic Product (GDP) allocated to educational initiatives within each nation. This metric, denoted as "share_education_GDP" in our dataset, is crucial in investigating the correlation between educational investment and diverse socioeconomic outcomes within these regions. By scrutinizing the degree to which countries allocate

resources to education concerning their overall economic output, the objective is to enhance comprehension of the influence of educational funding on developmental trajectories, the accumulation of human capital, and broader socioeconomic dynamics within developing contexts. The quantitative assessment of the percentage of GDP designated for educational endeavors makes it feasible to assess the level of commitment and investment in education within each respective country.

The dependent variable (DV) under scrutiny is emigration, represented by the count of individuals leaving their home countries. This data point is designated as "emigration" within the dataset. By focusing on emigration rates, insights into the migratory patterns within developing nations can be gained. This variable is pivotal for discerning the factors influencing individuals' decisions to migrate and understanding the phenomenon of BD.

Two control variables have been added. In the model, the control variable is the proportion of refugees in the total number of emigrants, labeled as "refugees_share_emigration" after recoding. By incorporating this control variable, the objective is to separate and consider the effect of refugee rates on emigration trends specifically within developing nations. The control variable added in the third model is the share of unemployment in the labor force. This additional factor, denoted as "unemployment_share," serves to mitigate the potential confounding effects of unemployment on the relationship between education investment and emigration.

In regression analyses, control variables are integrated to estimate the causal impact of a variable on an outcome (Bernerth et al., 2017, p. 132). Control variables serve as a vital tool for researchers aiming to fulfill one of several criteria for establishing causal inference: the elimination of alternative interpretations for the observed correlation. The rationale behind incorporating control variables into the model is to estimate hypothesized effects while holding the levels of these control variables constant. If the hypothesized relationships remain significant even after accounting for these controls, it becomes possible to dismiss alternative causal explanations involving these control variables (Klarmann & Feurer, 2018, p. 26).

Quality Assessment

The study delves deeply into the issue of BD, emigration, and educational development in developing nations. By thoroughly reviewing existing literature and empirical data, it critically evaluates different viewpoints on BD, spanning from neutral assessments to both pessimistic and optimistic viewpoints. Its external validity lies in its illumination of the multifaceted nature of BD and its repercussions for developing countries, offering valuable insights applicable to policymakers, researchers, and

practitioners in similar contexts. However, its findings' generalizability may hinge on the distinct socio-economic, cultural, and political landscapes of individual nations. Internally, the text maintains logical coherence by presenting a well-structured argument supported by credible evidence. It employs a rigorous analytical methodology, utilizing regression analysis to probe the correlation between educational progress and emigration rates. Yet, while it furnishes valuable insights, it could be enhanced with further methodological elucidation, including a more comprehensive description of variables, criteria for sample selection, and potential limitations of the analyses.

The text adopts a balanced stance by considering diverse perspectives on BD and draws upon a wide array of sources, encompassing academic research and empirical studies. Nevertheless, there is a potential for bias in evidence selection and interpretation, particularly if certain viewpoints are disproportionately represented or if conflicting evidence isn't adequately addressed. While the text draws on empirical research and scholarly studies, the reliability of the information presented may vary depending on the quality of the sources and the robustness of the analyses. The text could benefit from a more transparent and systematic approach to data collection and analysis, including clear documentation of research methods and procedures. This would enhance the reproducibility of the findings and allow for more rigorous scrutiny by other researchers.

Overall, the text serves as a valuable contribution to the academic discourse on BD, entrepreneurship, and education in developing countries. Its comprehensive review of literature, critical analysis of different perspectives, and empirical insights provide a solid foundation for future research in this field.

Research Results and Analysis

This chapter presents the research findings and provides an analysis of the results. It bridges the gap between the theoretical framework and the empirical data collected, aiming to interpret the data in a way that addresses the research questions and hypotheses. The analysis begins with a detailed presentation of the data. An examination of the key trends, patterns, and relationships observed follows this. The findings are then discussed in comparison with existing literature and theoretical models, contextualizing the results within the broader academic discourse. Any anomalies or unexpected results are addressed, providing potential explanations and suggesting areas for further investigation. The chapter aims to interpret research data, showing how findings either support or challenge initial hypotheses, thereby contributing to new knowledge in the field.

Results

The results depicted in Table 1 present the statistical values obtained by the regression. Before conducting the analysis, a thorough assessment was performed to ensure that all assumptions essential for linear regression were met. No deviations were observed, and all criteria were satisfactorily fulfilled (evidence in Appendix A). The association between the independent and dependent variables is further illustrated in Figure 3, which includes a scatterplot depicting the line of best fit. Detailed syntax and output from SPSS are provided in Appendix B.

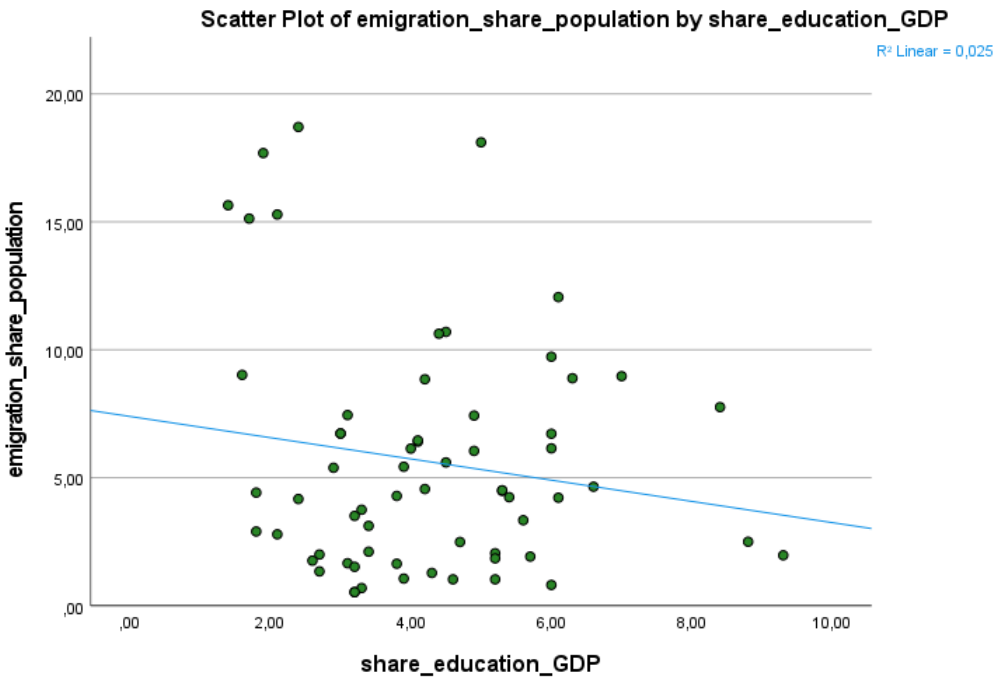
Table 1. Linear regression model of the influence of investment of the GDP on education and emigration

	Model 1	**Model 2**	**Model 3**
(Constant)	7.398	7.289	6.855
	(1.523)***	(1.552)***	(1.570)***
% of GDP invested in education	-0.415	-0.407	-0.570
	(0.332)	(0.335)	(0.352)
% of refugees in the emigrants		0.026	0.031
		(0.056)	(0.056)
% of unemployment in the labor force			0.140
			(0.100)
R^2	0.025	0.028	0.059
Adj. R^2	0.009	-0.004	0.012
N	64	64	64

Note: OLS regression coefficients with standard errors in brackets.

**p<0.10, **p<0.05, ***p<0.001*

Figure 3. Scatterplot of the relationship between the influence of investment of the GDP on education and emigration



Analysis

The study employed linear regression analysis to investigate the potential association between education investment and emigration rates in low- and lower-middle-income countries. Three models were constructed, each incorporating different combinations of the independent variable (education investment) and control variables (proportion of refugees in emigrants and percentage of unemployment in the labor force). Model 1 includes only the pertinent independent variable, while Model 2 and Model 3 incorporate the two control variables. The models aimed to discern whether education investment significantly influenced emigration rates while accounting for potential confounding effects.

In Model 1,. The coefficient associated with the percentage of GDP invested in education is -0.415. This negative coefficient implies that as the percentage of GDP allocated to education increases by 1%, the dependent variable, in this case, the rate of renewable energy, decreases by 0.415 units. However, it is important to note that this relationship is not statistically significant at the conventional significance level of 0.05 ($p = 0.216$). Additionally, Model 1 explains only 2.5% of the variance in the dependent variable, with an adjusted R^2 of 0.025.

In Model 2, similar patterns emerge with slight variations. The coefficient for the percentage of GDP invested in education remains negative (-0.407), indicating a comparable relationship to Model 1, but still lacks statistical significance at the 0.05 level ($p = 0.229$). Additionally, a new

independent variable, the percentage of refugees in emigrants, is introduced with a coefficient of 0.026, which is not statistically significant at the 0.05 level ($p = 0.651$). Model 2 explains a slightly higher percentage of the variance in the dependent variable compared to Model 1, with an adjusted R^2 of 0.028.

Moving to Model 3, adjustments are made to the independent variables. The coefficient for the percentage of GDP invested in education becomes more negative (-0.570) compared to the previous models, although it remains statistically insignificant at the 0.05 level ($p = 0.111$). Similarly, the coefficient for the percentage of refugees in emigrants increases to 0.031 but remains statistically insignificant at the 0.05 level ($p = 0.583$). A new independent variable, the rate of unemployment in the labor force, is introduced with a coefficient of 0.140, which is not statistically significant at the 0.05 level ($p = 0.167$). Model 3 explains a higher proportion of the variance in the dependent variable compared to the previous models, with an adjusted R^2 of 0.059.

Interpretation

The analyses conducted in this study reveal a notable trend towards weak associations between the independent variables and the dependent variable, a phenomenon underscored by the discernibly low R^2 values and the noteworthy absence of statistical significance. Throughout the research endeavor, meticulous attention was directed toward leveraging control variables to meticulously isolate the purported impact of the independent variable on the dependent counterpart. However, regrettably, these control measures failed to yield the anticipated outcomes. Their lack of statistical significance bespeaks their inefficacy in substantially influencing the study's dependent variable. Consequently, it becomes evident that the independent variable under scrutiny emerges as the predominant catalyst driving the observed effects, while the control variables manifest an apparent inability to mediate the relationship between the independent variable and its dependent counterpart. This is further underscored by the meager adjusted R^2 value of 0.059 observed in prior models, indicative of the limited explanatory power conferred by the variables under examination.

It is important to note that the lack of significance in a control variable does not necessarily mean it had no impact on the dependent variable. There could be various reasons for this, such as minor effects that were not captured due to limited sensitivity or a small sample size. Hence, the influence of the control variables may not be entirely clear in this study.

Figure 3 depicts the relationship between the two variables via a scatterplot accompanied by a line of best fit. This line is drawn through the data points to illustrate the trend or pattern present in the data.

The line's downward trajectory suggests a negative correlation between the variables, indicating that an increase in one variable generally corresponds with a decrease in the other. The strength of this relationship can be assessed by observing how closely the data points cluster around the line of best fit. Nevertheless, in this particular study, there seems to be no significant association between the two variables.

Implications

The research endeavor has encountered a noteworthy deviation from the anticipated hypothesis (H1). This outcome underscores a fundamental tenet of statistical inference, contending that, based on the amassed empirical evidence, no discernible effect or relationship manifests between the variables under scrutiny. The study fail to reject the null hypothesis, this underscores the notion that any observed outcomes within the study framework can be attributed to stochastic fluctuations or sampling incongruities rather than indicative of a substantive linkage between the variables. Consequently, the null hypothesis assumes the role of a foundational premise, suggesting the absence of any genuine effect or relationship to be discerned.

However, it is incumbent upon the researcher to recognize that this presumption is not immutable but rather subject to critical scrutiny and evaluation predicated upon the empirical data furnished by the study. In navigating the complexities of statistical inference, researchers are tasked with the responsibility of meticulously assessing the empirical evidence to ascertain whether it aligns with the null hypothesis or provides compelling grounds for its refutation. Thus, while the acceptance of the null hypothesis may seemingly denote a cessation of inquiry, it signals the commencement of a nuanced analysis aimed at unraveling the intricate interplay of variables and elucidating the underlying mechanisms governing the phenomenon under investigation.

The analysis conducted revealed a nuanced perspective on the intricate interplay between education development, various control variables, and the phenomenon of emigration. Despite the meticulous examination, the findings indicated relatively feeble connections among these variables. The absence of statistical significance in the coefficients underscores the possibility that factors beyond the scope of this study might wield more substantial influence over emigration trends.

These results beckon for a deeper exploration into the multifaceted landscape of migration dynamics. It prompts the recognition that there are likely additional elements at play, ones that were not accounted for in the current analysis. These unexplored factors could potentially hold the key to comprehending the complexities underlying migration patterns comprehensively.

Conclusion and Reflection

Despite the hypothesis suggesting a relationship between educational development and increased emigration rates from low-income countries, our statistical analysis using linear regression did not identify a significant correlation between these variables. This finding indicates that efforts to enhance education in these regions may not directly impact emigration rates as initially hypothesized.

The results highlight that, although education is undeniably crucial for various facets of development, such as economic growth and societal progress, it may not be the predominant factor influencing individuals' decisions to emigrate. Instead, other factors—such as economic opportunities, political stability, social conditions, and personal aspirations—likely play more substantial roles in shaping migration patterns. For example, individuals may emigrate in search of better job prospects, higher living standards, or political stability, irrespective of the educational opportunities available in their home country. Economic disparities and limited employment opportunities are particularly strong motivators for migration in low-income regions.

These findings suggest that addressing the challenges of emigration from low-income countries necessitates a multifaceted approach that extends beyond educational development alone. Policymakers and stakeholders must consider a broader range of economic, social, and political factors that influence migration and develop comprehensive strategies to address these issues effectively. While educational development is essential for long-term societal advancement, its direct impact on emigration rates in low-income countries appears to be more nuanced than initially proposed. Further research and a comprehensive understanding of the complex interplay between education and migration dynamics are required to inform evidence-based policymaking and interventions. Such an approach will be crucial in tackling emigration challenges and promoting sustainable development.

Limitations

Acknowledging the inherent limitations of this study is paramount to ensuring the integrity of its findings and recommendations. One notable limitation is the potential presence of omitted variable bias or measurement error within the utilized variables. Despite efforts to encompass a broad spectrum of factors influencing emigration in developing countries, certain variables may have been inadvertently overlooked or inaccurately measured, thereby impacting the robustness of the study's conclusions.

Furthermore, the reliance on linear regression analysis, while a common methodology in empirical research, may not fully capture the complexities of emigration dynamics in developing contexts. Nonlinear relationships or interactions between variables, which are prevalent in migration studies, may not be adequately captured through linear modeling approaches. As such, the findings derived from this study should be interpreted cautiously, recognizing the inherent limitations imposed by the chosen analytical framework.

In conclusion, while this study provides valuable insights into the determinants of emigration in developing countries, it is imperative to recognize its limitations and advocate for continued research efforts aimed at refining our understanding of this complex phenomenon. Consequently, there is a clear call to action for further scholarly inquiry. This warrants a more exhaustive investigation aimed at uncovering these elusive determinants and elucidating their roles in shaping migration dynamics. By delving into these uncharted territories, researchers can aspire to furnish a more comprehensive understanding of the intricate relations around the fostering of education, thereby offering invaluable insights for policymakers, scholars, and practitioners alike.

Future recommendations

The BD crisis presents a major hurdle for numerous developing countries, driven by various factors. With societies and their issues becoming increasingly complex, it is vital to utilize innovative, holistic research approaches that view these problems as interconnected systems rather than isolated components (Biglari et al., 2022). Future studies should adopt a diversified methodological approach, incorporating both quantitative analyses like linear regression and qualitative methodologies such as interviews and case studies. Interdisciplinary collaboration can enrich our understanding of emigration dynamics by integrating insights from diverse disciplines such as economics, sociology, political science, and anthropology (Brettell & Hollifield, 2022). Community engagement is essential for ensuring that research findings are grounded in local realities and contribute to meaningful policy interventions (Collins et al., 2018). By embracing these recommendations, researchers can advance our understanding of migration dynamics and educational development.

Final remarks

This study aimed to investigate the connection between enhancing education and emigration, with a specific focus on BD. We employed a linear regression model to assess the relationship between improved educational opportunities and the tendency for educated individuals to migrate. The findings show no significant correlation between these factors, leading us to accept the null

hypothesis. This implies that enhancing education alone does not directly impact the likelihood of BD.

It is important to recognize that the lack of a significant correlation in the regression model does not mean education does not affect emigration. BD is a complex issue influenced by numerous factors, including economic conditions, political stability, quality of life, career opportunities, and social elements in both the source and destination countries (Ngoma & Ismail, 2013). Although we included control variables in our analysis, there may be unobserved variables and interactions that could influence the results.

Additional research is needed to investigate these complex influences more thoroughly. Longitudinal studies, qualitative research, and the examination of individual country cases could provide deeper insights into how educational advancements interact with other factors affecting emigration. Gaining a better understanding of these dynamics is crucial for policymakers who aim to mitigate BD while fostering educational development.

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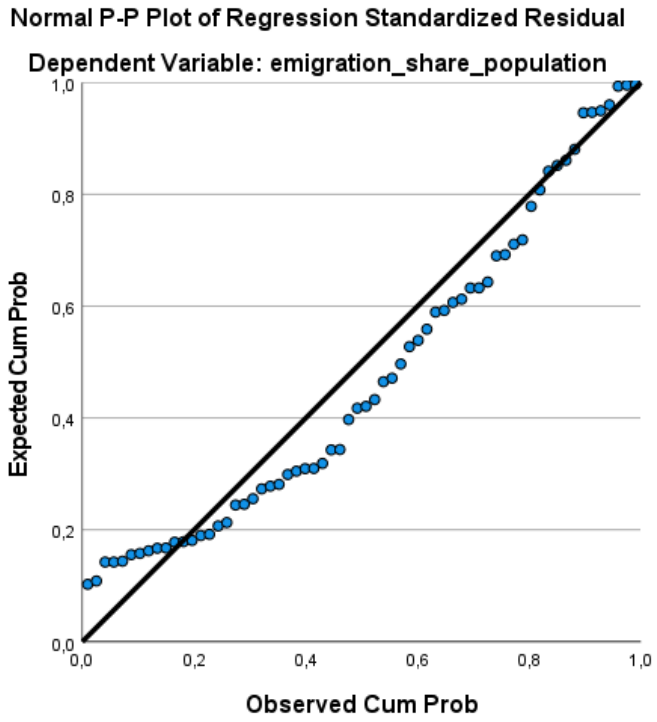
Appendix A. Overview Assumptions Linear Regression

To conduct the linear regression, all the required assumptions have been tested.

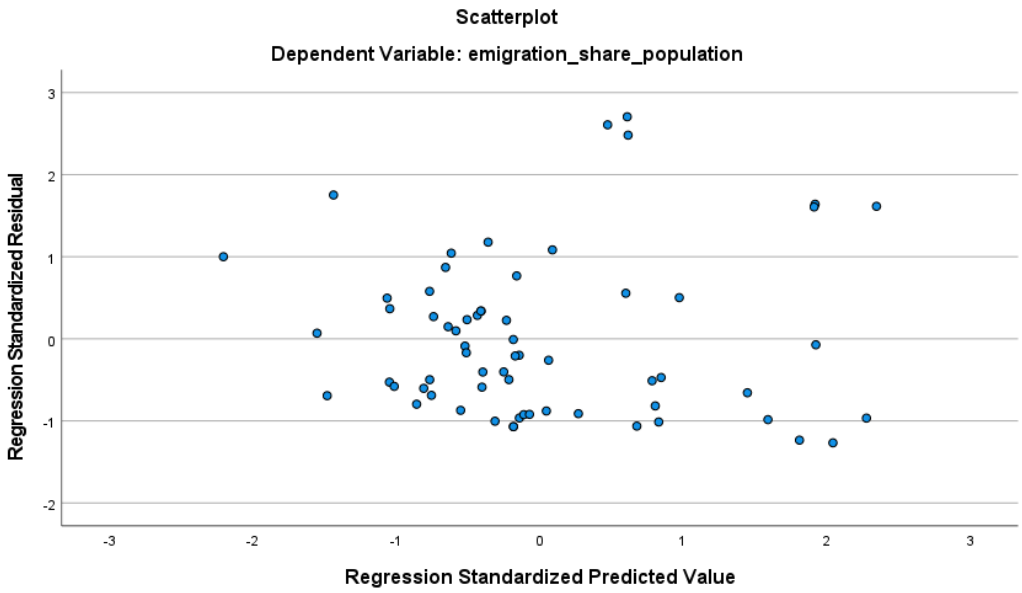
Normality of errors

The normal distribution of regression errors is a fundamental assumption in linear regression. The Normal Probability Plot can indicate whether this assumption has been breached. In the figure below, although the data points do not lie perfectly on the line, they are generally well-distributed. This suggests that the errors conform to the assumption of normality, indicating that this assumption has not been violated.



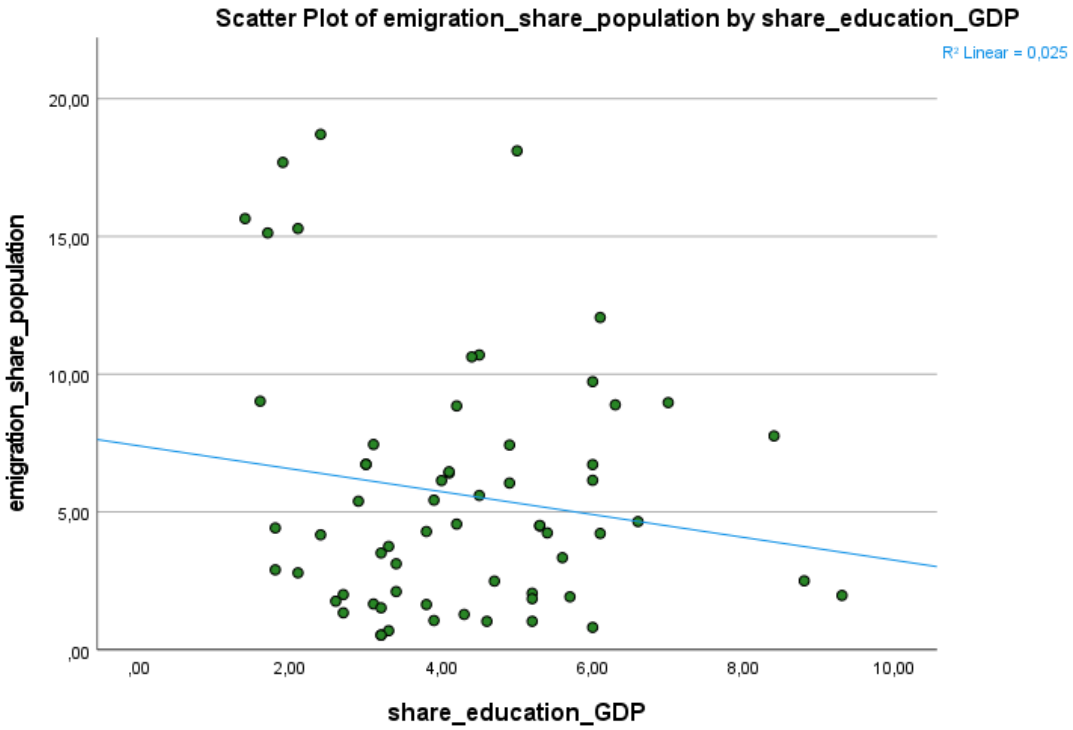
Heteroskedasticity

The heteroskedasticity assumption measures the extent to which observed values deviate from expected values and the uniformity of variance in regression analysis. Heteroskedasticity occurs when the error variance in the dependent variable is inconsistent across all values of the predictor variable. It is typically identified when data points form a funnel shape on a scatterplot. However, the scatterplot below shows that the data points are randomly distributed rather than forming a funnel shape, indicating that the assumption of homoskedasticity is not violated.



Linearity

According to this assumption, the relationship between the independent and dependent variables is linear. In this research, there is little/no relationship between the independent variable (share of GDP invested in education) and the dependent variable (share of emigrant of the whole population). This is evidenced by the linear regression slope, which has a value of 0.025.



Outliers

By examining the absolute values of the standardized residuals (or prediction errors) from the model, we can determine if there are any issues with outliers. We would be particularly concerned if any case has a |standardized residual| > 3.29, if more than 1% of cases have a |standardized residual| > 2.58, or if more than 5% of cases have a |standardized residual| > 1.96. According to the frequency tables presented below, none of the instances exceed the first criterion, only 2 instances exceed the second criterion, and 3 instances exceed the final criterion. Therefore, there is no reason to believe that the model has an issue with outliers.

Statistics

		|Std. Residuals| > 3.29	|Std. Residuals| > 2.58	|Std. Residuals| > 1.96
N	Valid	64	64	64
	Missing	0	0	0

|Std. Residuals| > 3.29

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	,00	64	100,0	100,0	100,0

|Std. Residuals| > 2.58

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	,00	62	96,9	96,9	96,9
	1,00	2	3,1	3,1	100,0
	Total	64	100,0	100,0	

|Std. Residuals| > 1.96

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	,00	61	95,3	95,3	95,3
	1,00	3	4,7	4,7	100,0
	Total	64	100,0	100,0	

For Cook's distance, a case is considered influential if its value exceeds 1. To determine if any cases meet this criterion, we first examine the Residuals Statistics output box to see if the maximum

Cook’s Distance is greater than 1; none of the cases exceed this threshold. Additionally, by creating a binary variable from the saved Cook's Distance values, we can verify that no cases have a value greater than 1. Both methods confirm that there are no influential cases based on Cook’s Distance.

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3,1743	8,2520	5,6345	1,11531	64
Std. Predicted Value	-2,206	2,347	,000	1,000	64
Standard Error of Predicted Value	,594	3,123	1,038	,489	64
Adjusted Predicted Value	2,5588	10,7714	5,6635	1,27294	64
Residual	-5,80322	12,39615	,00000	4,47119	64
Std. Residual	-1,267	2,706	,000	,976	64
Stud. Residual	-1,349	2,754	-,003	1,012	64
Deleted Residual	-7,02138	12,84320	-,02893	4,82184	64
Stud. Deleted Residual	-1,359	2,922	,007	1,034	64
Mahal. Distance	,076	28,279	2,953	4,831	64
Cook's Distance	,000	,245	,021	,044	64
Centered Leverage Value	,001	,449	,047	,077	64

a. Dependent Variable: emigration_share_population

Cook'sDistance > 1?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	,00	64	100,0	100,0	100,0

Autocorrelation/Independent errors

This assumption is verified by the Durbin-Watson statistic, which evaluates the presence and direction of autocorrelation in a statistical model. This measurement ranges from 0 to 4, with a value of 2 indicating no autocorrelation. Values less than 2 suggest positive autocorrelation, while values greater than 2 indicate negative autocorrelation. The Durbin-Watson value for this regression is 1.597, indicating that there is no violation of the autocorrelation assumption.

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	,157[a]	,025	,009	4,58779	,025	1,562	1	62	,216	
2	,167[b]	,028	-,004	4,61743	,003	,207	1	61	,651	
3	,242[c]	,059	,012	4,58161	,031	1,958	1	60	,167	1,597

a. Predictors: (Constant), share_education_GDP

b. Predictors: (Constant), share_education_GDP, refugees

c. Predictors: (Constant), share_education_GDP, refugees, unemployment_share_labour

d. Dependent Variable: emigration_share_population

Multicollinearity

The Tolerance and VIF tests can determine whether the multicollinearity assumption has been violated. For the regression analysis, Tolerance values should be over 0.2, and VIF values should be below 5 to avoid multicollinearity. The coefficients table shows that all Tolerance values are above 0.2, and all VIF values are below 5. Therefore, multicollinearity is not an issue in this regression analysis.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	7,398	1,523		4,857	<,001	4,353	10,443					
	share_education_GDP	-,415	,332	-,157	-1,250	,216	-1,079	,249	-,157	-,157	-,157	1,000	1,000
2	(Constant)	7,289	1,552		4,698	<,001	4,186	10,392					
	share_education_GDP	-,407	,335	-,153	-1,214	,229	-1,076	,263	-,157	-,154	-,153	,997	1,003
	refugees	,026	,056	,057	,455	,651	-,087	,139	,066	,058	,057	,997	1,003
3	(Constant)	6,855	1,570		4,365	<,001	3,714	9,996					
	share_education_GDP	-,570	,352	-,215	-1,618	,111	-1,275	,135	-,157	-,204	-,203	,887	1,127
	refugees	,031	,056	,069	,552	,583	-,081	,143	,066	,071	,069	,992	1,008
	unemployment_share_labour	,140	,100	,186	1,399	,167	-,060	,340	,109	,178	,175	,884	1,131

a. Dependent Variable: emigration_share_population

Appendix B. Relevant SPSS Output and Syntax

Regression syntax and output

```
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) BCOV R ANOVA COLLIN TOL CHANGE ZPP
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT emigration_share_population
  /METHOD=ENTER share_education_GDP
  /METHOD=ENTER refugees
  /METHOD=ENTER unemployment_share_labour
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS DURBIN HISTOGRAM(ZRESID) NORMPROB(ZRESID)
  /CASEWISE PLOT(ZRESID) OUTLIERS(3)
  /save resid zresid sresid pred adjpred cook sdbeta.
```

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	7,398	1,523		4,857	<,001	4,353	10,443					
	share_education_GDP	-,415	,332	-,157	-1,250	,216	-1,079	,249	-,157	-,157	-,157	1,000	1,000
2	(Constant)	7,289	1,552		4,698	<,001	4,186	10,392					
	share_education_GDP	-,407	,335	-,153	-1,214	,229	-1,076	,263	-,157	-,154	-,153	,997	1,003
	refugees	,026	,056	,057	,455	,651	-,087	,139	,066	,058	,057	,997	1,003
3	(Constant)	6,855	1,570		4,365	<,001	3,714	9,996					
	share_education_GDP	-,570	,352	-,215	-1,618	,111	-1,275	,135	-,157	-,204	-,203	,887	1,127
	refugees	,031	,056	,069	,552	,583	-,081	,143	,066	,071	,069	,992	1,008
	unemployment_share_labour	,140	,100	,186	1,399	,167	-,060	,340	,109	,178	,175	,884	1,131

a. Dependent Variable: emigration_share_population

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	,157[a]	,025	,009	4,58779	,025	1,562	1	62	,216	
2	,167[b]	,028	-,004	4,61743	,003	,207	1	61	,651	
3	,242[c]	,059	,012	4,58161	,031	1,958	1	60	,167	1,597

a. Predictors: (Constant), share_education_GDP

b. Predictors: (Constant), share_education_GDP, refugees

c. Predictors: (Constant), share_education_GDP, refugees, unemployment_share_labour

d. Dependent Variable: emigration_share_population

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	share_education_GDP	refugees	unemployment_share_labour
1	1	1,926	1,000	,04	,04		
	2	,074	5,117	,96	,96		
2	1	2,041	1,000	,03	,03	,05	
	2	,886	1,518	,01	,01	,94	
	3	,073	5,301	,96	,96	,01	
3	1	2,770	1,000	,02	,02	,01	,03
	2	,926	1,730	,00	,00	,95	,01
	3	,232	3,455	,11	,07	,03	,94
	4	,072	6,198	,87	,91	,01	,01

a. Dependent Variable: emigration_share_population

Graph Figure 1 syntax

```
* Chart Builder.
GGRAPH
  /GRAPHDATASET NAME="graphdataset" VARIABLES=share_education_GDP
emigration_share_population
    MISSING=LISTWISE REPORTMISSING=NO
  /GRAPHSPEC SOURCE=INLINE
  /FITLINE TOTAL=YES SUBGROUP=NO
```

```
  /COLORCYCLE COLOR1(41,134,38), COLOR2(95,195,56), COLOR3(92,202,136),
COLOR4(95,195,56),
    COLOR5(95,195,56), COLOR6(25,128,56), COLOR7(0,45,156), COLOR8(238,83,139),
COLOR9(178,134,0),
    COLOR10(0,157,154), COLOR11(1,39,73), COLOR12(138,56,0), COLOR13(165,110,255),
    COLOR14(236,230,208), COLOR15(69,70,71), COLOR16(92,202,136), COLOR17(208,83,52),
    COLOR18(204,127,228), COLOR19(225,188,29), COLOR20(237,75,75), COLOR21(28,205,205),
    COLOR22(92,113,72), COLOR23(225,139,14), COLOR24(9,38,114), COLOR25(90,100,94),
COLOR26(155,0,0),
    COLOR27(207,172,227), COLOR28(150,145,145), COLOR29(63,235,124), COLOR30(105,41,196)
  /FRAME OUTER=NO INNER=NO
  /GRIDLINES XAXIS=NO YAXIS=YES
  /STYLE GRADIENT=NO.
BEGIN GPL
  SOURCE: s=userSource(id("graphdataset"))
  DATA: share_education_GDP=col(source(s), name("share_education_GDP"))
  DATA: emigration_share_population=col(source(s), name("emigration_share_population"))
  GUIDE: axis(dim(1), label("share_education_GDP"))
  GUIDE: axis(dim(2), label("emigration_share_population"))
  GUIDE: text.title(label("Scatter Plot of emigration_share_population by
share_education_GDP"))
  ELEMENT: point(position(share_education_GDP*emigration_share_population))
END GPL.
```

Outliers and Cook's distance syntax

```
recode ZRE_1 (SYSMIS = SYSMIS) (-3.29 thru 3.29 = 0) (else = 1) into resid_329.
recode ZRE_1 (SYSMIS = SYSMIS) (-2.58 thru 2.58 = 0) (else = 1) into resid_258.
recode ZRE_1 (SYSMIS = SYSMIS) (-1.96 thru 1.96 = 0) (else = 1) into resid_196.

variable labels resid_329 "|Std. Residuals| > 3.29".
variable labels resid_258 "|Std. Residuals| > 2.58".
variable labels resid_196 "|Std. Residuals| > 1.96".
execute.
frequencies resid_329 to resid_196.

recode COO_1 (SYSMIS=SYSMIS) (1 thru highest = 1) (else = 0) into cook.
variable labels cook "Cook'sDistance > 1?".
execute.
```