USING FACTOR ANALYSIS TO DETERMINE POVERTY REDUCTION VARIABLES, INTERNAL MIGRATION AND DEVELOPMENT IN GHANA

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Abstract

This study determines how factor analysis can be used to categorize poverty reduction variables, internal migration and to promote development in Ghana. The purpose is to find out which variables accounts for poverty reduction efforts in Ghana especially those that have implications for rural livelihoods. A total of 345 questionnaires from seven regions of Ghana were used to gather data from migrant-concentrated areas. The investigations show that negative or positive correlations carry the same weight. The three key variables emerged as the main cause of internal migration in Ghana. These were, Economic factors, Demographic factors, Social and cultural factors, Geographical and physical factors and Political and institutional factors and welfare and poverty as the main cause of internal migration in Ghana.

In recommendation, even though, this method has proven to be successful in explaining poverty reduction techniques, other methods could also be applied as alternative to the factor analysis. Internal migration plays an important role in sharpening peoples' lives, if not properly managed could be harmful to some extent. Factor analysis method is not good for small sample size for the reasons given above. Likelihood maximum ratio test should always be considered in place of the factor analysis.

In conclusion, nine variables were initially put into the computer and a test performed that allowed the nine variables to be reduced to three components namely, welfare, economic and poverty as the basic factors responsible for migration in Ghana. For other areas/regions, migration for a better employment produce labour force shortage and affects the potential of local economic and social development. The internal migration phenomenon is influenced by the economic evolution and open new possibilities for further analysis. Money sent by emigrants to their families is increasing their quality of life and has positive effects on the family relations.

Keywords: Internal Migration, poverty reduction, Development, factor analysis.

1. Introduction

Migration has been generally defined to consists of people whether as individuals or in groups that move across different geographic, administrative or political jurisdictions for temporary or permanent settlements for various reasons (Castles, 2004; Leon-Ledesma and Piracha, 2004; Nagaraja, 2012; Nicholae and Rabu, 2007). Since the movement between two geographical units does not have to occur directly, one can further make a distinction between the place of source or end region, transit regions, and the place of destination or receiving region (International Organization for Migration, IOM, 2012).

Three types of migrants are distinguishable namely: those seeking economic opportunity in the destination economy; migrants who aim to accumulate savings or human capital while away in order to have increased economic opportunities upon their return; and migrants who move because of political, ethnic or religious oppression in their home country (IOM, 2012). For the majority of migrants, the main driving force behind the migration decision is the desire to improve their material living conditions or quality of life (Concini and Hulme, 2007). Usually it is assumed that these migrants plan their movements and invest in information and those aspects of human capital that are necessary for a successful integration into the labour market and society of the receiving regions (Schuerkens, 2005).

In Ghana, the movements of people are mostly from both the rural and urban regions to relatively developed cities like Accra, Kumasi, Sekondi-Takoradi and recently, Tamale. Movements across international borders are called international migration, while internal migration, the focus of this study, is the movement within a country. In general, migration decision can be made by individuals, families or an extended family network (Tiemoko, 2004), but in the case of individual migrants, the decision of family migrants is only partly driven by their own social and economic considerations (Awuse and Tandoh-Offin, 2013). Thus, Haug (2008) argues that the opportunities and restrictions of all family members influence the decision to migrate or return. It might not be sufficient, therefore, to examine only individual motivations to understand migration decisions, especially of internal migrants. The purpose of this study, therefore, is to employ factor analysis to determine which poverty reduction variables with implications for rural livelihoods explain internal migration decisions and development in Ghana.

2. Statement of the Problem

The phenomenon of low income and rural urban movement has always been interconnected (Skeldon, 2008). International migration is dominant in recent debates on migration (IOM, 2012; Tiemoko, 2004). Meanwhile, internal migration is far more significant in terms of the numbers of people involved and perhaps even the quantum of internal remittances that the people send home and the potential that it offers for poverty reduction, despite its inability to attract

much attention from policy-makers and governments (IOM, 2012; Nagaraja, 2012). In addition, there must be winners and losers in the internal migration in terms of economic growth and development of economies (Docquier and Rapoport, 2007) including that of Ghana. It is against this background that this paper intends to address the ridiculous question that development experts often asked: How do we categorise poverty reduction variables?

3. Literature Review

The purpose of this literature review is to examine the links between poverty reduction, internal migration and development in Ghana as a way to contribute to the relatively scanty research that exist in this area from Ghana's perspective. According to Hainmueller and Hiscox (2007), scarcity and susceptibility have two inconsistent effects on migration: in one sense, they may act as incentives to migrate, either as an approach for livelihood diversification or out of impoverishment; Meanwhile, they could also serve as to minimize the aptitude to migrate because of the possibility to cause a large shift in the expenditure involved, in terms of resources (Barro 1999; Calderon and Serven 2004; Ehrhart, 2009; Mughal and Diawara 2011).

In times past, internal movements of people was engaged in aggressively for continued existence, to flourish, or to run away from lack of self-confidence and dearth, and to move in answer to opportunities that exist (Mare, 2000; Noakes, 2000). Internal Migration is not an explanation for improvement; on the other hand, if it is handled well with proper policies and implementation strategies it can bring most important reimbursement in terms of development and poverty reduction (Carling, 2008). Internal Migration brings major economic benefits that can be used to reduce poverty (Ratha, 2003).

A critical analysis of internal migration benefits were scattered, disproportionately, among countries, regions, districts and social groups. The equilibrium and distribution of internal migration benefits depends upon the nature of the migration in question, and the relations that migration creates among places of source and purpose (Adams and Page, 2003; Litchfield and Waddington, 2003; Taylor, 1996). An investigation by concluded indicates that as the poor are usually forced to migrate, and this situation has the potential to extend their insolvency. In addition, internal migration has the option to source people to go down into scarcity or may promote existing poverty of both the migrant and 'sending' households (Massey 1999). The relationship therefore, between poverty and migration is unlikely to be widened.

The fact that global poverty levels continue to fall in the past 100 years especially in the last three decades is a significant accomplishment. In 1981, 52 percent of the world population lived on less than $1.25 a day. By 2005, that rate had been cut in half, to 25 percent, and by 2008 to 22.2 percent (World Bank 2012). Introductory estimates for 2010 point out that the extreme poverty rate has fallen further still; if follow-up studies cosnfirm this, the Millennium Development Goal (MDG) of halving world poverty will have been reached five years early (World Bank, 2010). In recent years, poverty reduction has continued in most countries, even after the financial, food, and fuel shocks of 2008-09.

According to the World Bank (2001), defining poverty solely as being deprived of money is however, not sufficient. Social indicators and indicators of risk and vulnerability must also be considered and understood to obtain a clear picture of poverty. The World Bank uses social indicators like availability of infrastructural services, including safe water, sanitation, solid waste collection and disposal, storm drainage, public transportation, access roads and footpaths, street lighting and public telephones are all factors to consider with regards to poverty definition. It uses basic facilities considered essential to human survival to describe poverty (World Bank 2012). In some countries, other neighbourhood amenities such as safe play areas, community facilities, electrical connections, and social services become important in helping increase the standard of living so that the poor can break. In a situation where this is lacking, a country's definition of poverty as being poor is somewhat justified. We can think of one's well-being as the command over commodities in general; people are better off if they have a greater command over resources. We can also think of the ability to obtain a specific type of consumption good (e.g. food, housing). People who have a lack of capabilities might have lower well-being.

4. Research Methodology

Factor analysis is a collection of methods used to examine how underlying constructs influence the responses on a number of measured variables. There are basically two types of factor analysis: exploratory and confirmatory. Exploratory factor analysis (EFA) attempts to discover the nature of the constructs influencing a set of responses. Confirmatory factor analysis (CFA) tests whether a specified set of constructs is influencing responses in a predicted way.

Both types of factor analyses are based on the Common Factor Model. This model proposes that each observed response is influenced partially by underlying common factors (factor 1 and factor 2) and partially by underlying unique factors. The strength of the link between each factor and each measure varies, such that a given factor influences some measures more than others. Factor analyses are performed by examining the pattern of correlations (or covariance's) between the observed measures. Measures that are highly correlated (either positively or negatively) are likely to influence the same factors, while those that are relatively uncorrelated are likely influenced by different factors.

Construct factor scores for further analysis. If you wish to perform additional analyses using the factors as variables you will need to construct factor scores. The score for a given factor is a linear combination of all of the measures, weighted by the corresponding factor loading. Sometimes factor scores are idealized, assigning a value of 1 to strongly positive loadings, a value of -1 to strongly negative loadings, and a value of 0 to intermediate loadings. These factor scores can then be used in analyses just like any other variable, although you should remember that they will be strongly collinear with the measures used to generate them.

Factor analysis is a method for investigating whether a number of variables of interest Y1, Y2, Y3, Y4, Y5, Y6, Y7and Y8 :, Yl, are linearly related to a smaller number of unobservable factors F1, F2, : : :, Fk . Factor analysis is best explained in the context of Poverty reduction model.

Poverty Reduction Model

F1 (Age) + F2 (Occupation) + F3 (Origin) F4 + (Income) F5 + (Education F6 + (Health) F7 + (Employment) F8 + (Gender) F9

It has been recommended that these variables are functions of two fundamental factors, F1 and F2, uncertainly described as poverty reduction and internal migration, respectively. It is assumed that each Z variable is linearly related to the two factors, as follows:

$Z1 = \beta10 + \beta11F1 + \beta12F2f3 + \mu1$
$Z2 = \beta20 + \beta21F1 + \beta22F3f4 + \mu2$
$Z3 = \beta30 + \beta31F1 + \beta32F4f5 + \mu3$
$Z4 = \beta40 + \beta41F1 + \beta42f5f6 + \mu4$
$Z5 = \beta50 + \beta51F1 + \beta52F6f7 + \mu5$
$Z6 = \beta60 + \beta61F2 + \beta62F7f8 + \mu6$

The error terms e1, e2, and e3, serve to indicate that the hypothesized relationships are not exact.

5. Presentation of Results

Nine variables were originally put into the computer to test for the presence of variance. It is the proportion of variance accounted for by the common factors or communality of a variable. Communalities range from 0 to 1. Where zero means that the common factors do not explain any variance and one means that the common factors explain all the variance. It was evident that preliminary test conducted qualifies us to use factor analysis test to be applied on this particular question. So we went ahead to perform the test using factor analysis.

A component matrix which indicates how each item in the analysis correlates with each of the three retained factors. Negative or positive correlations carry the same weight. In terms of contributions of this paper to knowledge, it is stated frankly that we can get the dependent variable which was not initially given from the use of factor analysis method. It was observed from this study that we formerly did not know which variables constituted poverty reduction, since we took nine parameters in to consideration and asked the system to classify them for us, which it has come out with three variables namely, welfares factors, economic and poverty related variables as can be found in the tables below:

Table 1: A diagram showing Factor Analysis

Commonalities	Initial	Extraction
I believe that migration can reduce poverty	1.000	.554
People migrate from poor areas to places they can get something to do	1.000	.270
Apart from economic reason, there are other significant reasons why people migrate	1.000	.376
People migrate mainly from rural areas to urban centers	1.000	.541
Internal migration helps the individual to acquire formal education for self or dependents	1.000	.549
Remittance improve the livelihood of individuals and household	1.000	.391
We use the remittances mainly for consumption	1.000	.408
Remittances are considered by the family as additional income	1.000	.501
What internal migration has enabled you and household to do. A scale of 5-1 with5 being highest &1 least	1.000	.565

Source: Field work, 2013

According to Field 2000 the bigger the sample the smaller the loadings can be for a study to be significant. Stevens (1992) made a critical values table to determine this significance. Field again states, on the other hand, that "the significance of a loading gives little indication of the substantive importance of a variable to a factor" (Field 2000; Rietveld & Van Hout 1993). For this to determine, the loadings have to be squared. Stevens 1992: in Field 2000 then "recommends interpreting only factor loadings with an absolute value greater than 0.4 (which explain around 16% of variance)". This is only possible in principal component analysis.

Table 2: A diagram Showing Total Variance Explained

Component Matrix	Component		
	1	2	3
i believe that migration can reduce poverty	.392	.352	.525
people migrate from poor areas to places they can get something to do	.361	.296	.228
Apart from economic reason, there are other significant reasons why people migrate	.496	-.355	.063
people migrate mainly from rural areas to urban centres	.356	.621	.168
internal migration helps the individual to obtain formal for self or dependents	.432	.176	-.575
remittance improve the livelihood of individuals and household	.560	-.237	.145
we use the remittances mainly for consumption	.620	-.061	-.141
remittances are considered by the family as additional income	.605	-.197	-.310
what internal migration has enabled you and household to do. A scale of 5-1 with5 being highest &1 least	.134	-.569	.472

Source: Field Work, 2013

6. Discussion of the Results

One of the interesting uses of factor analysis in this study is to determine how the covariates covary with the dependent variable. As it happens, these covariates measure different aspects of the learner's knowledge, like poverty reduction, internal migration, and economic condition. By discovering which sub measurements cluster on which covariates to which account, it might be possible to find out which kinds of knowledge are used.

One positive effect of internal migration is the remittances, with strong implications at macroeconomic at microeconomic level. Remittances' effects at macroeconomic level are rather difficult to capture in Ghana because of their action on a large number of macroeconomic variables. The most visible and immediate impact of remittances is on the households' consumption, important at macroeconomic level as being part of the aggregate domestic demand, component of the GDP. But remittances also affect investments and savings. Remittances received by households directly increase their disposable income; hence increase consumption which leads to temporary poverty reduction. They can also reduce inequalities through their distributional effects.

The worse affected families go through bringing up the rear one or more members on a provisional basis. In fact, the longer the time of departure is, the more significant the effects on the family are. As a member of the family left, determines reorganization of the roles within the family. Consequently, left behind members of the families take over the responsibilities or functions of those who migrated for employment which it can affect the well being of the family or of the couple relationship. This could lead to family demobilization (divorces).

Some scholars have advised us to avoid using factor analysis on items for several reasons. One is that we often get factors that correspond to characteristics of the distribution of responses rather than content. For example, we may get factors that correspond to easy and hard items. We may get factors of positive and negative items just because a few people missed the not in some of the negative items. Another reason is that the distribution of responses and errors cannot be normally distributed (even approximately) with variables that only have less possible values. This is important if we are going to use maximum likelihood estimates or significance tests. In my opinion you certainly have to watch out for bogus factors. However, when the factors correspond to meaningful content differences, factor analysis presents a very powerful tool for creating multiple scales with high internal consistency and good discriminate validity. High internal consistency will result if you choose items that all have high factor loadings on the same factor (there is a mathematical relation between the loadings and alpha). If you delete items that load on the wrong factor, you promote discriminate validity.

7. Conclusion

All in all, nine variables were initially put into the computer and a test performed that allowed the nine variables to be reduced to three components namely, welfare, economic and poverty as the basic factors responsible for migration in Ghana. For other areas/regions, migration for a better employment produce labour force shortage and affects the potential of local economic and social development. The internal migration phenomenon is influenced by the economic evolution and open new possibilities for further analysis. Money sent by emigrants to their families is increasing their quality of life and has positive effects on the family relations.

8. Recommendation

Even though, this method has proven to be successful in explaining poverty reduction techniques, other methods could also be applied as alternative to the factor analysis. Internal migration plays an important role in sharpening people lives, if not properly managed could be harmful to some extent. Factor analysis method is not good for small sample size for the reasons given above. Likelihood maximum ratio test should always be considered in place of the factor analysis.

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