Macroeconomic Immigration Determinants: an Analysis of 'Pull' Factors of International Migration to South Africa

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Abstract

This research empirically examines the macroeconomic determinants of 'pull' factors of international migration in South Africa. Using the neoclassical economic model of international migration, an Ordinary Least Square (OLS) regression was run on time-series data from the World Bank data base for the period 1990-2012. Relevant data from the South African Department of Home Affairs' Annual Reports were also used. GDP per capita, inflation rate, real interest rate, employment rate and public health expenditure were found to be the key determinants which entice migrants away from their countries and direct them to "better off" destinations. The country's public education system, on the other hand, is not a significant attraction for foreign migrants. The study concludes that the South African government urgently needs to implement not only skilled worker-attractive immigration policies but also appropriate fiscal and monetary restructuring policies aimed at growing the economy and creating employment opportunities.

Keywords: Education, employment, foreigners, government, inflation, international, migration, 'Pull' factors and South Africa

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Introduction

International migration is an escalating practice of our times. This process whereby millions of people flow across traditional social and geographical boundaries has altered the global landscape (Hatton, 1995; Lee, 1926). The decision to emigrate depends on a combination of factors, such as lack of social security and justice, political instability, a low level of confidence in the state, as well as better opportunities for work abroad (Kurunova, 2013). However, these flows generate socio-economic and political challenges in migrant destination countries and have thus raised complex questions for policy makers and researchers. In this response, researchers (Castles, 2010; Hatton, 1995; Lee, 1926; Mayda 2003; Mayda, 2010; Nwajiuba, 2005; Rodrick 1995; Stark, 1984; Taylor, 1999) have developed a wide range of theoretical and conceptual frameworks (both econometric and mathematical) aimed at analysing international migration. For example Kurunova (2013) indicates that each theory of international migration focuses on a separate aspect of the migration relationship such as factors that 'push' or 'pull' migrants, globalisation factors of migration, migration networks, migration implications for the labour market in host countries or the countries of origin, and the impact of migration on income distribution in a given region.

The aim of this research is to provide an empirical investigation into the macroeconomic determinants of 'pull' factors of international migration in South Africa, using the neoclassical economic model of international migration. However, in order to make a case for an empirical analysis, the presence of reliable statistical data is very important, although at the same time the research is limited by it. In this particular research, apart from focusing on registered migration because only official statistics is readily available, selected 'pull' factors such as *GDP per capita, inflation rate, real interest rate, employment rate, public health expenditure and education expenditure* are also included. Ordinary Least Square (OLS) regression was run on time-series data for the period 1990-2012 collected from the World Bank data base and the South African Department of Home Affairs. Results of the study show that GDP per capita, inflation rate, real interest rate, employment rate and public health expenditure are important migration 'pull' factors.

The paper is organised as follows. Section 1 gives a general introduction to international migration. Section 2 presents a background to past and recent

trends in international migration in South Africa. Section 3 reviews literature on the subject and generates a theoretical framework for the study. Section 4 presents the econometric techniques used. Section 5 shows and discusses the empirical results. Section 6 presents the conclusions and policy recommendations.

Background

The issue of international immigration into South Africa has a long history spanning several centuries. Cross (2000) observes that its beginnings can certainly be traced to 19th Century white settlement and the consequent establishment of colonial rule, when hundreds of thousands of Europeans permanently immigrated to the country. Thereafter, the opening up of large sugar cane fields in Natal also attracted large flows of immigrants especially from India, as did the establishment of diamond and gold mines in Kimberly and on the Witwatersrand in the late 19th and early 20th centuries which brought in large numbers of labourers from several neighbouring countries such Mozambique, Lesotho and Zimbabwe. From the beginning of the early 20th century South Africa's population contained a sizeable foreign migrant stock. The 1911 Census for example, revealed that foreign migrants from neighboring countries made up 6 percent of South Africa's total population. The foreign migrant stock reached a total of 836, 000 in 1961 (Peberdy, 1997). Ayala et al. (2013) observe that even though there is no reliable data on the exact immigrant numbers, especially during the pre-Apartheid period, there are at least four international immigration routes that are known in the country's history. These include: contract labourers on the mines, informal immigrants to work in the construction and service sectors, refugees from the Mozambican conflict; and white 'asylum seekers' from neighbouring countries.

The imposition of a white-supremacist form of government (Apartheid) in 1948 had a profound effect on South Africa's migration policy (Peberdy and Crush, 2000). Successive Apartheid governments pursued a racially-oriented policy favouring white immigration while at the same time restricting black/African and later on Jewish inflows into the country. Even though successive Apartheid governments recognised the need for cheap foreign labour to work on the mines and farms, they only encouraged clandestine immigration from neighbouring countries and also blocked foreign immigrants from acquiring temporary or permanent South African residency. In contrast, white immigrants escaping from political

uncertainty in newly-independent African countries such as Zambia, Kenya, and Zimbabwe were offered citizenship between 1960 and 1980 in order to boost the white population in South Africa (Peberdy, 1997; Peberdy & Crush, 1998). The above authors observe that some of the significant colonial and Apartheid-era restrictive migration laws were passed in the years 1913, 1930, 1937 and 1991.

With the end of Apartheid and the consequent ushering in of the democratic era in the country in 1994, the African National Congress-led government has continued pursuing a more restrictive migration policy in the post-Apartheid era (Crush & Peberdy, 2003). Apart from giving out a few amnesties to political asylum-seekers and refugees from some Sub-Sahara African countries, the South African government has generally shown little appetite for immigration. For example, legal labour migration to the country has been on the decline since the early 1990s, as the more restrictive policies put in place have made it difficult for employers to obtain work permits for foreign contract workers (Crush & McDonald, 2003). Despite these restrictive migration policies, international migration into South Africa has continued to surge. The majority of migrants have come from Sub-Saharan African countries mainly in search of employment and other economic opportunities in this regional economic super-power (Adepoju, 1998). The increase in economic immigrants primarily from neighbouring countries has occasionally been met with hostility from the generally poor and unemployed sections of South African society who view foreign migrants as direct competitors for jobs in the primary sectors of the economy. This hostility erupted into violent xenophobic attacks in May, 2008 when several small-scale businesses mainly owned by Zimbabwean, Mozambican, and Malawian immigrants were destroyed by groups of South Africans across several cities (Friebel, Gallego & Mendola; 2013).

Klotz (2000) notes that each year hundreds of thousands migrants from all over the world come to South Africa legally and illegally in search of socio-economic and political opportunities. Kok et al. (2006) categorise these migration inflows into three groups, namely labour mobility, refugees, and permanent migrants. At present it is estimated that the total foreign population in South Africa ranges between seven and eight million. This constitutes approximately 5.7 percent of the country's total population of 51 million (Stats SA, 2012). Although there is significant dispute with regard to the exact number of illegal immigrants, the same cannot be said about the statistics of foreign people living in the country legally. Statistics

South Africa (Stats SA) shows that a total of 142,833 temporary residence permits (TRPs) and permanent residence permits (PRPs) were issued to foreign nationals by the Department of Home Affairs in 2012. In fact, 45.6 percent of the TRPs were issued to nationals from overseas countries (mainly India, China, Pakistan, and Britain), while 54.4 percent were issued to people from the African continent (mainly Zimbabwe, Nigeria, Democratic Republic of the Congo, and Lesotho). On the other hand, people from the overseas countries accounted for 46.8 percent of PRPs while those originating from the African continent constituted 53.2 percent of the total PRPs issued in 2012 (Stat SA; 2013).

From the above description and other available literature, there seems to be considerable agreement among researchers that economic factors are the main driver of immigration to South Africa. For example the United Nations Development Programme (UNDP) observes that the majority of African migrants who go to South Africa do so simply because conditions in their countries of origin have plummeted to a point below their tolerance threshold. . A prime example is the high number of Zimbabwean immigrants currently residing in the South Africa. The organisation further points out that the main driving force is the 'pull' of opportunity in the destination country, as well as the 'push' of abject poverty in their places of origin (Crush & Frayne, 2007). Adepoju (2000) observes that socio-economic insecurity, abject poverty and extreme unemployment in some rural areas of Africa have transformed what could otherwise have been internal migration to urban centres into international emigration to neighbouring, more prosperous nations such as South Africa.

But despite this consensus on economic forces that drive migrants out of their countries of origin, very little is known about the macroeconomic factors that attract ('pull') people to South Africa. The majority of studies (Lucas, 1987; Bhorat et al., 2002; Wocke and Klein, 2002; Bhorat, 2004; Waller, 2006; Lindau and Segatti, 2009; Crush and Williams, 2010; Friebel et al., 2013; Mayda et al., 2013) that have been conducted so far on the subject in the country seem to focus mainly on migration trends and migration effects on the labour market, but not on its macroeconomic determinants. Against this background therefore; it is evident that there is a major knowledge gap in the key macroeconomic determinants of international migration in South Africa and how these 'pull' factors have affected the foreign migrant inflows into the country in the post-Apartheid era. This study aims, therefore, not only to fill this gap but also to come up

with relevant policy recommendations that can help the country maximise the benefits of this human inflow. Furthermore, the aim of this paper is to provide macroeconomic suggestions that could help stem the rising tide of xenophobic feelings against foreigners which are held mainly by the impoverished and unemployed section of the South African population which perceives immigrants as a direct opponents vying for their jobs and other economic opportunities.

Literature Review

There is a great deal of literature (Castles, 2010; Hatton, 1995; Lee, 1926; Mayda 2003; Mayda, 2010; Nwajiuba, 2005; Rodrick 1995; Stark, 1984; Taylor, 1999) on international migration both in developed and developing countries. The majority of these migration theories seek to explain the causes and effects of the movement of people across a specified boundary for the purpose of establishing a new or semi-permanent residence. Two of the major migration theories include Ravenstein's theory of migration, and the 'pull-push' theory of migration. The following section analyses the key understanding of these major theories, and traces their main principles and practical applications.

Ravenstein theory of migration. Ernst Georg Ravenstein (1834-1913) developed a theory of human migration which today is still considered the backbone of the modern migration theory. Using a combination of individual rational choice theory, Newtonian physics, and other rural-urban and developmental perspectives he came up with empirical generalisations on the flow of human beings between places. These empirical generalisations which have come to be called 'Ravenstein's Laws of Migration' were mainly developed from British and other European census data in the 1800s (Ravenstein; 1885). de Haas (2009) gives a summary of these seven laws as follows: (1) most migration occurs within a short distance; (2) The majority of migration movements are from agricultural to industrial regions; (3) expansion of most bigger town centres is as a result of migration rather than natural growth; (4) migration develops in tandem with industrial, commercial and transportation expansion; (5) every migration flow produces a counter-flow; (6) Most women undertake short distance migration while the majority of men indulge in international migration; (7) economic causes are at the centre of most migration flows.

'Pull-Push' theory of migration. This theory largely builds on Ravenstein 'laws of migration'. According to King (2012) the 'pull-push' migration theory argues that migration comes about because of economic and socio-political factors present in both the source and destination migration countries. Factors such as poverty, unemployment, political repression, poverty etc. drive out ('push') people out of their home (source) countries. On the other hand, there also factors present in the destination countries which pull or attract migrants; these include better income and employment prospects, better social welfare services, political freedom etc. Lee (1966) adds that for the 'pull and push' factors to effectively influence migration there are several intervening obstacles that must be overcome. These obstacles can be physical (e.g. distance), economic (e.g. financial cost of migration), political (international borders), and cultural barriers (e.g. language problems). He further observes that personal factors also play a vital role in migration since people's response to the 'pull and push' stimuli will vary depending of their socio-economic and cultural orientation. From the above theoretical background several models explaining migration have been developed, and these are normally classified in two categories: (1) theoretical models that describe the initiation process of migration; and (2) models that explain the continuation process of migration.

Models Explaining the Initiation and Process of International Migration

The literature identifies a variety of theoretical models (Massey et al., 1993, 1998; Schoorl, 1995) that can be used to model the effects of migration. In the early 1950s, in particular, there was a large body of literature produced on migration. This research does not propose to review all of this literature, nor all of the models available. It surveys some of the main models explaining the initiation and process of international migration. A brief description of models explaining the initiation and process of international migration is given below in Table 1.

Table 1: Models explaining the initiation and process of international migration

Models explaining the initiation of international migration	
Theories	*Brief description theories*
Neoclassical Economic Theory	The theory argues that real wage differences between countries drive people from lower to higher wage regions. This trend continues until wages in all regions equalize and migration stops (Massey et al., 1993, 1998; Borjas, 1989).
Dual Labour Market Theory	The dual labour market states that international migration is determined by 'push' (supply) and 'pull' (demand) factors in migrant sending and receiving countries respectively. Demand pressures generated in primary sectors of labour markets of more developed countries stimulate the supply of international labour migration from less developed countries (Piore, 1979).
New Economics of Labour Migration Theory	This theory states that migration flows and patterns cannot be explained solely at the level of individual workers and their economic incentives, but that wider social entities must be considered as well. Remittances, and more importantly the possibility of achieving an uninterrupted flow of household income, are the main drivers of international migration (Stark & Bloom, 1985; Taylor, 1999)
Relative Deprivation Theory	The theory indicates that awareness among individuals of the existence of income/wage differentials between migrant-sending countries and migrant-receiving nations is the main incentive for international migration (Stark & Taylor, 1993).
World Systems Theory	The basic argument of the theory is that the reliance on the international market has led to richer countries (core countries) dominating transitional capital at the expense of poor countries (semi-peripheral and core countries). The unequal exchange results in migration from poorer to richer countries (Wallerstein, 1983; Amankwaa, 1995).
Models explaining the process of international migration	
Network Theory	The theory argues that international flows of people between countries generate networks of migrants and other person-to-person linkages between the migrant sending countries and the receiving countries which serve to perpetuate more migration (Esveldt et al., 1995).
Institutional Theory	The theory shows that the international outflow and inflow of migrants attracts and generates both legal and illegal profit and charity organisations which help in perpetuating this tendency by offering financial, material, legal, and logistical support to immigrants (Massey et al., 1993).

In synthesizing all the above theories it is clear that economic factors have played a very crucial role in the development of international migration theory. Even though at first glance network and institutional theories do not seem to place significant emphasis on economic variables, a close examination of the two theories reveals that their vital aspects can be rendered important drivers of migration. As clearly argued by Jenissen (2004), the presence of a large migrant network will not only reduce the costs of migration but will also increase the chances of migrants obtaining jobs in the receiving country. A similar situation avails where institutions created because of migration flows also reduce the cost of migration.

Empirical Studies Targeting the Macroeconomic Determinants

Several empirical studies (e.g. Bach, 2003; Jerome, 1926; Kelley, 1965; Lichfield and Waddington, 2003; McDonald and Crush, 2002; Nwajiuba, 2005; Tsegai and Plotnikova, 2004; Wentzel and Bosman, 2001; Wentzel and Viljoen, 2006; Wouterse and Van den Berg, 2004) have been undertaken by researchers across the globe specifically targeting the macroeconomic determinants of migration.

For example, Jerome (1926) was one of the first to study this issue. He examined United States (US) immigration from Europe over a hundred year period prior to the imposition of U.S. immigration quotas in the 1920s and concluded that economic conditions in the United States were primarily responsible for short-cycle movements in European emigration to the U.S. On a similar note, Kelley (1965), in agreement with Jerome's findings, also observed that economic factors, mainly employment opportunities, were the main reason for the rising emigration of people from Britain to Australia between 1865 and 1935. All the different migration models employed in his analysis confirmed the above findings. Several similar studies have also been undertaken in Africa. In one such study aimed at establishing the main reason for migration from Nigeria to other countries, Nwajiuba (2005) found that economic factors account for 80 percent of the reasons people are attracted to foreign nations, while educational factors take up only 18 percent of the 'pull' factors.

In Burkina Faso, Wouterse and Van den Berg (2004) found that employment opportunities and the possibility of earning higher income lure the country's poor households into migrating to other African countries. On the other hand, richer Burkinabe households are attracted to

overseas countries by the perceived wealth accumulation prospects present in those countries. In a cross-border migration study targeting the causes of migration by Mozambicans and Zimbabweans into South Africa, Wentzel and Bosman (2001) found that macroeconomic variables were the main determinant. Indeed the two authors found that nationals of the above countries were compelled to emigrate because South Africa offered these people better employment prospects, higher wages, lower average prices of goods, and a more stable currency value relative to their home countries. This study also found that non-economic factors had a very insignificant 'pull' effect on cross-border migration to South Africa. McDonald and Crush (2002) conducted several studies to determine the factors that attract international immigrants to South Africa and Botswana. Among all the considered variables, the study found that the economic attraction of the above economies is the main 'pull' factor that lures international migrants. In a similar vein, the 2001-02 HRSC international migration survey conducted by Brown University also found that more than two-thirds of all international skilled migrants come to South Africa because of the lure of finding not only 'suitable' employment opportunities but also increasing their income earnings (Wentzel & Viljoen, 2006).

Despite the dominance of economic factors in the international migration literature, some surveys show that non-economic factors are the main determinants of migration flows between countries. Researchers such as Lichfield and Waddington (2003), and Tsegai and Plotnikova (2004) found that in Ghana more-qualified citizens are more likely to migrate than less-qualified citizens. They therefore conclude that the likelihood of migration increases with education. Similarly, Bach (2003) found that emigration of South African nurses to Britain has largely been driven by nurses associations and other networks of the South African diaspora present in the destination country. With the above contradiction in the empirical literature it is therefore necessary to conduct empirical research to determine whether or not economic (macroeconomic) factors are the main 'pull' factors for migration to South Africa.

Econometric Techniques Used

Todaro and Smith (2009) note that models play a major role in econometric studies, whether theoretical or applied. According to them, a model is a simplified representation of an actual phenomenon. The actual phenomenon is represented by the model in order to explain it, to predict it,

and to control it, goals corresponding to the three purposes of econometrics, namely structural analysis, forecasting, and policy evaluation. In order to analyse the macroeconomic determinants of immigration into South Africa the study employed a theoretical framework largely based on the Neoclassical Economic Theory of Migration. Essentially this theory which was founded by Todaro (1969) and Todaro and Harris (1970), views migration as emanating from differences in endowments of labour relative to capital. The resultant wage differentials drive workers to vacate low-wage, labour-surplus regions in favour of high-wage, labour-scarce regions. Simply put, migration is an economically rational process in which people move from their places of origin to new areas when their net present value income calculation in the new area is greater than the average income in their place of origin (Todaro & Smith, 2009).

It is clear therefore that the theory looks at economic factors such as utility maximization, wage and other factor-price differentials, and ease of labour movement and substitution as the main determinants that drive out and attract people in the process of migration. According to Massey et al. (1998) these economic factors operate at both the micro and macro levels of the economy. The above researchers argue that migration occurs at the macroeconomic level as a result of uneven distribution of labour in relation to other production factors. On the micro level, it is argued that migration occurs on the household and individual level because people use the information available and make rational choices on whether or not to migrate based on informed cost-benefit analyses. To this end researchers such as Sjaastad (1962) and Borjas (1989) derived calculus migration models depicting how individuals come up with decisions to migrate both to areas within and outside their countries, taking into account the costs and benefits of the process. An illustration of this concept is given by Massey et al. (1993) who incorporate computations of probability of escaping deportation from the receiving country, the probability of securing employment in both the country of destination and country of origin and a time component (t). This is specified in the model below as follows:

$$ER(0) = \int_0^t [P_1(t) \, P_2(t) \, Y_d(t) - P_3(t) \, Y_0(t)] \, e^{-rt} \, dt - C(0)$$

ER (0): expected net return to migration just before departure at time 0

P_1 (t): probability of avoiding deportation from the area of destination

P_2 (t): probability of finding work in the destination country

P_3 (t): probability of finding work in the country of origin

Y_d (t): total earnings if employed in the country of destination

Y_0 (t): total earnings if employed in the country of origin

r: rate of discount

C (0): total of the cost of migrating

From the above formulation, Massey et al. (1993) observe that if the expected net return to migration has a value greater than zero, rationality demands that the individual migrate. On the other hand, if the value is negative then a rational individual stays in his/her home country. Suffice to say that when an individual is faced with a positive net return on migration for several countries, rationality will drive him/her to the country with the greatest value. Borjas (1989) therefore indicates that the neo-classical theory emphasises the importance of taking into account labour market structures, human capital and income distribution both in the country of origin and the country of destination in explaining the individuals' choice of where to migrate. Even though the theory was initially designed to explain rural-urban migration, it has of late been extensively applied to analysing the determinants of international migration. In this regard, Malmberg (1999) points out that some of the advantages of Neoclassical Model of Migration are that it forms the basis of most of the migration models. In addition, Malmberg (1999) argues that the model has a clear logic and simple economic explanation of the causes of both internal and international migration. De Haas (2009) observes that the strength of the neoclassical theory of migration is its dynamism in explaining and forecasting the initial conditions in which it took place. The author further observes that the theory perceives migration as a mode of optimally allocating factors of production. Holding other things constant, migration influences labour to become scarcer in the sending than in the origin region. The opposite occurs with the capital factor of production. Schiff (1997) states that this leads to equalisation of factors of production as wages converge in both the migration source and the destination countries. With this convergence of wages and factor prices, the above researcher argues that migration stops as wage differentials and cost of migration equalise in the long-run.

Despite the above strengths the Neoclassical Theory of Migration is criticised for its minor emphasis on structure and agency which are important notions in social relations (Castles, 2010). The crux of the critique is that since the theory emphasises perfect information and human behaviour as aggregated, it reduces individuals to 'automatons' who passively respond to macro-level 'pull-push' migration determinants. Its critics argue, therefore, that the theory has limited power to explain migration transformations and social relation patterns (de Haas, 2010).

Formulation of the Empirical Model and Measurement

As already alluded to, a considerable amount of empirical literature is available on international migration econometric modelling including authoritative empirical surveys conducted by Borjas (1989, 1994, 1999); Ghatak et al., (1996);, and Mitchel and Pain (2002. These studies have suggested that it is not only macroeconomic factors but also socio-political conditions in receiving countries that attract emigrants. However, since this study contains a small dataset of 22 observations, it is not possible to incorporate all the macroeconomic determinants suggested by some of the above authoritative studies. Instead this study attempts to build an econometric model based on the theoretical foundation set by the Neoclassical Economic Model of Migration as expounded by researchers such as Ahmad et al., 2008; Brucker et al., 2003; and Mitchell and Pain, 2003. The above models look at international migration as a function of various macroeconomic variables. Mathematically this is depicted by the formulation below.

$$IM = f(U_i, ..., U_n)$$

Where *IM* represents international migration into South Africa, and *U* gives a set of macroeconomic variables that attract foreign migrants to the country.

Following the neoclassical theoretical framework and the majority of empirical studies carried out on the subject, the model considered the following macroeconomic variables: employment rate (ER); per capita gross domestic product (GDPPC); inflation rate (INFLR); government spending on health and educators (PUBEXPH and PUBEXPEDU); and employment rate (EMPR). Therefore the relationship between

international migration and the above macroeconomic variables is given in the mathematical formulations below.

$$IM = f \text{ (GDPPC, INFLR, RINTR, EMPR, PUBEXPH, PUBEXPEDU)}$$

The above function is then reduced into the following linear regression equation

$$IM = \alpha_0 + \alpha_1 \text{ GDPPC} + \alpha_2 \text{ INFLR} + \alpha_3 \text{ RINTR} + \alpha_4 \text{ EMPR} + \alpha_5 \text{ PUBEXPH} + \alpha_6 \text{ PUBEXPEDU} + \mu$$

Where α_i represents regression coefficients, and μ represents the random/stochastic error term.

Following the tradition used in many international migration studies, this research operationalises the above macroeconomic determinants as follows:

International migration is approximated by total migrant stock i.e. the percentage of foreign nationals in the total population of South Africa.

This is a more practical and feasible way of measuring the total number of foreign migrants considering the unreliability and unavailability of data on this topic. Annual per capita gross domestic product was used to approximate the standard of living in South Africa which shows the average distribution of national income to each individual residing in the country. Additionally, the study used annual employment rate as the number of job opportunities available in the country per year. Furthermore, the country's cost of living and the stability of the economy approximated by the annual inflation rate are also used. Annual government expenditure on education and health as a percentage of the GDP was used to approximate state provision of social services and welfare. Similarly, the value of the annual real interest rate was used to measure the stability of business and the investment climate in South Africa. The model also incorporated the random error term to approximate other unobservable macroeconomic factors that affect international migration to South Africa but they have not been captured in the model.

Data used in the study. It must be stated that data on immigration inflows into South Africa are poor and unreliable, just as in other Sub-Saharan

African countries. This is mainly due to weaknesses in immigration data collection agencies, and the laxity of border control regulations in the country which sometimes makes it easy for illegal migrants to evade border controls (Shaw, 2007). In order to address these concerns the study used secondary annual data from the World Bank and Annual Reports' of the Department of Home Affairs from 1990 to 2012.

Diagnostic Tests for Ordinary Least-Squares (OLS) Regression: Before OLS regression could be conducted on the time series, several regression diagnostic tests had to be performed in order to come up with accurate, efficient, and unbiased results. However, the reliability of the above OLS regression estimation technique is guaranteed only if the assumptions of the BLUE (Best Linear Unbiased Estimates) hold. Violation of these properties leads to spurious regression and hence incorrect conclusions (Gujarati & Porter, 2010). Therefore to ensure the adherence to the BLUE properties the following diagnostic tests were conducted on the time series: Augmented Dickey-Fuller Test, Multicollinearity Test, Breusch-Godfrey Test, Ramsey RESET Test, and Shapiro-Wilk Test.

Research Findings and Interpretation

The OLS regression diagnostic results showed no evidence of non-stationarity, multicollinearity, autocorrelation, model misspecification, and abnormally distributed residuals. This therefore gave research license to perform OLS regression, the results of which are summarised in the table below.

Table 2: OLS regression results

Explanatory Variables (regressors)	Variable Coefficient	Standard Error.t	Prob>t	Prob>F	R-Squared	Number of observations
GDP per capita	.0011725	.0002295	0.000			
Inflation rate	-.0889871	.0975325	0.376			
Real interest rate	-.0282949	.1188547	0.815			
Employment rate	.0271968	.03098	0.394			
Public health expenditure	.5068833	.22313	0.038	0.000	0.8723	22 years
Public education expenditure	-.0009993	.1267186	0.994			
Constant	.0288834	2.58864	0.991			

Source: authors' secondary data analysis using Stata

From the above results it can be seen that GDP per capita has a positive effect on immigration flows into South Africa. Indeed, a one percent increase in the country's standard of living results in a 0.0011725 increase in the level of foreign migration. Being Africa's leading economy and a middle-income country, South Africa boasts a higher standard of living relative to most of her Sub-Saharan counterparts. Its annual GDP per capita of approximately $3000 U.S. is a major source of attraction to the majority of immigrants from impoverished developing countries both from the African continent and beyond (Adepoju, 2003). A study by Facchini et al. (2013) on foreign labour migrants mainly from Zimbabwe and Mozambique also concurs with the above assertion by concluding that the prospect of a higher living standard relative to that present in their countries of origin drives thousands of immigrants into South Africa.

Table 2 also reveals that in South Africa there is an inverse relationship between inflation rate (cost of living) and the flow of foreign immigrants. In other words, a unit decrease in South Africa's cost of living increases the volume of immigration by 0.0889871 percent. This is not surprising given the fact that South Africa's economy has generally been stable relative to the majority of the source countries that the immigrants originate from, e.g. the Sub-Saharan African countries. With the average annual inflation rate (cost of living) averaging below 10 percent since the early 1990s, foreign migrants have found the country attractive for settlement. Studies by Macdonald and Crush (2004) also confirm the fact that cost of living is one of the macroeconomic 'pull' factors for migration into South Africa.

A rise in the level of real rate of interest reduces the movement of foreign citizens into South Africa. From the above results, it is clear that a percentage expansion in the annual value of real interest rate reduces immigration into the country by a factor of 0.0282949 percent. This is not surprising considering that South Africa is one of the most stable economies, and hence foreign-investor friendly, countries in Africa. This is evident in the consistency of interest rates which have remained below 6 percent since the 1980s. Confirmation of the positive impact of this on international migration inflows may be inferred from 2013 documented migration statistics which showed that 1.1 percent of temporary residence permits were issued for business/investment purposes (Stat SA, 2013).

South Africa's employment rate is another factor that attracts foreign migrants. From the above table, a unit increase in the employment level

generates a corresponding 0.0271968 percent increase in total immigration into the country each year. Despite the current high unemployment level in South Africa, it is slightly lower when compared to that of most of its neighbouring countries, such as Zimbabwe. Additionally, Cross (2006) observes that South Africa's economy has the biggest absorption capacity for urban labour migration in relation to any other African economy. The country is widely viewed by most Sub-Sahara African economic migrants as an attractive employment destination. The main 'pull' factors for skilled foreign workers in South Africa's labour market include better salary and retirement packages, opportunity to gain international work experience and increased career choices (Du Plessis, 2009; Rogerson & Rogerson, 2000). In addition; some researchers such as Sibanda and Zuberi (2004) even claim that some South African employers prefer recruiting immigrants to locals because of the former's willingness to accept lower wages and other poorer employment conditions.

In a similar vein, an increase in the level South African government expenditure on health services results in a 0.5068833 percent expansion in the number of foreign nationals attracted to the country. This shows that well-funded public health facilities are a 'pull' factor for immigrants. Gushulak and MacPherson (2001) observe that international migration benefits the health status of migrants by offering them a chance of treatment for pre-existing illnesses and/or reduces their probability of contracting new illnesses in the destination country. Therefore increased government spending on health services will more likely attract immigrants to South Africa since the country will be able to provide better public medical facilities than the countries that migrants originate from.

However, the study's results also indicate that improved education facilities are not a 'pull' factor for migrants into South Africa. This is shown by the Table 2 which states that a 1 percent increase in government spending on education reduces migration level by a factor of 0.0009993 percent. The negative relationship between education and immigration can perhaps be explained by the deteriorating public education system which paradoxically is one of the main reasons fuelling emigration of skilled professionals, such as health personnel from the country (Williams & Shaw, 2006; Bezuidenhout et al., 2009). It is a known fact that South Africa's education standards are deteriorating quite rapidly in relation to other middle-income countries and even some poorer Sub-Saharan African countries. The public education system is now characterised, among other

things, by: low education quality; declining pass rates at all levels; under-qualified teachers; poor teacher morale; and weak management (SACSIS, 2009). This may help to explain why the education standards do not have a significant impact on foreign migration into the country as the regression results in Table 2 show.

Conclusion and Recommendations

Conclusion

From the foregoing discussion it is clear that South Africa today faces an unprecedented inflow of migrants from all over the globe, the majority of whom have the potential to positively contribute to the country's development efforts. Several macroeconomic factors inside the country have been identified as fuelling this international migration. In relation to those of the origin countries these macroeconomic 'pull factors' include South Africa's higher standard of living, lower cost of living, stable economy, attractive investment climate and better state funding of social services such as health and education. Afolayan (2001) notes that if the government and other relevant stakeholders do not critically analyse these 'factors of attraction' the country's socio-economic development agenda will not be able to maximise the positive benefits from this human inflow but will suffer the full brunt of its negative consequences.

Recommendations

From the study it is clearly evident that the South African government has to holistically address some macroeconomic constraints that prevent it from maximising the positive contribution that international migrants make to the country, and hence achieve sustainable socio-economic prosperity for all its population. This could greatly diminish the fears and resentment that the local population generally harbour against foreign migrants. Some of the major macroeconomic reforms the government can implement are given below.

- The country needs to significantly increase its annual GDP growth rate so that it surpasses is demographic expansion rate. This can be done by undertaking structural macroeconomic reforms using monetary and fiscal instruments aimed at stimulating aggregate demand, while at the same time controlling its population growth

rate through family planning and civic education programmes. In the long run this will increase its standard of living as per capita GDP growth rates rise, thereby attracting more skilled foreign migrants and appeasing the majority of its poor citizens.

- The government and the South African Reserve Bank also need to control annual inflation rates by balancing the levels of aggregate demand and supply in the economy. This will reduce and eventually stabilise the cost of living as the country's aggregate price indices come down. The cost of living is a very important macroeconomic variable determining migration in South Africa as shown in the study by Rogerson and Rogerson (2003) which showed that high inflation rates cause 71 percent of all emigration of skilled South African medical workers to rich Western countries such as Britain, Australia, Canada and the United States of America.

- Monetary authorities in the country also need to implement policies that optimize the bank rate and exchange rate values in order to attract foreign investment. A lower bank rate and a stable value of the South African Rand will boost investor confidence and as the economy expands will attract not only direct foreign investment but also skilled foreign workers. ;.

- The high unemployment situation in the country also needs to be addressed urgently. The OECD (2013) observes that South Africa's unemployment rate, which is currently in excess of 35 percent, can be addressed by, among other things, relaxing state regulation in product markets, encouraging competitive interaction between product and labour markets, and increasing the GDP growth. These reforms in the labour and product markets will generate employment opportunities both qualitatively and quantitatively and help to entice skilled immigrants into the country. At the same time such reforms would ease xenophobic sentiments of the largely unemployed native population.

- The government also needs to employ appropriate fiscal policies, such as increased funding of social services, in order to improve the quality of its education and health sectors. Deteriorating public education standards due to poor government funding, among other things, has been blamed for the sluggish performance of the

economy and the emigration of skilled South African workers to the West, respectively (OECD, 2013; Bezuidenhout et al., 2009).

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