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# Critical review of the use of financial incentives in solving health professionals' brain drain

 Adetola A. Akinto



Department of Business Administration, Faculty of Management, Nile University of Nigeria, Abuja, Nigeria

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### ABSTRACT

*This study critically reviewed the use of financial incentives in solving health professionals' brain drain, with the view to ascertain its effectiveness. The Systematic Assessment Quantitative Technique (SQAT) developed by Catherine Pickering and Jason Antony Byrne, was used to identify and review 21 relevant peer-reviewed journal articles that investigated six forms of financial incentives in solving health professionals' brain drain. Evidence from 66.67% of the studies showed that financial incentives are effective in solving health professionals' brain drain through the use of improved remuneration, funded training, return subsidy and research grant. The remaining part of the studies (33.33%) did not find the use of financial health aid and bonding effective. This study recognized that financial incentives do not fully solve healthcare brain drain and other non-financial measures need to be implemented; future research work should therefore integrate other measures with financial incentives in order to gain additional insight on solving healthcare brain drain. The use of limited but high-quality academic databases means that some articles were not considered for review.*

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## Introduction

Globalisation has made the labour market more dynamic and facilitated the migration of people (Trenz & Triandafyllidou, 2017; Bakker et al., 2017; Gerhards et al., 2017, Svazas & Liberyte, 2019). The International Labour Organisation (ILO) estimates that there are 164 million migrant workers worldwide and they constitute 18.5 per cent of the workforce of high-income countries; with a significant number of them being highly skilled educated professionals. (Bălan, & Olteanu, 2017; International Labour Organisation [ILO], 2018). The recent rise in the number of high skilled migrants to Canada further proves how globalization has made labour migration much easier (Edmond, 2017; Organization for Economic Cooperation and Development [OECD], 2019; Hagan, 2020).

Technologically advanced countries often require highly skilled workforce which the country's population cannot fill (Sharma et al., 2017; McGrath & Behan, 2017; Grigoleit-Richter, 2017). In order to meet this labour deficit, policies and immigration laws of these developed countries are relaxed and aimed at attracting high-skilled workers mostly from labour rich poorer countries (Czaika & Parsons, 2017; Kwon, 2018; Edwards, 2019). On the other hand, educated skilled graduates are also attracted to the industrialized and mechanized developed countries because of their relative economic prosperity, incentives, scholarships, better living standard, better job opportunities, political stability and state welfare (Razin, 2017; Ozel et al., 2017; Kattel & Sapkota, 2018). This migration negatively impact the community from which they migrate as they transfer their competencies to another country leaving a shortfall in skilled labour behind (Donoso & Mancilla, 2017; Svazas & Liberyte, 2019; Schoenfeld, 2019). This phenomenon is referred to as 'Brain Drain' (Xu, & Sylwester, 2017; Laila & Fiaz, 2018; Ullah, 2018).

Brain drain is when a country loses its talented, skilled and highly educated people to another country through migration; mostly from developing countries to developed countries (Yieng et al., 2017; Fong & Hassan, 2017; Nechad, 2018). This often leads to

\* Corresponding author. ORCID ID:

serious skilled manpower scarcity that makes it difficult for some developing countries to provide the basic needs of its citizenry (Hobden, 2017; Thapa & Shrestha, 2017; Uprety, 2019).

Although there is a general brain drain of scientists, doctors, academics, engineers and IT specialists due to the increasing migration of these professionals to developed countries (Ullah, 2018; Laila & Fiaz, 2018; Anokye et al., 2019). However, this paper is focused on the brain drain of health professionals as study shows that the estimated 4.3 million shortfall of healthcare professionals worldwide has increased the demand for doctors and nurses by the richer nations (Brock & Blake, 2017; Mlambo & Adetiba, 2017; Jack, 2019); and many studies have found that mortality is threatened, and health outcomes decline when health professionals leave the country (Donoso & Mancilla, 2017; Yuksekdag, 2018; Uprety, 2019). The effective functioning of any health sector is highly dependent on the availability of skilled health professionals, losing these professionals will ultimately weaken the socio economic development of its country; hence the need to find ways of limiting their migration (Donoso & Mancilla, 2017; Okeja, 2017; Mlambo & Adetiba, 2017). While dealing with this requires a carefully tailored strategy, temporary restriction on the emigration of health workers has been a major recommendation (Ilić & Milosavljević, 2017; Cole, 2017; Donoso & Mancilla, 2017; Yuksekdag, 2018). Policy recommendations have also been made, like the global code of practice on the international recruitment of health personnel issued by the World Health Organization (WHO) in 2010, that directs all member states to respect the rights and needs of source countries in international migration of health personnel in order to mitigate the negative effects of health personnel migration on the health systems of developing countries; but there is little evidence that the implementation of the code has been successful or effective (Brouillette et al., 2017; Yeates, & Pillinger, 2018; Shaffer et al., 2018). However, since higher income and financial factors have been suggested by literature as the most important motivations for migration followed by economic sustainability, better working conditions, more job satisfaction and the quality of management (Thapa & Shrestha, 2017; da Costa et al., 2017; Goštautaitė et al., 2018; Najib et al., 2019); financial incentives such as increased wages, grants, tax waivers, return subsidy have been recommended as most appropriate in retaining health workers (Hutch et al., 2017; Aida, 2017; Aarhus & Jakobsen, 2019). It is therefore pragmatic that research be carried out to determine whether the use of financial incentives has been effective in solving health professionals' brain drain. To achieve this important objective, this study therefore reviews empirical journal articles that have sought to investigate the effectiveness of various financial incentive strategies in stemming the migration of healthcare professionals from developing countries to developed countries. Articles for the review were sourced from twelve databases; Elsevier; Emerald, Sage, Springer; Taylor and Francis; Wiley; Oxford; Cambridge Journal; MIT; Ingenta; Inderscience and HeinOnline. These databases are known to publish peer reviewed articles which are believed to be of high quality (Sidalak et al., 2017; Yarris et al., 2017; Caputo, 2019). This study is time bound as it aims to focus on recent developments in this area, hence it uses articles published between 2010 and 2019.

The next section is the methodology section which discusses the method and procedures used in conducting this critical review. This is followed by a section that discusses the findings, and results to the central research question is also provided. This is followed by the recommendations section, and then the conclusion section where limitations of the study are presented as gaps for future research.

## Research and Methodology

### A critical analysis with systematic quantitative assessment (SQAT) technique

This study adopted the “systematic quantitative assessment technique” (SQAT) developed by Pickering and Byrne (2013). SQAT is systematic in the way papers are assessed to determine their inclusion or exclusion in the review process, and the focus is on peer-reviewed original journal publications so as to maintain a high quality of articles (Pickering & Byrne, 2013). SQAT recommends five important steps in conducting an effective review. Each step and how it was applied in this study is described in Table 1. A total of twenty-one peer-reviewed English articles met the selection criteria from twelve databases. Table 2 presents the number of articles downloaded from each database utilized.

**Table 1:** Description and application of SQAT

Step	Application in current study
1. Define topic	Use of Financial Incentives in solving Health professionals' brain drain.
2. Formulate research questions	One research question: “How effective have financial incentives been in solving Health professionals' brain drain?”
3. Identify key words	“Brain Drain”, “Health Workers Migration”, “Medical Brain Drain”, “Financial Incentives”
4. Identify and search databases	1. 12 databases utilized: Elsevier; Emerald, Sage, Springer; Taylor and Francis; Wiley; Oxford; Cambridge Journal; MIT; Ingenta; Inderscience; HeinOnline. 2. “All in title” search using three search combinations: a. “Brain Drain” b. “Financial Incentives” + “Health Professional” c. “Medical Migration”
5. Read and assess publications	1. Abstracts of papers found were read to ensure that they were dealing with financial incentives as health professionals' brain drain plug. 2. Literature review, book chapters, conference proceedings were not included; only peer-reviewed conceptual and empirical papers.

**Table 2:** Number of Papers downloaded in databases

	<b>Database</b>	<b>Number of Papers</b>
<b>1</b>	Elsevier	8
<b>2</b>	Springer	4
<b>3</b>	Sage	3
<b>4</b>	Cambridge Journal	2
<b>5</b>	Taylor & Francis	2
<b>6</b>	Wiley	1
<b>7</b>	Emerald	1
<b>8</b>	Oxford	0
<b>9</b>	Inderscience	0
<b>10</b>	Ingenta	0
<b>11</b>	MIT	0
<b>12</b>	HeinOnline	0

## Analysis

The downloaded journal articles were reviewed to establish the various types of financial incentives that have been adopted, the methodologies used to collect data, and the analyses used to determine their effectiveness in reducing healthcare brain drain in developing countries.

The studies obtained data through Survey/Questionnaires (4), Interview (1), Content Analysis (9) and Case Study (7). The data sample covered 2007 to 2015 from Asia (Pakistan, UAE, Thailand and Shanghai); Europe (Romania, Greece, Ireland and Portugal); Africa (Egypt, Kenya and Sierra Leone) and North America (Missouri and California in the USA).

Panel data were also utilized and covered 142 developing and transitional countries between 1990 and 2010; 192 countries between 1991 and 2004; and eight East, Central and Southern Africa countries of Ethiopia, Malawi, Zimbabwe, Kenya, Rwanda, Zambia, Uganda and Tanzania between 1974 and 2013. Sixteen of the results obtained from these were analyzed mainly through descriptive/explanatory method while others were with the use of SPSS 19 and regression analysis (regression discontinuity analysis, logistic regression model, regression analysis and two-way fixed effect regression estimator). The results and findings were critically examined to determine if financial incentives have been effective in solving health professionals' brain drain.

## Findings

This section provides an overview of the empirical evidences on the use of financial incentive in solving health professionals' brain drain, the different methods, their benefits, and challenges in order to gain a comprehensive outlook on the effectiveness of financial incentive in solving health professionals' brain drain.

Six types of financial incentives were identified from the downloaded journal articles: Improved Remuneration, Funded Training, Bonding, Foreign Health Assistance, Return Subsidy and Research Grant. Empirical evidences will be presented for each of these identified incentives in order to determine their effectiveness in reducing healthcare brain drain.

### Improved Remuneration

Increase in salary and allowances were identified in eight studies as incentives that can provide immediate results in retention of health workers. Findings from only three of the studies show that improved remuneration to health workers has been effective in reducing healthcare brain drain in the countries and communities they were implemented.

Using a two-way fixed effects regression analysis to test the relationship between economic freedom and brain drain across 142 developing countries, results showed that an increase in economic freedom is strongly related to lower levels of brain drain; this economic freedom arises from increasing income in the medium to long term (Aarhus & Jakobsen, 2019). A descriptive analysis of the data obtained from African countries revealed that positive result on the use of financial incentives have been observed in some Africa countries. In a bid to improve the retention of nurses, Botswana introduced generous overtime allowances of up to 30% of salaries, part time employment, flexible time and housing; and Zambia also doubled nurses' salaries in 2001. Malawi in 2004 received a \$278 million funding from donors that enabled financial and other incentives to boost recruitment and retention of health workers through salary increases, improved staff housing etc This paid off as the number of registered nurses leaving Malawi fell from a high 111 in 2001 to just six in the first half of 2008, the enrolment at nursing school also doubled (Kalipeni et al., 2012).

To solve the problem of brain, drain in rural communities, in 2004, the health care personnel in the relevant communities of Pudong area in Shangai were given monthly bonuses. Descriptive analysis of institutional survey carried out on the strategy revealed that

the overall rate of health brain drain decreased from 8.1%(568/996) in 2013 to 4.6%(302/6553) in 2015, moreover in places where highest bonuses were offered(rural), rate of decline were smaller than areas where no bonuses were offered(urban)(Liu et al., 2016).

Improved salary is not always an effective tool for retaining healthcare professional as revealed in the analysis of the responses to the questionnaires sent out to 90 Romanian physicians with international experience. Out of twelve of the medical doctors who already returned home only one mentioned that beside family reason, his decision was based on a good salary offered. Others argued that their decision is based on personal reasons (family reason), patriotism and the desire of contributing to the change of the Romanian medical sector. (Boncea, 2015). In 2014, questionnaires were used to assess the possible retention of 503 Portuguese junior doctors; findings from the logistic regression analysis of the result revealed that although income was considered a factor, the key role of non-monetary factors like research opportunities was emphasized on more (Ramos & Alves, 2017). A 2010 study of the strategy by the Sierra Leone government to overcome brain drain through increase of all employee salary by 10% was still found to be unsatisfactory by the health workers; in addition to higher salaries and better working conditions, the health professionals want more postgraduate training opportunities (Kelly & Barrie, 2010). Due to the economic recession Greece is experiencing, improved salaries were found not to be an effective tool in addressing brain drain (Ifanti et al., 2014).

### **Funded Training**

Educational funding by government or donor agencies through scholarships or specialized training were identified as a form of financial incentive in five studies. Although this strategy might not have completely resolved healthcare brain drain, but the studies show that it has been very effective in minimizing it.

Expansion of national surgical training initiatives has proved to be an effective solution to addressing the surgical workforce brain drain in East, Central and Southern Africa. A 2016 descriptive assessment of data obtained on 1038 surgical graduates of 15 institutions covered by the College Of Surgeons Of East, Central And Southern Africa (COSECESA), and comparing against database of medical council and surgical society records showed that 85.1% were retained in the country they trained in, while 88.3% were retained within the COSECESA region and ninety-three per cent (93.4%) were retained within Africa (Hutch et al., 2017). In the same way, a University of California Los Angeles international medical graduates family medicine scholarship training program developed to address the dearth of diversity of physicians to meet the needs of California's Hispanic communities has helped placed 54 program graduates in family medicine residency and to eventually practice in underserved communities(Dowling & Bholat, 2012).

There is available evidence that highly targeted state-funded merit-based financial aid program has had a positive impact in retaining high quality human capital in Missouri State. In order to examine the impact of a Missouri's Bright Flight Scholarship program, administrative datasets were obtained from ACT Inc., the Missouri Department of Higher Education and the Missouri Department of Labour and Industrial Relations (DOLIR). The data contained 154, 888 individual student records which when analyzed with the regression discontinuation analysis approach revealed that 52% of the analytical sample were employed within Missouri, an increase of 9% (Harrington et al., 2016).

Furthermore, an explanatory review of a case study on the increasing number of Egyptian physicians migrating to the UK which has led to a decline in the number of available psychiatrists was carried out. To address this decline, the Mental Health network (Mehehet) project which is an Egyptian-Italian initiative implemented between 2010 and 2012, and international collaborative REMEDY project, 2013–2015 were involved in the training of physicians, nurses and health visitors working in primary care. This was not only effective in the setting up of the first community mental health center in Egypt but allowed the trained primary care physicians to detect the onset of mental health disorders and to refer cases to the local community mental health centers (Loza & Sorour, 2016). Also, as a measure to expand and reduce brain drain of psychiatric nurses and psychiatrists, the Kenyan government through collaborative effort provided supportive continuing professional development for over 2000 mental health personnel between 2005 and 2010. A pragmatic clustered randomized controlled trial/survey by the University of Nairobi and Great Lakes University, which was funded by the UK Department for International Development, demonstrated that the clients of trained health workers had better health, social and quality-of-life outcomes than clients of untrained health workers (Brownie & Oywer, 2016).

### **Return Subsidy**

Four studies reviewed by the researcher indicated that healthcare brain drain could be considerably reversed by encouraging the return of these professionals through provision of settlement allowance, compensation, financing their return, and even paying the same wages that they would earn abroad. Results have shown that return subsidy is effective in addressing brain drain, however, it is minimal. The researcher also believes that a cost-benefit analysis of this strategy along with consideration of the effect of asymmetric information need to be carried out before implementation.

Using interview a method of obtaining data, a robust qualitative research that is aimed at a clear description of individual experience was carried out on 42 repatriates in the United Arab Emirates (UAE). Results showed that 10 out of 42 interviewees returned home voluntarily with the help of government through job offers, financial support, high appealing research grants and generous support in terms of relocation expenses (shipping, wrapping up, contribution to settling in etc). Eight further indicated that financial incentives would have encouraged made them to relocate earlier (Forstenlechner, 2010). With China as case study, Dai et al. (2015) disclosed that China suffered extensively from the brain drain problem in the past several decades, with few students choosing to return to China. However, this pattern started to change after the Chinese government's recent implementation of a series of subsidy policies

to lure their overseas talent home. The government provides better compensation packages in order to attract those who return with some international work experience, whereas those who return immediately after their studies enjoy only a basic allowance. Although on the one hand, it can indeed attract more returnees but the research shows that the effect of asymmetric information will not make it attract the best quality.

A descriptive analysis of statistics obtained from the destination countries (Germany, UK, France, Sweden and Iceland), statistics on permanent migration obtained from National Institute of Statistics and primary data obtained from questionnaires delivered to doctors with international experience at Romanian College of Physicians (2008 -2013) was carried out to ascertain the migration/return intention of Romanian Medical Doctors. The 42.55% increase in the number of physicians that emigrated in 2011 was considered to be a consequence of the 25% salary cuts of 2010. 3.7% of the 90 respondents do not intend to return, 8.9% intent to return and 40% are undecided. The undecided are mainly in the age category 25-34 who still need to acquire necessary knowledge and experience. The potential of turning this around is dependent on the ability to offer them incentives for returning (Boncea, 2015). A study by Hussain, (2015) in Pakistan analyzed the effect of return migration on the microeconomic performance of a developing country. He opined that the government of a country should finance the return migration of its skilled nationals working abroad by paying them the same wages that they would earn abroad.

### **Research Funding**

From two studies, funding of medical research and providing infrastructural incentives to health professionals is effective in addressing health care brain drain.

A study to examine the importance of personal, professional and infrastructural factors on surgeons' migration from Low and Medium Income Countries (LIMC) to the USA, utilized descriptive analysis on an internet based survey questionnaire administered to US surgeons who were born, who grew up, and attended medical school in LIMC. Results from the 60 respondents showed that that improved specialist education, and surgical infrastructure have potential to promote retention of surgical workforce in the LIMC (Haganer et al., 2012).

Research funding has been found to be very effective as Thailand and Ireland are two nations, who through forward thinking leadership and a commitment to improve domestic conditions have succeeded in reversing brain drain by offering generous research funding and monetary incentives, as well as services and assistance to their health care work force (Grenier, 2015).

### **Bonding**

Bonding is another strategy aimed at encouraging the return of migrants. In most African countries, students sent abroad for training are contractually bound to government service after return, but this is often ineffective because it is poorly enforced (Marchal, 2014). Eritrea, in a descriptive analysis of the data obtained from African countries made students going to South Africa to post a \$15,000 bond to ensure their return. While in Ghana, all health care personnel trained at government expense are bonded for three to five years or else refund training costs if they abscond in order to render immigration less attractive; the Nurses and Midwives Council also instituted a policy that restrains nurses from obtaining verification of their certificates until they have worked for at least two years within the country. However Bonding has generally failed in Ghana due to poor compliance and corruption (Kalipeni et al., 2012). Evidence suggests that most restrictive policies like bonding are rarely effective in stemming the brain drain (Adepoju et al., 2010).

### **Foreign health assistance**

This can be divided into two categories: financial health aid and technical assistance (or human capital aid). Financial health aid includes all funds in the health sector given to a particular developing country in the form of monetary flows. A study that shows using it alone to curb health care brain drain is ineffective was carried out. The Data covered emigration from 192 source countries to 17 destination countries from 1991 to 2004. 87.5 % of the data was collected from medical association of the destination countries and 12.5% from medical associations of source countries (country of birth or nationality). Data on health aid was extracted from Country Reporting System (CRS) database as compiled by development Assistant Committee (DAC) of OECD. A system of Generalised Method of Moments (GMM) model was applied to address and control endogenous variables. Descriptive analysis showed that foreign health assistance could limit the emigration of doctors to some degree but this effect operates through technical assistance rather than financial flows; possibly because monetary funds from foreign health aid may be diverted for other purposes unlike technical assistance which is a direct contribution to the health system (Moullan, 2013). Foreign financial aid alone is not effective in reducing brain drain, other economic policies need to be implemented along with it.

### **Effectiveness of financial Incentives**

An action is said to be effective if it produces desired or intended result; this study has made use of this interpretation to assess the effectiveness of financial incentives in addressing health professionals' brain drain. The 21 journal articles reviewed focused on different aspects of financial incentives; evidences from fourteen of those articles categorically suggest that financial incentives are effective in stemming healthcare brain drain. This represents 66.67% of the studies, use of financial incentives can then be deemed effective in solving health professionals' brain drain.

Foreign financial health aid and Bonding were considered not effective in solving brain drain due to poor compliance, diversion of funds and corruption (Kalipeni et al., 2012; Moullan, 2013). Three studies out of the 8 on improved remuneration found increased salary and allowances as effective tools while the other 5 were of the opinion that improved remuneration alone is not sufficient to solve brain drain as the key roles of career and family in the decision to repatriate remain crucial. However, this study has shown that funded training, return subsidy, research funding and improved remuneration have been utilized successfully in various regions of the world: Africa, Asia, USA and Europe. The impact of these measures might seem negligible in the face of the magnitude of brain drain and health personnel shortage, but their use have proved effective for desired results in the countries and communities they were utilized.

### Challenges

The effective use of financial incentives in solving health professionals' brain drain involves enormous resources. In view of the economic status of most of the affected countries, the sustainability of these gains is uncertain; and the ability of these resource-poor countries to continue to invest in this strategy is limited (Mackey & Liang, 2013). Lack of adequate data to measure brain drain and monitor the effectiveness of the incentives also poses as a challenge (Capuano & Marfouk, 2013). This strategy involves financial benefit which is easily abused, making corruption another major challenge in its implementation and success (Dimant & Tosato, 2018).

### Conclusion

Global health professional shortage has led to their high demand, health professionals are now increasingly migrating to rich developed countries that offer higher remuneration, better living condition, infrastructure, career progression and stability; this has left developing countries with higher burden of disease with fewer health professionals to attend to it.

Having realized that one of the major reason for migration is financial, this paper focused on how effective financial incentives have been in solving health professionals' brain drain. Various forms of financial incentives were identified and findings show that improved remuneration, funded training, return subsidy and research grant have been utilized successfully in various regions of the world; while financial health aid and Bonding were considered rarely effective. This study recognizes the fact that financial incentives does not fully solve brain drain problem but that it plays a major role, and other non-financial measures need to be implemented.

The researcher had limited number of peer-reviewed journal articles that addressed the use of financial Incentives in solving health professionals' brain drain. It is therefore proposed that financial incentives should be integrated with other measures for future research work as migration of skilled workers and its resultant brain drain effect is increasingly rising and need to be stemmed.

*This study recommends that;*

- i. *Health professionals often require more than financial incentives to be retained, as they often push for other factors like better working conditions, adequate health equipment, career developments or specializations, hence state authorities have to consider implementation of other sets of adequate measures both to reduce brain drain and stimulate return.*
- ii. *In order to meet the challenges of limited resource in making financial incentives available, collaboration with external donors may be necessary; along with integration of effort from both private and public health sectors.*
- iii. *Haphazard use of different forms of incentives will not yield expected result and ultimately lead to loss of resources; incentives should therefore be designed based on the specific needs of the health system of the country/community.*
- iv. *Strategies for collection, analysis and storage of data on healthcare brain drain need to be put in place. This will aid planning and monitoring of policies, and makes statistical data available for research.*

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