# THE SPATIAL DISTRIBUTION OF AFRICAN MIGRANTS IN SELECTED GLOBAL NORTH DESTINATIONS

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## DEDICATION

To those who freely provide others the chances they need, and to those who are faithful to their calling.

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*Certainly, our reach must exceed our grasp, or what else is heaven for?*

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## ABSTRACT

The uneven distribution of international migrants raises concerns, for countries with high migrant inflows, most of which are in the global north, about the efficient allocation of labour according to market demand and supply. The extant literature on socio-economic conditions and networks as major determinants of African migration patterns had not accounted for the effect of imperfect markets on the destination choices of African migrants. The literature on the role of productive markets on migrant distribution has largely not been extended to explain African migration patterns. This study was therefore designed to estimate the effects of destination markets characterised by productivity, and migration costs on African migrants' distribution in the global north, for the decades 1990 to 2010, and 2017.

The study was rooted in the New Economic Geography Theory. A Linear Gravity Model was estimated to capture the effects of destination country markets (measured by the wage potential; employment disaggregated by agriculture, industry and service sectors; size of destination economy; and networks) and migration costs (defined as distance and restrictive policy) on the volume of migration. A Helpman Agglomeration Model was also estimated to determine the cumulative effects of these destination country factors on migration. Emigration from 10 countries, which do not have a significant history of internal conflict from Africa, comprising Egypt, Morocco, Botswana, South Africa, Ghana, Nigeria, Kenya, Malawi, Mauritius and Seychelles were considered. Five previously common destinations- Canada, France, Germany, United Kingdom, United States, and five emerging ones: Netherlands, Norway, Spain, Sweden and Switzerland, were covered on account of data availability. The mixed effects technique was deployed to estimate the model based on country specific conditions. Data were collected from World Bank Bilateral Migrant Stock, the Determinants of International Migration and Organisation for Economic Cooperation and Development Statistical databases. Data were validated at $\alpha \leq 0.05$.

The size of destination countries positively increased migration between 6.0% and 15.0% indicating that larger markets were attractive to African migrants. Increased wage opportunities raised migration from Ghana 4.0% (2.7) and Botswana 7.0% (2.2). Geographical distance reduced migration from Morocco 3.0% (-3.5), Kenya 9.0% (-7.8), Malawi 9.0% (-2.8), Mauritius 7.0% (-3.4) and Seychelles 3.0% (-2.4). The influence of networks increased migrant distribution in most cases by less than 1.0% and at a higher magnitude for South Africa 7.0% (4.29) and Seychelles 6.0% (2.75). Restrictive destination country policy interventions deterred migration from Seychelles (-2.3) and Ghana (-2.8) at 3.0% each. The agglomeration of African migrants was responsive to employment in the service sector at a magnitude of between 1.0% and 7.0%, and to the wage potential at 4.0% in the cases of Egypt (5.7) and Ghana (2.0). The market potential between 3.0% and 8.0% was not strong enough to indicate core-periphery redistributions.

African migrants moved to destinations of larger geographical size, with employment opportunities, influenced by networks, but were deterred by distance, and, in exceptional cases, by restrictive policy. African countries could cooperate with destination economies to organise migrant distribution by labour market demand and supply, and to reduce migration costs.



**Keywords:** New economic geography, Economies of scale, Spatial African patterns, Migration policy

**Word count:** 499.

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| | |
|---|---|
| **AIC** | Akaike Information Criterion |
| **BIC** | Bayesian Information Criterion |
| **DEMIG** | Determinants of International Migration policy database |
| **ECOWAS** | Economic Community of West African States |
| **EEA** | European Economic Area |
| **EFTA** | European Free Trade Area |
| **EU** | European Union |
| **FE** | Fixed Effects |
| **GBMB** | Global Matrixes of Bilateral Migration Stock |
| **GILA** | Greater Ibadan Lagos Accra |
| **GLS** | Generalised Least Squares |
| **ILO** | International Labour Organisation |
| **IOM** | International Organisation for Migration |
| **NEG** | New Economic Geography |
| **NELM** | New Economics of Labour Migration |
| **OECD** | Organisation for Economic Co-operation and Development |
| **OLS** | Ordinary Least Squares |
| **OPEC** | Organisation of Petroleum Exporting Countries |
| **RE** | Random Effects |
| **SSA** | sub Saharan Africa |
| **UN** | United Nations |
| **UNECA** | United Nations Economic Commission for Africa |
| **UNDESA** | United Nations Department of Economic and Social Affairs |
| **UNHCR** | United Nations High Commissioner for Refugees |
| **UNCTAD** | United Nations Conference on Trade and Development |
| **WB** | World Bank |
| **WDI** | World Development Indicators |

## GLOSSARY OF TERMS

**Africa-10:** African countries selected in this thesis, because they are representative of economics in the continent with voluntary migration patterns. These are two per geographical region and two Islands. They are Egypt and Morocco; Botswana and South Africa; Ghana and Nigeria; Kenya and Malawi; and Mauritius and Seychelles.

**Core destinations** mean leading destinations for African migrants, they top the list of migrant stock from Africa, they are denoted OECD-5 and are Canada, France, Germany, United Kingdom, United States of America

**Documented migrant** is one who enters a country through one of the regular channels

**Emerging destinations** are those to which in the case of at least one of the African countries examined, migration to that destination commenced after 1980.

**Global north** refers to the northern hemisphere of the world

**Gross migration** refers to all moves or all migrants, within the specific definition of migration that is being applied.

**International migrant stock** is the number of people born in a country other than that in which they live. It also includes refugees. The data used to estimate the international migrant stock at a particular time are obtained from population censuses. The estimates are derived from the data on foreign-born population-people who have residence in one country but were born in another country. When data on the foreign-born population are not available, data on foreign population, that is, people who are citizens of a country other than the country in which they reside--are used as estimates

**[International] Migration flows** data capture the number of migrants entering and leaving (inflow and outflow) a country over the course of a specific period, such as one year.

**Migration corridor** is a set route that significant number of migrants follow from one area to another

**Migration rate** is the number of migrants (or the number of migrations) related to the population that could have performed the migrations during the given migration interval.

**Location effects** refers primarily to productivity that results from economies of scale

**Migration stream**[1] is the total number of moves made during a given migration interval that have a common area of origin and a common area of destination. In practice, it is usually a body of migrants having a common area of origin and a common area of destination.

**Net-migration** is the balance of movements in opposing directions. With reference to a specific area, it is the difference between in-migration and out-migration. If in-migration exceeds out-migration, the net gain to the area is classifiable as net in-migration and takes a positive sign.

**OECD-5** are the core destinations in the global north for African migrants as identified in this thesis namely: Canada, France, Germany, United Kingdom and United States

**OECD-N** are emerging destinations in the global north for African migrants, as identified in this thesis namely: Netherlands, Norway, Spain, Sweden, Switzerland

**Refugee** a person outside of their country of nationality who is unable or unwilling to return because of persecution or a well-founded fear of persecution on account of race, religion, nationality, membership in a particular social group or political opinion (United Nations Convention 1951)

**Spatial Distribution** is the arrangement of migrants across the world. It describes the relationship between migration and spaces between which it occurs.

[1] http://www.un.org/esa/population/pubsarchive/migration_publications/UN_1970_Manual6.pdf

**Turn-over** with respect to a given area, the sum of in-migration and out-migration, or of in-migrants and out-migrants, is turnover.

**Unauthorised migrant** one who enter a country illegally or violates their terms of legal entry, in this thesis interchanged with irregular, undocumented migrant, also described in this thesis as undocumented or irregular migrant.

**Voluntary migrant** one who migrates for economic reasons and is not under the category of forced migrant. They include naturalized citizens, humanitarian migrants [people granted temporary migration status], lawful permanent residents [employment-based, family sponsored, unauthorized allowed to become LPRs under special, international adoptions], temporary migrants [students, scholars or trainees, temporary workers].

# CHAPTER ONE

# INTRODUCTION

## 1.1 General Introduction

Economists, since Alfred Marshall, recognised the benefits of location on productivity, but a deliberate discussion of migration in space deserves more attention in economics. Voluntary migrants are motivated by better potential quality of life extending from economic reasons such as efficient markets for their capabilities to political, environmental, and social motives, including closeness to family. However, the germane role that location plays in destination choices deserves central attention, considering the fact that countries with similar socio-economic conditions do not attract the same proportion of migrants. In addition to inspecting the role played by networks in perpetuating migration patterns, it is equally pertinent to ascertain the extent to which location benefits migrants, especially how efficiency of labour affects migrants' persistent destination choices.

The United States tops choice destinations, with 46.6 million immigrants, out of which two million are Africans according to the International Organisation for Migration (IOM, 2018); following, albeit not so closely, is Germany (12 million), then Russia (11.6 million). Indeed, two-thirds of all migrants live in twenty countries, while the top eight destinations are in the Organisation for Economic Cooperation and Development (OECD)[2] region (United Nations Statistical Division

[2] The 36 current member countries of the OECD are Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States.

(UNSD), 2013), which are all global north countries.[3] Similarly, two-thirds of all migrants live in Europe (UNSD, 2013). There is also an increase in migration from middle income economies as classified by the United Nations. Six out of ten international migrants were born in a middle-income country, in contrast with fewer than half from the same class of source countries in the 1990s (Connor, Cohn and Gonzalez-Barrera, 2013). There has furthermore been a steady increase in the number of migrants going outside previous core destinations (Kobazar *et al,* 2015). A primer of the more recent migration situation suggests that regions with fewer established network connections to Africa, such as the Netherlands or part of the Scandinavian region, are getting more African migrants than previously (World Bank, Global Bilateral Migration Database (GBMD), 2018). Consequently, it is necessary to carry out a fresh examination to clearly establish the cause of the recent rise in migration to emerging destinations. Aside that, it is equally important to investigate how natural barriers to migration and other forces such as receiving countries policy change affects migrant stock.

Migration from Africa remains mostly within the continent, for instance, for Western Africa (89.2%), Eastern Africa (88.7%), Central Africa (84.1%), although less so from Southern Africa (55.8%), whereas only Northern Africans are migrating more out of the region at 50.4 per cent (Shimeles, 2018; United Nations Conference on Trade and Development (UNCTAD), 2018). At the same time, Africans have been moving further distances, within and outside the continent (Shimeles, 2018) and migration between the developing and the developed countries, which had been stable up until 2000, is now growing at the fastest rate ever (Ozden, Parsons, Schiff, and Walmsley, 2011). Migration rates from Africa in order of magnitude are intra-regional (68%), OECD (25%), non-OECD (3%), other developing countries (2%) and unidentified (2%) (World Bank, 2011). According to the UNCTAD (2018) the most significant migration corridors in Africa are, in order of magnitude, between, the Burkina Faso and Cote d'Ivoire (1.3 million in migrant stock); South Sudan and Uganda; Mozambique and South Africa; Sudan to South Sudan; and as we had seen earlier a bilateral corridor between Cote d'Ivoire to Burkina Faso; Somalia to Kenya; Somalia to Ethiopia; South Sudan to Ethiopia; Benin to Nigeria; Mali to Cote d'Ivoire; Zimbabwe

[3] In the 1980s, the Brandt line became a way to indicate the geographical split between relatively richer and poorer nations

to South Africa; Sudan to Chad; Uganda to Kenya; Lesotho to South Africa; and South Sudan to Sudan.

The share of migrants within Africa declined by seven per cent between the period of 2010 and 2017, at the same time, there was an increase of six per cent (420 000) and four per cent (325 000) of sub-Saharan Africans (SSA) living in Europe and the United States (Connor, 2018). Migrants from sub-Saharan Africa to Europe also grew by 31 per cent in 2017 compared to 2010 (Connor, 2018). Migration out of Africa tends to cluster around a few countries. For instance, 37 per cent are in the Unites States, 10 per cent in Germany, six per cent each in Canada, France, Spain and the United Kingdom, five per cent in Australia and four per cent in Italy (World Bank, 2009). Other countries outside Africa share the remaining 20 per cent, with less than two per cent each (World Bank, 2009). There were about 21 million Africa migrants living in the OECD as at 2010[4] or 10 per cent of total migrant stock there.

One common explanation for migration patterns has been its association with underdevelopment. Despite that, it is still imperative to comprehend to what extent underdevelopment has resulted into migration, since it continues regardless of the development stage of a country. Moreover, the focus on a nexus between migration and development has relegated the role of markets to the background, in addition to neglecting that migration continues even amongst countries with similar levels of development. The alternative, labour market mechanisms suggest that migrants move away from locations where they are less productive implicitly towards those places that allow them to work and earn efficiently (see for example Todaro, 1976).

A significant number of people are international migrants, 244 million in the world (IOM, 2018). Whereas, their absolute number is rising annually, and has grown by 41 per cent since 2000, their relative number, that is, migrants per population, is rising by less, from 2.9 per cent in the 1990s to 3.1 per cent in 2014 (IOM, 2018). The United Nations Department of Economic and Social Affairs (UNDESA) reports African migrants make up 14 per cent of world migrations compared to 41 per cent from Asia and 21 per cent from Europe (UNDESA, 2017). Women comprised less

[4] The Defoort Database is based on six of the major receiving countries United Kingdom, United States, Germany, France, Australia and Canada. Defoort, C (2008) Emigration rate of tertiary educated workers. Population, Vol. 63 No. 2 pp. 285-318.

than half (47.1%) of the overall value in 2017, having risen from 46.9 per cent in 2000 (UNDESA, 2017).

The United Nations Department of Economic and Social Affairs (2017) report shows that 68.5 million people are forcibly displaced [otherwise, involuntary migrants], while 25.4 million of these are refugees more than half of whom are under 18 years, 10 million are stateless; others include unauthorised migrants. The forcibly displaced come from three major countries that are also experiencing economic and political distress: South Sudan (1.4 million), Afghanistan (2.5 million) and Arab Syria (5.5 million) migrants. In comparison with 1990, when about half of African emigrants were refugees, in 2013 the values declined to about ten per cent (Gonzalez-Garcia *et al,* 2016).They are often provided for through humanitarian measures rather than the direct focus of labour market policies. A proportion of involuntary migrants, transit into the labour market, subsequently, becoming lawful residents, absorbed through integration or human rights programmes.

Initiatives at treating transitions between voluntary and involuntary migration under a mixed migration framework are just developing. This complexity contributes to theory and policy, which currently distinguishes clearly between involuntary and voluntary migrants. While mixed migration exploratory approaches have been set up by various agencies such as the United Nations, the practice of separating the data and conceptual definitions are still unclear. An attempt is made at simplifying complex migration scenarios in order to focus on how voluntary [economic] migrants, through regular channels, might choose their destinations. Another migrant population group is the undocumented migrant, a category difficult to capture in statistics since inherently many are hiding.

Approximately 97 per cent of people [and a lower proportion of birds, beasts, and fish] do not migrate internationally. These belong to a category of migrants known as stayers. Despite the forces of migration, in many African countries, where there is no compelling need to migrate, such as war, stayers appear to adapt rather than join the *birds of passage*. Stayers weather almost any difficulty, especially if they have estate or other immovable heritage that are dear to them. They may enjoy amenities such as good weather or national food and cultural practices or lack the

financial means or skills to move. Stayers fit a wide array of possibilities, including the proverbial Herod, happy to make decisions from the comfort of his palace.

The focus of this thesis on economic documented migrants allows for proactive and measurable information about voluntary migration at origin and destination countries. This thesis sets out to explore migrant spatial distributions as a response to markets and costs of migration, including the effects of restrictive policy. Its results could be useful to destination countries since understanding migrant destinations can signal whether policies will become effective [dis]incentives. It concentrates on how African countries can understand migrants' destination choices, in a bid to encourage initiatives that optimise migrant choices vis-à-vis source and destination country needs. Origin and destination economies can take initiatives towards optimising migrant choices, as they better understand how decisions about where migrants go to, could be space specific.

## 1.2 Statement of the Problem

Migration is a natural phenomenon, occurring across various markets. The United Nations High Commissioner for Refugees (UNHCR) reported that six out of ten migrants move for economic reasons;[5] indeed 4.4 per cent of all workers are migrants (UNHCR, 2017). Migrants also tend to identify a destination, and then cluster there. Indeed, about half of all international migrants live in ten countries (OECD, 2013, UNDESA, 2017). Even though migration is primarily between countries within the same region, yet by 2017, the number of international migrants originating from Africa experienced the highest increase of 68 per cent (UNDESA, 2017). While this is a rise from 1.8 to 2.0 per cent of international migrants from Africa as a percentage of the total population, the increasing migration out of the continent presents an evolving landscape in African migrant distribution. In point of fact, the highest growth from Africa remained towards a core destination, Northern America at 4.9 per cent or 1.5 million migrants (UNDESA, 2017). Much remains unanswered about the persistent destination choices of African migrants and evolving migrant distributions.

The migration literature on Africa focuses on drivers of African migration such as the poor economic conditions at origin, especially following demographic pressures, unemployment and

[5] Voluntary migrants sometimes called economic migrants include all those who have moved as a result of their own desires and motivations (Hansen, 2003).

declining socio-economic conditions (Fadayomi 2010; Adepoju, 2017). These studies imply that migration would reduce with improving socioeconomic conditions at origin, yet the literature is divided on how this happens, and migration between countries with similar economic conditions remains significant. So, factors responsible for the destination choices by African migrants remain inadequately explained. Moreover, when income differentials drive migration, it is expected that through redistribution in supply of labour, over time, those differentials would decline (for example see Williamson, 1995). However, this convergence is far from the reality for Africa in relation to the industrial world.

The predominant explanation on African migrant distribution is that networks perpetuate migrant clusters following colonial, language and similar ties (Adepoju, 2008). Also, the feedback mechanisms through which migrants persistently choose certain locations have been distinctively examined through the distribution of labour across markets with established network (Adepoju and van der Wiel, 2010; De Haas, 2011). These network models are able to capture complex interactions between migrants and potential ones, as well as between a network of connected countries (see Tranos *et al*, 2012). While it has been observed in the previous literature that migrants tend to cluster at core destinations, there is an emerging migration transition to new destinations, associated with markets, population growth and socio-economic factors (see Flahaux and De Haas, 2016). Nevertheless, this transition is unexplained by previous migrant networks, neither have the dynamics in destination choices in the northern hemisphere of the world been adequately considered, even though it highlights the importance of international migration from Africa.

Consequently, given the unexplained redistribution of labour between Africa and the global north, this thesis takes advantage of methodological advances associated with Helpman (1998) in modelling increasing returns to scale to compare market characteristics among African migrant destination countries. It questions whether the features of destination locations affect the role markets play in migrant destination choices. The Helpman (1998) type methodology allows a complementation of the previously emphasised culture, language, and similar attractions that explain migration patterns. In addition, this research aims to examine how other migration costs such as distance, and restrictive policy affect migrant distributions within this market framework. The premise on the transformation of migrant distributions is that policy in addition to distance

affects the accessibility of markets and therefore the costs of migration. It also sets out to explore whether the market potential at the destination outweigh those costs in migrants' selected destinations.

Given the aforementioned then, the main focus of this study is to explain the evolving spatial patterns of migration from Africa. The thesis answers three research questions: What determines African migrants' destination choices? How do migration costs affect African migrants in their choice of destination? Do initial migrant clusters, through location specific effects, perpetuate migration distribution in a particular space?

## 1.3 Objectives of the Study

The broad objective is to critically analyse migration distribution originating from African countries towards selected destinations in the global north. Specifically, the thesis aims to:

1. determine the association between distribution of migration from Africa and destination market conditions under varying degrees of productivity;
2. examine the role of migration costs in African migrant destination choices; and
3. ascertain any cumulative impacts of market forces arising from the location of markets on the distribution of migrants from Africa in the global north.

The null hypothesis to be tested are:

1. There is no significant association between migrant distribution and location specific destination market conditions
2. There is no significant relationship between migration costs [absence of networks, distance and policy restrictiveness] and migration from Africa
3. There are no cumulative impacts of market forces strong enough to determine a redistribution of African migrants towards economies in the global north

## 1.4 Justification of the Study

In terms of theory, from the numerous explanations on the distribution of migrants from Africa; three strands prevail. The predominant macroeconomic perspective focuses on attractive economic conditions at the destination, particularly wage differentials, that would adjust with migration,

under perfectly competitive conditions (Borjas, 1989). The microeconomic framework that dominates the literature, is Borjas' (1989) explanation about individuals evaluating fluctuating economic conditions and opportunities and deciding to migrate once perceived benefits exceed costs. Meso frameworks, such as Stark's (1991) also attempt to combine macro and micro economic perspectives, emphasising the role of investment strategies of households. All these however, focus on how migrants choose their destination, that is, determinants, subsuming where they go to (patterns).

A direct explanation of where migrants go is that building on an initial contact, networks of migrants (Castells, 1996) strengthen the attraction to location by sharing information and even pooling migration expenses. African migrants, it has been empirically shown, cluster where colonial, language and cultural connections exist (Adepoju, 2006; Gonzalez-Garcia *et al*, 2016). Networks also describe migrants building on an initial affinity with the destination, and potential migrants rely heavily on information shared by their network, that could encourage or deter their attempts to migrate to the same destination.

The network theories explain that existing migrants perpetuate migration patterns. However, it can be noted that networks do not operate in isolation of markets. Moreover, there is growing evidence that migration patterns are shifting towards destinations outside those with previously strong networks (see Czaika and de Haas, 2013). The continual concentration on networks in its traditional sense of historical ties, has then not adequately presented how African migrants choose new destinations. It is in this regard important to extend the appraisal of how these established determinants of migration patterns namely: networks, transportation costs, and policy to an examination of their interactions within a market framework. This research, therefore, contributes to the theoretical literature by considering the location of markets as a spatial benefit attracting workers to a destination and migration costs as closely associated with destination market conditions.

In terms of methodology, this thesis takes advantage of recent advances in modelling migrant distributions coming from Helpman (1998) to look at how links to location are changing and the role markets play in migrant destination choices relative to previously emphasised cultural, language and similar attractions. Studies addressing the recent distributions of migrants from

Africa, focus on modelling the location choices of migrants based on distance, intensity and spread (Makinwa-Adebusoye, 2006; Czaika and de Haas, 2013), leaving market location out. This thesis argues that the neoclassical migration theory assumption of constant returns to scale is deficient in describing African markets in relation to the industrial core, so that rather, migrant destinations are characterised by productivity. Likewise, even though the literature models mechanism through which the market-pull extends across geographically distant locations (Coniglio, 2002), but these researches have not been applied to African migrant distributions, which are affected uniquely by distance from the industrial core and restrictive policy. The more econometrically robust studies on spatial response of migrants to regional markets have concentrated on the European Union (Hanson, 2001; Crozet, 2004) or across states within the same country, as in the United States (Gonzales *et al*, 2011). Furthermore, the discourse on distance focuses on regional integration versus globalisation, with too little attention to the evolving mechanisms through which falling transportation costs may transform migrant distributions. Transportation costs associated with distance are improving with technological advancement (see Lafourcade and Thisse (2008); this is examined in this thesis. Furthermore, this research is unique in its approach to converting restrictive policy interventions into measurable indicators of African migration patterns.

Regarding empirical relevance, it extends the evidence on the redistribution of African migrants to productive destination markets. Africa remains unique for empirical evidence about distribution of labour migrants from distant locations, vis-à-vis destination country market conditions and migration costs. There is also a dearth of quantitative evidence on the impact of destination country policy on migration from Africa. Moreover, to what extent does market attraction outweigh these migration costs, particularly where wages and employment opportunities differ significantly? This thesis examines the empirical support for the degree to which market forces and migration costs explain the spatial distribution of migrants from Africa in the global north.

Accordingly, explaining the spatial distribution of migrants is a prerequisite to understanding their destination choices, and explicitly in evaluating any persistence in concentration at [destination] markets or dispersions therefrom. This broadly may encourage coordinated migration policy between sources and destinations that takes advantage of optimising the variations in abundant and scarce resources. It may also inform policy responses to increases in distribution of migrants between certain source and destination economies, such as incentives to scarcely sought

destinations and disincentives from agglomerated ones. The economics of voluntary documented migrants directly translates to labour market policy coordination between destination and source economies, unlike forced migration, which is interwoven with humanitarian approaches. In practice, a study on voluntary migration informs labour market and labour migration policy and can improve migrant destination choices.

## 1.5 Scope of the Study

Migration in this essay, describes various degrees of liberty and willingness to move across regions through documented channels, a strict concentration on regular international migrants. It is assumed that migration is voluntary and tautological for economic reasons, even while it is recognised that migrating following economic constraints itself signals some degree of missing freedom.

This thesis embarks on an examination of voluntary, documented, migration between ten (10) selected African countries (Africa-10) and ten selected countries from the global north, which happen to be members of the Organisation for Cooperation and Development (OECD-10) over the period of 1990 to 2017.[6] The OECD-10, include five recognised common destinations for African migrants (OECD-5), namely Canada, France, Germany, United Kingdom and United States, also referred to as core destinations.

The other five are emerging destinations for African migrants (OECD-N) namely Netherlands, Norway, Spain, Sweden and Switzerland. These emerging destinations have been determined from descriptive analysis of migrant stock to the OECD.[7] While there is an attempt to neatly separate the core destinations, from emerging ones, not all the latter can be new to the same set of African countries at the same time. There are exceptions, for instance between Ghana and Netherlands, which commenced only in the 1980s or migration between Morocco and Spain that has been significant in magnitude even before the latter became a net receiving economy in the 1990s. The

[6] The United Nations defines developed regions as those within Northern America, Europe, Japan, Australia and New Zealand. The OECD includes 34-member countries considered the most advanced although three members are emerging economies namely, Mexico, Chile, and Turkey. Only two countries are outside the UN developed country category but OECD member states, these are Mexico and Israel.

[7] Please see appendix 1 and 2 tabulating stock of migrants by destination choice from which the thesis selects emerging destinations of African migrants.

thesis introduces a database of determinants of international migration policy, which will be used to estimate the impacts of policy on African migrants.

The choice of Africa as the region of origin for the study is because most African countries are in relation to other continents, relatively geographically distant from the industrial core and this can help us understand migrant redistribution within a core-periphery situation. Implicitly, Africa is comparatively less industrialised. Geographical distance is decreasing in terms of transportation and other transactional costs as a result of advancement in technology and these are important factors affecting the distribution of African migrants. This fits our aim to examine global south-north migration within a market framework rather than focus on levels of development.

The Africa-10 are selected, after examining the World Bank GBMD (2018), which revealed that they are well known sources of labour migration to the global north; while the African countries for which conflict and other involuntary factors feature in their patterns of migration have been left out. They are not included because their migration patterns would characteristically be associated with forced movements. Two African countries are selected per geographical region;[8] in Southern Africa, Botswana and South Africa are selected; in Northern Africa, Egypt and Morocco; in the East, Malawi and Kenya; and in the West, Ghana and Nigeria are picked. In addition, two outliers with a history of significant emigration rates, serve as controls, these are Seychelles and Mauritius islands.

In addition to income, it is known that migration patterns are associated with networks and cultural proximity (Adepoju, 2010).[9] The Africa-10 also accounts for a variation in geographical and cultural proximity to control for some network effects. The OECD is a representative region since countries that migrants from Africa go to are in the OECD region (see World Bank, 2018).

Notably there are other types of migration outside the scope of this study[10]because they require a different framework of analysis. They include involuntary/forced migration (persons fleeing

[8] The regions are as defined by the World Bank South, North, East and West Africa.

[9] With the exception of France, where Algerians, Moroccans and Tunisians migrate to predominantly, given language associations, migration patterns in Northern Africa are consistent with those described in Adepoju (2010).

[10] More recent forced migration data including refugees are captured by the United Nations High Commission for Refugees but are not part of bilateral estimates of migrant stock. Some level of irregular migration data is also available but not included in the GMBM this thesis adopts. All results will therefore be interpreted to include only documented migrants.

conflict, internally displaced persons), refugees and asylum seekers, and other undocumented[11] migrants such as victims of human trafficking, and others with irregular entry, residence, or employment. The latter cross the border voluntarily but without proper documentation of their legal rights to be at the destination country. The fraction of irregular migrants has been estimated to be up to one-third of all migrants to developed countries (IOM, 2013).

Of particular relevance is mixed migration, which the IOM defines as complex population movements including refugees, asylum-seekers, economic migrants and other migrants' who often move irregularly (IOM, 2011). It is acknowledged that migrants often shift motivations transforming from economic to irregular, which does not hitherto exclude migration for economic reasons, and asylum-seekers may eventually enter into the labour market. The trouble is that theory and policy have treated these categories as distinct, thus it is beyond the scope of this study to overturn this neat categorization that remains useful for research. The thesis is further bound by the bureaucratic and legal conceptualisation of migration statistics into voluntary and involuntary that is beyond its scope to do away with.

There are also destinations for migrants from the global south, outside the global north and indeed in absolute values, south-south migration is the largest at 82 million or 36 per cent, followed by south-north (35%), north-north (23%), north-south (6%) (Martin, 2013). South-south migration values for Africa capture its significant regional migration patterns. Yet what is being examined is the extent to which migration costs may be affecting African migration patterns and for the period in question, south-north migration from Africa is important, particularly because we see preconditions regarding the mobility of labour that require exegesis. These demand further scrutiny, particularly because recent evidence indicates that migration patterns require explanations beyond simple push-pull mechanisms (see Czaika and de Haas, 2013).

Finally, the thesis employs the migrant stock variable. While mobility patterns could be in chains where migrants move regionally initially and then later to farther destinations or involve return/circular migration, this thesis does not directly capture such patterns. Further, outsourcing

[11] Undocumented/irregular migrants are pejoratively referred to as illegal immigrants/aliens, but as de Haas (2010) points out, most migrants are not criminals. For correct terminology in migration studies see Global Commission on International Migration report (IOM, 2005) Migration in an interconnected world: New directions for action. Report of the Global Commission on International Migration: Geneva.

over the internet and similar technological advances that allow services to be transferred without migration are not covered. Moreover, there are various motivations for migration from Africa to the OECD, including leisure, vacation, touristic purposes, temporary work, study, which are not differentiable in the migration stock variable. This means that whereas there is an interest in labour migration, it cannot be pursued strictly. The interest examined in this thesis remains on whether documented economic migrants systematically go to certain locations in the global north or choose newer locations and why they do so.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Migrant distribution in equilibrium theory

This chapter presents a review of the theories, the research methodology, and empirical studies on migration and migrants' distribution. This research approaches the subject from an equilibrium – disequilibrium comparison. Five migration theories are detailed namely: the neoclassical migration theory, network theory, new economics of labour migration, world system's theory, and new economic geography theory. In addition, necessary supporting principles such as Ravenstein's laws of gravity, push and pull factors, dual market models, human capital model, the migration hump hypothesis as well as methodological non-linear models are discussed in relation to those theories.

The cornerstone of principles governing migrant distributions is Ravenstein's (1885; 1889)*gravity laws*, a set of eleven reliable propositions distilled from census data of England and Wales. Ravenstein remains pertinent since his predictions on the distribution of migrants have been applied to a space [regions] and time outside his sample size. He is the first to postulate that migration is voluntary, motivated by economic reasons, and related to distance between countries and population [density] of both the sending and receiving country (Skeldon, 1997). Conceptual differences on the contemporary use of distance have been emerging in recent decades. It has been argued that the efficiency in transportation technology reduces the cost of transportation, which is

increasingly influenced by demand forces over actual kilometres (see Lafourcade and Thisse 2008; Schmutzler, 1999). Yet geographical distance maintains its relevance in migration patterns as documented in African regional migration rates (see Krugman, 1991). Similarly, Ravenstein's prediction that migrants mostly move short distances is reflected in the same evidence of regional higher migration volumes compared to global migration (see World Bank, 2011). As regards African migrant distribution, Adepoju and van der Wiel (2010) observed that migration follows in steps, allowing the migrant to transit from large disparities in living standards.

These *few long-distance migrants* [today approximated at about three per cent] (IOM, 2018), according to Ravenstein, indeed are moving towards industrial and commercial cities. His principles describe the dynamics of a spatial distribution equilibrium, which becomes stable once the underlying differences between destination and source are balanced. Following this, Ravenstein's principles imply a one-way traffic towards the global north; however, migration is more complex including significant movements between countries with similar levels of development. Aside that, Ravenstein gravity type predictions are also less reliable because they cannot account for the description of large towns' growth resulting more from migration than natural increase.

Exceptionally, some anecdotal cases such as Canada and Europe's population difficulties suggest a need for further assessment of Ravenstein's principles. Finally, that females are more migratory than males, was not reflected in the documented migrant evidence, where after the recent catch up in gender disparities, there are still about 48 per cent of all migrants who are female (UNDESA, 2015). One of the Ravenstein principles that resonate strongly with the concern of this thesis relies on the process of dispersion from one place and its inverse absorption into another, where people from a rapidly growing town migrate into it.

Stouffer's law of intervening opportunities (1940) contributes to the discourse on migrants' destination choices for it states that they make active comparisons of various locations driven by expectations of settling down at those countries. The emphasis is on destination country conditions, not Ravenstein's distance and population, in a manner similar to Lee's (1966) later conceptualisation of pull factors. Stouffer's characterisation of migrants is quite a contradiction as they are assumed to behave as stayers, as if migration is a one-time event that is settled once the

migrant finds the right conditions. That feature of migrants is not supported in the migration literature where migration is noted to occur stepwise and cyclical, initially at a closer distance then migrants move farther away, or by the knowledge that migrants move between countries with similar economic conditions (for example see Adepoju and van der Wiel, 2010). In addition, since migrants respond to destination countries' opportunities, then migration should decline as markets in destination countries become saturated, yet such neat equilibrium is absent in migrants' distributions (de Haas, 2008).

Lee's push-pull propositions describe more thoroughly migrant distributions as a result of both origin and destination countries' economic conditions. Lee assumes temporary market distortions but once migration commences, he relies on equilibrium over time. That is, market differences between source and destination economies that prompted migration converge over time. Lee's principles remove the emphasis from distance, while retaining it as a repelling economic force, alongside other economic, social, and political factors at the source economy that drive the migration. The list of available opportunities in Lee is limitless and affected by individual migrant characteristics. There are four levels of factors that affect migration: factors associated with the origin area; factors associated with the destination area; intervening obstacles [including policy barriers and migration costs]; and personal factors.

In practice Lee's principles are often used to describe the attraction of better economic and other conditions at the destination, using measures such as real wage differentials, which encourage migration as long as they persist. Lee also identified that opportunities tend to be localised, and feedback from destination facilitates future migration (de Haas, 2008). These localised opportunities are similar to Ravenstein's description of commercial and industrial centres and explains why migrants persist in seeking greener pastures. However, the list of push factors is arbitrarily determined, for instance the demographic pressures of population density should direct migration towards less densely populated cities, but dense population is an inherent characteristic of industrial cities. Despite these difficulties the model raises, it was Lee (1966) who first pointed out that reverse information facilitates spatial clustering of migrants (de Haas, 2014: footnote).

### 2.1.1 The Neoclassical Migration Theory

Earlier neoclassical labour migration theory had assumed that individuals migrate to optimise their benefit in response to wage differentials. That is, from an initial equilibrium, if some shock to an economy resulted in wages becoming lower in one region than in another, then labour would move to where earnings were higher. This would persist, until adjustments in the supply and demand of labour equalised wages once again across the two regions. Labour would move out towards where it is scarce, reducing wages at the destination while wages would rise at the origin country of migration (see Thirlwall, 2011). Labour is mobile and migration costs are assumed to be negligible. Also, migrants are assumed to have perfect information about destination conditions and even the costs and benefits of migrating (Thirlwall, 2011).

The neoclassical migration theory attributed to Todaro (1969) offers a plausible explanation for the gap in migration theory that does not allow an accurate prediction of the volume or direction of migration. Todaro's (1969) contribution is to relax the perfect information assumption using the idea of expectations about destination country conditions. This explains how migration continues in the face of worsening economic conditions at the destination that previous theories could not account for. The microeconomic migration theory essentially discusses determinants of migration and like other equilibrium theories; it simply assumes that the direction is away from poorer economic conditions towards better opportunities (Thirlwall, 2011). This prediction has contributed to the misconception that migration is a developing country problem.

The neoclassical migration theory further built on the depictions of Sjaastad's (1962) migrant, who weighs investment in human capital in his decision to migrate. Borjas' (1989) extended Todaro's (1969) work on rural-urban migration to international migration. While Sjaastad's human capital model assumes migration decisions are economic, Borjas' extension showed individuals weighing additional costs including transport and psychological costs, such as the stress of separation from home against expected benefits of improved living conditions. The rational individual would then migrate as long as expected benefits outweighed costs. The migrant conceptualised in the neoclassical and human capital frameworks is the one whose human capitals (education, occupation, skills, age) are potentially rewarding and expectations continue to drive the decision to migrate.

In neoclassical macroeconomic concepts where worker's skills augments labour productivity, migration was seen as a loss, particularly of skilled workers, for the sending economy as far back as Grubel and Scott (1966). These conclusions have more recently been anchored on the *exogenous (Solow-Swan,[12]1956)* and *endogenous growth models* (Lucas, 1998; Romer, 1990) where output is affected by technology, therefore, a loss of physical or human capital decreased production per worker; the converse holds. It must be noted that a concentration on the macroeconomic impacts of migration underplays the individual choices and benefits. A concentration on macroeconomic impacts negates that voluntary migration is assumed to be for economic reasons, so the individual migrant expects to be better-off by moving, and it does not account for aggregate impacts (for example Borjas, 1989).

Essentially, these macroeconomic theories are useful in measuring the impact of migration on the sending economy rather than the distribution of migrants, although Barro (1995) type macroeconomic models predict convergence of growth that affects the direction and implicitly patterns of migration. Unfortunately, catch up on macroeconomic differences between global south and north has been elusive for decades, against the predictions of migration frameworks that rely on equilibrium.

In summary, three instances question the predictions of equilibrium of neoclassical migration theories. First is the case where real wage disequilibrium is rising but migration per population is increasing less significantly, particularly in the Africa to OECD dichotomy. Second it does not capture how migrants choose between destinations with similar conditions. Finally, the contradiction of theories that rely on human capital channels, is that if workers do accumulate human capital, why do they not impact the markets they live in when faced with intervening obstacles?

### 2.1.2 The Theory of Networks

The theory of networks is the earliest explanation on why migrants are not evenly distributed at destinations with similar conditions. Castells' (1996) work expanded the possibilities in

[12] The exogenous growth model is credited to Solow, R.M. (1956) and Swan, T.W. (1956), also simply referred to as the Solow model

application of networks to migrant distributions. The key strength of the network theory is the complexities by which economic, social, and psychological migration costs can be affected by already existing links to the destination. Castells' (1996) pertinent contribution to recent network theory lies in his assumption that technological advancements in information technology contribute fundamentally to connecting society. Castells moved network theory away from assumptions that social connectedness has a centre of gravity; in his depiction, networks had no centre.

Networks have three properties: they are *flexible* to changing environments, they can expand or reduce to *scale* with little disruption and because they have no centre, they *survive* within a wide range of configurations (Anttiroiko, 2017). Networks are a form of social organisation and connection nodes that shared information remained in existence. Castells (1996) also extended the applicability of networks by rejecting information and knowledge as primary variables, and representing interconnections by a binary logic of inclusion or exclusion. A network node is kept active if it serves its information sharing function, that is, nodes were utility dependent (Anttiroiko, 2017). As a result, migration is path dependent, and cumulative, that is, it accelerates even if inter-regional differences in income start to converge. Networks frameworks have benefitted from transnational space theories (Carling, 2003) in which activities are developed in various *spaces* such as citizenship, national language policy, voting rights of [diaspora] citizens with a strong connection to their country of origin and partial detachment from the destination.

Migrant clusters are the thrust of network theory explaining institutional arrangements, particularly, the influence of diaspora, colonial ties, trade and investments flows that perpetuate migration as open ended. Network theory in this way captures location specific characteristics, a relational space that facilitates migration of others, a knowledge mobilising space that connects and historical space that allow migrants to maintain multiple loyalties between origin and destination. Networks also help to confute misunderstandings about migration in relation to living conditions given their assumption of path dependence and the cumulative property. However, network theory is strong in explaining persistent migration only after the first flux of migrants. It relies on identifying factors that precipitated the initial migration, with a long list of possibilities. Indeed, any intervening opportunity is a potential for a cluster of migrants to form at a destination. That means that when patterns of migration are changing, there is a need for a different framework

to first identify what precipitated the change. Thus, theories of determinants of migration are a backdrop to network theories.

In the set of transition hypothesis, Zelinsky (1971) avoids the prediction error on migration patterns between similar destinations by looking at their distribution in relation with changes in socioeconomic conditions. He proceeds from Skeldon's (1997) five developmental tiers '(1) old and (2) new core countries characterised by immigration and internal decentralisation; (3) the expanding core (e.g., eastern China, South Africa, eastern Europe), where we find both immigration and out-migration and internal centralisation (i.e., urbanisation and rural-to-urban migration); (4) the labour frontier (e.g., Morocco, Egypt, Turkey, Mexico, the Philippines, and, until recently, Spain and Portugal), which are dominated by out-migration and internal centralisation; and the so-called (5) "resource niche" (e.g., many sub-Saharan African countries, parts of central Asia and Latin America), with variable, often weaker forms of migration' (see de Haas, 2014). He then describes the patterns of migration as rising initially as economic development improves and declining after a period of this socio-economic well-being; therefore, having a J or inverted U type shape.

Skeldon's (1997) idea is weak in the possible interpretations for each classification of development tiers; as well as in generalisations such as resource niche. The latter weakness lies in the circularity of the argument, whereas a claim that migration patterns change is then met with categories that are themselves dynamic. The resource rich classification also, is hardly a permanent label. Yet there is some purpose to be borrowed from Zelinksy's (1971) affirmation, that is, the disassociation of migration from development problems. Massey (1999) attempted to solve this challenge of determining whether it is the demand or supply side that prevails. As a result, he introduced migration as initially determined by capitalist factors, market failure and structural problems like cumulative causation and social networks, but at later stages of emigration, wage differentials and labour market conditions dominated. The static analysis problem of determining dominant factors however remained unsolved.

De Haas (2014) synthesises the set of migration transition hypothesis from Skeldon (1997), Zelinsky (1971) and the migration hump hypothesis. He then makes a strong attempt to dissociate migration from a development failure paradigm according to the migration hump propositions.

However, De Haas (op cit.) is able only to move forward to what level of development leads to which form [sic.] of migration. Yet a focus on levels of development, rather than a return to Ravenstein proposed concentration on commercial and industrial activities, cannot answer the question of migration among countries with similar economic conditions or increasing migration in the face of improving economic conditions (see de Haas, 2014) as observable in Africa, where middle income status of a country is associated with higher migration stock. The simplest rationalisation is that for economists, development is not a simple condition to capture. The more problematic reason is that associating migration with various levels of development is circular reasoning, since if all we can say is that migration continues indifferent of development, then we cannot say that migration is determined by development *per se*. The circularity of the postulates means it cannot be inferred that development levels are drivers of migration but some other factor[s] inherent in the conceptualisation of development.

Consequently, it is patent that de Haas (2014) was right in his observations using the migration hump hypothesis that at initial levels of development migration increases, because of improved financial capabilities to move, but declines with improved conditions at the source, however it does not end. De Haas (2014) tried to move the conversation away from development, by breaking the linear associations between migration and development, he has, however, tarried in doing away with the development framing in his own writing.

## 2.2 Market imbalances and migrant spatial distribution

The theories discussed in the sections above explain the economic determinants of international migration, while for most, the direction of migration is a secondary consequence. Indeed, only two of the theories mentioned above, that is, the network theory, and the transnational space theory directly explain the direction of migration. A third well known explanation for the direction is the migration systems theory (Mabogunje, 1970, Wallerstein, 1974) discussed in this section along with the New Economics of Labour Migration (Stark, 1991) and Krugman's New Economic Geography (NEG) framework.

The assumption of distorted markets presents an opportunity for greater focus on migration patterns, since their departure from market equilibrium entails a deliberate discussion of the

distribution of migrants along with perpetuations of market imbalances. In the set of theories attributed to Mabogunje (1970), Wallerstein (1974), and Krugman (1991) that rely on cumulative causation, migration into a destination would tend to stimulate enterprise and factors of production further increasing the demand. While neoclassical equilibrium predicts a decrease in wages along the demand curve as labour supply rises, cumulative causation implies a shift in the demand for labour resulting from these enterprises and factors of production. The result is a rise in wages despite the increased supply of labour. The set of market disequilibrium theories have another important consequence of explaining the clustering of migrants such as those seen in the Euro-Mediterranean migration systems and other specialised micro migration systems [see de Haas, 2014]. Although it can be argued that barriers to mobility have affected the neoclassical predictions of factor price equalisation and convergence, this justification is again a circular argument amidst its inherent flaw that the competitive market itself needs intervention to work.

### 2.2.1 New *Economics of Labour Migration*

Disequilibrium theories often predict the formation of core-periphery patterns. It may be best to start with a look at the scenario of missing core-periphery patterns as observable in the New Economics of Labour Migration (NELM) of Stark (1991). The theory avoids the bias in the distribution of migrants towards industrialised regions by stressing that migration decisions are agent based. The family, household, and cultural units of production, rather than the individual agent decide on maximising their household utility and risk management (Stark, 1991).

The NELM (Stark, 1991) is in this way able to build strongly on the interactions between migration and human capital formation seen in earlier theories. It works through an optimisation in the choice of the family member(s) who would migrate, as the household considered future returns on investment in relation to those resources. The potential migrant aims to optimise returns to his skills, so that wages as well as employment opportunities are important determinants of his destination choice. Stark (1991) assumed that skills were transferable across borders. His net benefits resulted from the differences between potential migrants who improved their skills in a bid to trade them on a global market, and the actual persons who migrated. This interaction between household decisions and global markets earned the theory a place among meso theories, attempting to combine microeconomic and macroeconomic influences. Stark (1991) predicted a

net human capital accumulation for countries of origin because skills acquired by labour in a bid to migrate were retained, since part of those who improved their skills would not eventually migrate.

The agent-based decision allows Stark's theory to remove the neoclassical emphasis that wage differentials drive the direction of migration (de Hass, 2014). The agent optimisation is reflected in risk diversification in a co-insurance type strategy through imperfect credit and risk markets (see de Haas, 2014). It follows then that international migration, once not subject to wage differentials, does not stop as the international markets adjust to equilibrium. This problem in predicting the direction of migration results from the attempt to avoid market equilibrium or disequilibrium, oversimplifying the economic agents' risk response to economic shocks. The [probably-unintended] consequence is that the NELM did not gain traction in mainstream economic migration, and it is criticised for its biased attention to the migrant origin (for instance see Abreu, 2010).

The first attempts of conceptualising core-periphery patterns are seen in Lewis (1954), who identified that an urban sector will attract workers from traditional sector given higher marginal productivity of capital, and the consequent higher wages at the modern destination. The dual market model that has evolved over time relies more on pull factors of structural demand by more advanced economies, which does not fit with the evidence that migrants go in search of work amidst worsening labour market conditions at the destination (for example see Adepoju and van der Wiel, 2010). The model situated the power to influence migration with the advanced economies, but also supported with significant debate on how developing migrant sending economies will reduce their emigration rates. This rationale has driven migration policy until the early 1990s (for discussion see De Haas, 2014).

The patterns of migration, in Lewis core-periphery models, describe dual agricultural and modern sectors, an idea taken over in Ranis and Fei (1961) and Piore (1979). The mechanisms explaining how imbalances could be sustained in an economy move away from classical equilibrium analysis. One such idea was that macro-sociological interactions including cumulative causation (Myrdal, 1957, Kaldor, 1957) sustain patterns of disequilibrium and lead to core-periphery patterns. Myrdal describes a *backwash effect* on the periphery region, describing a chain of cumulative expansions

in the core that accelerate developmental differences (Thirlwall, 2011). A resulting key contribution to disequilibrium theories is the separation of primary and secondary sectors, which provide an explanation for the demand for foreign labour amid local unemployment (Arango, 2000). Myrdal (1957) points out that in the absence of corrective government intervention, economic inequalities would persist [horizontally] between the centre and the periphery. Noticeably, historical structural theories, for instance, world systems theory, mention 'vertical' disequilibria among social classes (see De Haas, 2010 for discussion).

### 2.2.2 World Systems Theory

World systems (Mabogunje, 1970; Wallerstein, 1974) also emphasises the deepening inequalities resulting from colonialism and capitalist expansion. Wallerstein (1974) understands this world system as organised around economic rather than political centre, where regions are interdependent for various resources, basic goods and raw materials such as food, fuel and so forth. Technology drives the formation of a core, which holds powers above the periphery because of an unequal flow of surplus to the centre (Wallerstein, 1974). A capitalist world economy emerges in which capital and skilled labour would flow towards the core as a result of differentials in earnings. Wallerstein (1974) predicts that international migration is likely towards former colonies. This flow of production factors, however, is not determined by responses to market incentives but results from dynamics of this world system, for example a strong immigrant labour demand.

The theory is not clear on the mechanisms that lead to migration in the absence of wage as a motivator, but it emphasises that migration results from owners of capitalist firms searching for resources from the periphery, including labour (de Haas, 2010). These disequilibria it describes, while realistic, are not dynamic in capturing migrants' responses to structural changes (de Haas, 2014). That is, 'they leave little role for agency or microeconomic adaptation to structural challenges, as if, without government intervention, people have no choice but to migrate out of disadvantaged areas' (de Haas, 2014).

Among world system theories, the Mabogunje (1970) migration system is pertinent because it introduces rural-urban flows as a natural consequence of modernisation, an important detail in understanding self-selection by microeconomic agents. Mabogunje (1970) was extended by Kritz

*et al.* (1992) to the international scene. While historical structuralists focused on differences between political and social system, Mabogunje (1970) cited that improved transportation and communication reduced isolation of the migrant making them responsive to changes in wages, prices and consumer's preferences. Migrants were those who responded promptly to the stimuli of economic gains through relocation. Controlling forces such as inheritance, lineage systems, and communities that attempted to grow through financial cooperation, counteracted the attractions of the city. The migrant who can *identify closely* with the destination became a *city dweller* integrated into this *modern system.* The theory is able to characterise agency, but its description of how core-periphery patterns are established do not extend to mechanisms that sustain or change such patterns. Mabogunje (1970) also averred that 'migrants move along spatially clustered pathways between origin and destination' (cited in de Haas, 2014).

### 2.2.3 New Economic Geography Theory

The building block of Krugman (1991) combines core arguments from the macroeconomic structural theories with the neoclassical role of the microeconomic agent. He brings markets, structure, and location together in an analytical framework on cumulative causation combined with imperfect competition among firms. Krugman (1991) is the first to remind migration theorists of Marshall (1913) and Lucas (1998) type location characteristics, and then re-examine Lewis (1954) and Mabogunje (1970) type associations of core-periphery patterns.

In early urbanisation and agglomeration theories anchored on Marshall's identification of economies of scale and imperfect competition as sources of industrial districts; labour pooling, input sharing and knowledge spill-overs led to industrial clusters (see Krugman and Obstfeld, 2009). Workers productivity improved as they interact with one another, and the matching of skilled workers in the production process improves the chances of completing the work successfully (see Coniglio, 2002). The NEG theory adopts the neoclassical assumption on the attraction of higher wages to labour. However, rather than an equilibrium that leads to convergence of wages over time and space, Krugman (1991) argues that the location of labour influences its productivity and, therefore, wage disparities would persist. In this way, Krugman accepts the structuralists' argument that core-periphery patterns arise, simultaneously averting the error of leaving the microeconomic agent out of the migration decision.

Appositely, Krugman (1991) identifies an important dimension that *access to market*, knowing manufacturing occurs in limited locations, is driven by *centripetal* (*enabling*) and *centrifugal(obstructing)* forces. The *centripetal forces* are pure external economies, that is, increasing returns to scale and [increasing returns to] transportation costs, which foster geographic concentration of firms. There are three centripetal forces, which are *market size* (larger markets have better economies of scale), *market concentration* (thick labour markets provide factors of production and use outputs) and economies of scale or increased returns at higher production levels (Krugman, 1991).

There is a counterpart set of *centrifugal factors* that limit geographical concentration. They include immobile factors, land rent (especially land and natural resources which are accidental consequences) and pure external diseconomies (Krugman, 1991). Product and labour market competition drives firms to settle in certain regions, which, in turn, attract more labour, since these regions can offer more competitive wages. If labour is immobile, it will impede such geographical concentration. That is, the centrifugal (obstructing) forces inhibit the centripetal ones. Once these patterns are formed the advantages of agglomeration tend to sustain the trends, maintaining patterns of imperfect competition.

Coniglio (2002) also applies Krugman's work to the question of long-run equilibrium, and its associated regional convergence versus core-periphery patterns where manufactures and workers concentrate in a region. Assuming, for simplicity, no cost of migration, and that real wage differentials across regions dictate the direction of migration; suppose initially there is symmetry with same labour conditions and wages, a shock will result in the reallocation of some workers from a region two to one (Coniglio, 2002). He then describes four effects of the movement of a single worker. These are similar to the mechanisms through which the centripetal and centrifugal forces determine spread and dispersal of migrants in Kancs (2011); however, the difference is that Coniglio (2002) identifies an additional mechanism namely, a skill premium.

First, the *price index effect* describes how an additional firm entering the market lowers the price index of manufacturing goods; thereby, reducing the demand facing the existing firms and cutting profits (Coniglio, 2002; Kancs, 2011). That is, costs of living are lower in the country with larger manufacturing sector given that a smaller proportion of trade costs accrue for each manufacturing

bundle. The effect tends towards divergence. This leads to second effect, the *demand or backward linkage effect* describing how additional firms raise the demand for labour in the region. Coniglio (2002) refers to this as a *competition effect*, where the increased competition reduces local profits. The effect stabilises equilibrium. Third, entry of new firms, which lowered the price index, induces the *cost or forward linkage effect* (Coniglio, 2002). The lower prices imply reduced costs of living for workers and increased real wages. More workers move into the region given higher utility. The increased workers in the region create downward pressures on wages shifting average and marginal cost curves downwards, causing additional firms to enter the market. Eventually, conditions become more competitive driving real wages downwards, and deterring further immigration. Agglomeration in this case gives in to dispersion. Finally, a fourth effect contributed is the *skill premium*. Coniglio (2002) argues that additional skilled workers increase regional productivity; therefore, improving nominal wages. He inferred that stable equilibrium may be achieved in the face of skill differentials so that highly skilled workers may concentrate in certain destinations (Coniglio, 2002).

Coniglio (2002) concludes that the prediction of core-periphery patterns in Krugman depends on the strength of centrifugal and centripetal forces. He demonstrates that for high trade costs, workers lose the incentive to migrate since manufactures must serve from location; hence, there is a symmetric equilibrium that is stable rather than core-periphery patterns, such symmetric equilibrium form the group of theories generalised in Robert-Nicoud (2005) as footloose entrepreneur frameworks. There are variations to the stability, however, so that the model predicts a non-linear relationship between migration and trade costs. For example, as the economy becomes more integrated, if skilled manufacturing labour force concentrates in one region, productivity improves at location and the competition effect is more than compensated by the skill premium, but, at high trade costs core-periphery patterns arise (Robert-Nicoud, 2005).

Krugman's New Economic Geography (NEG) framework has been identified to pose a circular causality problem (Lafourcade and Thisse, 2008) since 'manufacturing production will concentrate in an area where there is a large market and a market will be large where manufactures are clustered'. The NEG predicts that labour migration would respond to the attraction of markets that the location of manufactures presents. The NEG, however, does not account for how global rises in productivity can further reduce centrifugal forces, for instance ,through declines in

transportation costs, or as Coniglio (2002) pointed out an outweighing of costs by highly competitive destination market factors.

The weaknesses of neoclassical theories in explaining the missing wage convergence between Africa and the industrial core necessitated an examination of network theory. While network theory helped resolved market disequilibria, it did not explain how migrants made new destination choices. Structural models introduced the perpetuation of disequilibria amongst markets so that the industrial core always provided more wage incentives to migrate, yet it could not account for agency participation in migration processes. The NEG addresses lack of convergence by assuming disequilibria in the spirit of structural form models but does not negate the role of the economic agent in migration choice. In the NEG, the migrate is not a passive victim of structural imbalances as in the world systems theory, but an active respondent to migration opportunities.

The NEG serves as a basis of the theoretical underpinning of the work because it remains useful in explaining the direction of migration, resulting from markets, between countries that did not previously have strong networks such as colonial and historical ties. The NEG theory introduces location as an important determinant of migrant distribution, a previously neglected idea. Location and its consequences of agglomeration and dispersion is an important dimension to African migration patterns because it allows a thorough examination of how migrants choose their destinations rather than continue to focus on what factors precipitate their initial migration. These features are important to describing migration patterns between Africa and the industrial core.

The NEG allows for migration costs to be distinctly accounted for within a framework of core-periphery dichotomy. Particularly, useful is Coniglio's (2002) affirmation that the relative strength of agglomeration or dispersion is meaningful to south–north migration distribution analysis of the kind that this thesis embarks upon. It has been assumed theoretically that the latter position of high trade costs makes it expedient to serve the African market from location. The intervention of Coniglio (2002) and Crozet (2004) type applications of the NEG framework concedes core-periphery patterns useful to understanding how changing migration costs can affect the distribution of migrants from Africa. In the NEG framework and its applications (Coniglio, 2002; Crozet, 2004) core-periphery patterns in migration are a natural consequence of imperfect markets and markets remain important determinants of migration.

This thesis has the task to examine Crozet's (2004) type depictions of the NEG to determine whether migration costs are evolving within a market framework, and then use them to explain [changing] migration patterns in Africa. That distance barriers are a determinant of location of manufactures is taken as axiomatic, although it is imaginable that poor attraction of manufactures in Africa is beyond a problem of trade costs. In connection with this, settling the debate on core-periphery patterns in relation to migration from Africa is a regional integration discussion, but marginal contributions may be possible in this thesis in the debate on whether changes in centrifugal (obstructing) forces are strong enough to predict that markets in the global south will be served from locations within their proximity. In addition, in this thesis a remodelling of the mentioned centripetal forces (network) and relaxation of assumptions related to centrifugal forces (relating to distance and policy deterrents) will help account for unique conditions in the Africa to the industrial core migration profile.

Finally, one resounding foundational question remains unsolved by migration theory. Which is, why do more people not migrate, particularly in an era where border restrictions were fewer than what we now find? Ravenstein acknowledged the fact that few people migrate but did not offer an explanation. Similarly, few migration theories attempt to answer this question. Lee (1966) conceptualises the migrant whose negative factors at origin in comparison to positive factors at destinations outweigh the intervening obstacles. Mabogunje (1970) characterises migrants as those who respond quickly to market signals. Todaro (1970) talks about how human capital is decisive in the decision to migrate emphasising aspirations and capabilities. Spatial immobility is a distinct area outside the scope of this study with its ideas, such as insider advantages that motivate stayers.

Albeit this challenge to the precision of prediction in migration theory, this thesis will rely on axiomatic assumptions on what we know about those who do move and how they chose their destinations. Krugman's (1991) migrant is conceptualised as the highly skilled who due to labour productivity would find it appealing to migrate. This is not a validation of selective migration criteria at the destination, but an attempt to include the possibility of positive self-selection of migrants as a function of markets as well as policy in line with the ideas of Coniglio (2002) and Crozet (2004).

## 2.3 A Review of the Migrant Distribution Methodology

A significant part of the analysis of migration patterns emphasises the Hicksian assumption that wage differentials drive migration, making market conditions a major determinant of migration. Qualitative methods are predominant in African studies using this assumption, sometimes combined with meso and macro data using community and national datasets (for example Arthur, 1991; Nwajuiba 2005; Zaqqa 2006; Makinwa-Adebusoye, 2006; Adepoju, 2008; Oucho, 2008; Fadayomi, 2010; Abdellatif, 2010). These various studies rely on census data as well as household and life-history surveys to explain economic and market determinants as a means to identify migration distribution for Africa. A predominant use of micro level data in analysis of migration patterns is partly because it captures the important role that agency plays in migrant distribution. The studies are also notable for the introduction of the impact of origin demographic factors such as age, gender, education and skill level (Abdellatif, 2010; Fadayomi, 2010) or destination demographic composition and geographic factors (Makinwa-Adebusoye, 2006).

A discussion of migration from Africa to Europe using household and life-history surveys however 'highlights combination of problems such as complementary views resulting from the migrants themselves not being questioned' (Beauchemin, 2015). Pertinently, the attention to location in these methods is limited to social and economic characteristics of the destination such as wages, income, population density, improved living conditions, and amenities that attract migrants. Whereas, more robust analysis would be required to show how destination features impact on migration streams. The assumption of constant returns to scale further fails to describe market divergences between Africa and the industrial core.

In quantitative analysis, two approaches to determining spatial patterns of migration exist. One strand of the methodological literature focuses on migrants' concentration at a destination, through changes in spread, intensity, and distance of migration (Gonzales *et al*, 2011; Czaika and de Haas (2013). In the second strand, migration patterns are explained by differences between determinants of migration, following two periods; the latter one is usually characterised by recent mobility (Bauer and Zimmermann, 1999; Coniglio, 2002; Tsegai and Quang, 2010; Kurekova, 2011; Czaika and de Haas, 2013; Garcia *et al*, 2014). Wages and the employment potential remain prominent in predicting the size and direction of migration.

In analysis situated within this first strand, Gonzales *et al* (2011) use US census data on population growth of certain groups (Hispanics) by quartiles, to show intensity of migration in certain regions during the period of 1980-2008. Further, they use standard deviations to show locations with Hispanic population above the mean values. The focus on concentration of migrants means this type of study can simply examine their magnitude at a particular location, with no attention to the determinants of migration. Zimeras and Tsimbos' (2006) exploratory techniques looking at migrants per 100 resident population in various [Greek] geographical regions showed where migration rates were high, indicating clustering [positive spatial correlation] and the converse case.

Other studies introduce drivers of migration such as markets and networks into their analysis (Tranos *et al*, 2012; Czaika and de Haas, 2013; Burzynski *et al*, 2018). For instance, a utility function derived from modelling Mabogunje (1970), help Czaika and de Haas (2013) capture gaps in standards of living between source and destination, using price indices. They arrive at a spatial distribution analysis of centrality and dispersion driven by differences in markets.

Another variant applied by Tranos *et al* (2012) uses panel regression analysis, over the period of 2000 to 2009, to study centrality and intensity of migration appealing to networks as an identified determinant of international migration. They define network using binary units to represent period of migration flow between the selected countries; and zero denotes absence of migration. The generated matrix reveals an *in-degree centrality* measuring all the origins for every destination, and an *out-degree centrality* capturing a number of destinations per origin. The weighted out-degree allows the conclusion that 96 per cent of all Mexicans target the United States and 70 per cent of all Polish emigrants go to Germany. The authors then apply a derivation of the Gini coefficient to capture concentration of migrants in Germany, US and UK, which at 0.71 they estimate as highest among the sample. Their method allows them to disaggregate in and out migration using relative and absolute measures, and to 'identify clusters of nodes with dense connections'. Alternatively, McKenzie and Rapoport (2007) proxy networks by remittances or lagged values of migration, which captures instrumental effects.

The studies depict a common problem when migrant distribution methodology concentres on one predetermining factor, which is that they must select between the effects of networks or markets, in describing migration patterns. These methodologies do not permit an exploration of how the

attraction of markets and obstruction of migration costs can occur simultaneously. Coniglio (2002) pointed out that in the absence of migration costs, wages remain the key explanation for migration patterns. Yet, migration costs are unignorable in discussing migration patterns for African vis-á-vis the industrial core.

Noticeably, data peculiarities exist in the migration literature (Tranos *et al*, 2012; Czaika and Parsons 2017), as a result of the periodic nature of migration data; so that analysis covers relatively short periods. Czaika and Parsons (2017) use highly skilled immigration into ten OECD destinations between the period 2000 and 2012 through a pseudo poison maximum likelihood method as well as a generalised method of moments to explain how a set of gravity variables, policy and other variables, affect highly skilled immigration. Likewise, in the economic growth literature, Burnside and Dollar (2004) test for the impact of aid on economic growth in 1990, using ordinary least squares and instrumental variables. While Easterly uses eight, twelve, and twenty-four, year periods on a sample covering 1970 to 1997 to test, through ordinary least squares and two-stage least squares, how aid influenced per capita growth.

The second strand of analysis on geographical distribution includes using densities, proportion of migrants or migration rates; correlation between determinants of migration and changes in their values due to recent mobility as more precise predictors of migration patterns (Tsegai and Quang, 2010, Kurekova, 2011; Garcia *et al*, 2014). This analysis type is considered more robust to the objectives of this study because of the capacity to account for both destination country attraction and contravening forces. For instance, Kurekova (2011), while investigating east to west migration within European countries following accession to the EU, uses an ordinary least square method with country specific variables to test how migration rates are affected by wage and probability of unemployment.

Kurekova (2011) adds value to modelling migrant destination by accounting for migration costs such as distance, which is treated from a market perspective focusing on transportation costs rather than geographical proximity. Moreover, in Kurekova, (2011) labour market matching agencies are perceived contributors to the volume of migration, although not determinants of migration, since their presence was considered to increase bidders for visas. The OLS method Kurekova (2011) used reported several scenarios stemming from a problem of high collinearity between wage

differentials and country specific dummies it used. It is however silent on the criticism that the wage differential relationship may be curvilinear. Particularly, migrant networks increase subsequent migration rates. Alternatively, Bauer and Zimmermann (1999) used a fixed effects panel estimator to simulate how migration rates per population responded to unemployment, real GDP per capita at origin and destination between periods of restricted versus free movement across Europe.

Other studies use linear gravity modelling to show how migration patterns are impacted by sectoral employment opportunities, as well as wages, favourable price indices at destination, networks and distance (Crozet, 2004; Paillacar and Hering, 2008; Hering and Paillacar, 2015). One set of studies uses a linearised Helpman model, (Puga, 1999; Hanson, 2001; Tabushi and Thisse, 2002; Head and Mayer, 2006)to explain migration patterns of various industrialised economies as a result of interactions with market and migration cost conditions.

Coniglio (2002) is one of the early attempts to modify Helpman (1998) to accommodate migration from farther distances. Coniglio (2002) uses labour heterogeneity to explain the positive self-selection of migrants, including from more distant locations. He evaluates spatial effects measured as the productivity of each skilled worker as a function of the proportion of highly skilled workers at a location. This affirms the conceptualisation of Krugman's migrant as the one who through accumulation of skills is in the position to take advantage of migration opportunities. Human capital (in Coniglio, 2002) rather than labour (in Crozet, 2004) captures the stock of skill in a region, while the impact of these localised externalities is reduced by distance in Coniglio's (2002) model. A notable method through which Burzynski *et al* (2018) generated the number of highly-skilled workers in a country was to multiply working age population of individuals aged 25 and divide by tertiary educated; they applied the Barro and Lee datasets.

Still, the estimation of linear models may face three problems: missing data, endogeneity and omitted variables (Kancs, 2011). Among these, the endogeneity of variables appears as a persistent methodological challenge. Willekens (2011) points to the interconnectedness between migration and [migration] policy, specifying that certain types of migration are responsive to specific policy. Similarly, Zimeras and Tsimbos (2006) address the correlation problem of numerous explanatory migration variables, using multivariate techniques. This approach is particularly useful in the

presence of latent variables, which are quantifiable substitutes for the variables of interest. Subsequently, through factor analysis, the authors identify eight variables from which four factors were distilled.

In an alternative solution, Hering and Paillacar's (2015) estimation for internal migration in Brazil uses various variables such as destination and origin year to stabilise time and state fixed effects. McKenzie and Rapoport (2007) use a mix of methods, including OLS, instrumental variables and quantile regressions to determine network and income inequality effects on migration between Mexico and the United States. They treat labour as a derived demand from commodities in various sectors in the Mexican economy. The authors remove the need for instrumenting by excluding those fixed effects such as municipality that correlated with the inequality and migration variables. Following this intervention, the OLS became sufficient.

In McKenzie and Rapoport's (2007) approach rather than use proxies to represent missing data for employment opportunities in the community, land ownership, and access to credit, they opt for the use of instrumental variables. Historical state level migration flows instrument current migration, to capture the effects of migration remittances on microenterprise capital. Further, weighted unemployment rate is used as an instrument for migration prevalence. Given that migration decisions may also affect wage determination at the destination and other explanatory variables leading to double causality problems, the preferred estimation technique is to assume that the migration decisions occur at a previous period (t-1). Consequently, lagged values of migration serve as instrumental variables. Mc Kenzie and Rapoport (2007) describe migration costs as actual financial capabilities, such as initial wealth and income. Costs are fixed and exogenous initially. Later, households optimise number of migrants by weighing costs against destination country wages, after they have met subsistence level expenses.

However, multivariate analysis and instrumenting raise difficulties in migration analysis, where the theoretical relationships between variables have not been firmly established. For instance, in some of the cases in Kurekova's (2011) estimation, the characteristics of the data did not permit the use of instrumental variables; for example, in associations between income inequality and migration, the author could not find any framework explaining why any unobserved time-varying community characteristics that could affect both income inequality and migration would result in

the inverse-U relationship that their results confirmed. The prescribed relationship between migration and inequality however indicated that some unobserved factors could account for both migration and inequality. As a remedy the authors used historic state level migration and US labour market conditions as instruments.

The impact of migration policy on source economies has been investigated through qualitative methodologies, such as a case study approach (Clemens *et al*, 2018) or a discussion of regional and country specific experiences (Jaulin, 2010). Alternatively, policy change can be transformed into a measurable indicator, through a proxy (Hoffman, 2018); by deriving an index (Easterly, 2003; Burnside and Dollar, 2004); or using a binary representation of a defined policy (Czaika and Parsons, 2017). Hoffmann (2018) measures policy as a parameter capturing educational subsidies and school infrastructure in a study to determine the impact of skilled emigration on economic development. Easterly (2003) as well as Burnside and Dollar (2004) create an index of aid policy using three categories of bad, medium and good to estimate how aid affects growth under different institutional conditions.

The benefit of Czaika and Parsons' (2017) binary representation of a defined policy is that it captures within and country variations in policy at once. This feat is applicable to the DEMIG database, which allows frequency of policy interventions within a single country, to be captured while still measuring variations arising from policy interventions of each state estimable in panel form.

The advantage of the linear gravity model over measures of centrality is that it allows for cataloguing the destination country determinants of labour migration including costs. Such exercise is useful in extending the literature on how factors impact on migration using the more recent conceptualisation of market variables and, relating them with concentration in certain locations against forces deterring mobility, such as migration costs. The main contention against the linear model however remains that fixing the determinants of migration, which is the default theoretical assumption, is considered non-justifiable in small open economies (Massey *et al,* 1993). The validity of this caveat is tested in the analysis, which contains ten African countries of various size and level of openness.

The objectives of this thesis imply that a comparison of determinants of migration to predict spatial distribution following the second approach using variations between alternatives is more useful to predict migrant destination choices. The determinants are compared two-fold, so that differences in migration patterns result from a period of recent mobility, as well as from distinct market conditions in each OECD-10 country. This research treats the endogeneity problem by opting for a mixed effects estimation technique in line with Crozet (2004), McKenzie and Rapoport's (2007), and Hering and Paillacar (2015).

**Helpman Non-Linear Form Models**

Determining migrant distributions by comparing variations between destination country conditions has also benefited from more extensive non-linear form modelling; so that the cumulative impacts of location specific characteristics, such as wage and productivity differentials between the core and periphery explain migration spatial patterns (Coniglio, 2002; Crozet 2004, Robert-Nicoud, 2005). Locations benefits of backward linkages (arising from supply of inputs) and forward linkages (related to outputs from resources that feed into other production processes), arise from the important phenomenon that migrants form clusters, in response to an agglomeration of resources, in industrial centres.

Agglomeration has received some attention in migration literature, yet little has been said about location specific cumulative effects of markets, in the case of migration from Africa to the industrial core. The Helpman model where imperfect market pulls are increasing functions of location specific characteristics, or forward linkages is useful to estimating agglomeration. The variations to the application of Helpman's model and what this research considers most appropriate representation of African migration are discussed in this sub-section.

Much of the work in this area of determining market potential has been modelling rather than testing the data. Marchiori, Shen, and Docquier (2009) for instance, use an overlapping generations model comprising of a micro founded block describing the roles of households, firms and government in the migration process, and an upstream block depicting factors such as technological progress and risk premium. The model just like Schaeffer's (2005) has the strength of a dynamic equilibrium analysis; nevertheless, Marchiori *et al* (2009) rely on simulations, which especially for migration studies is circumstantial in explaining actual distribution of migrants.

Crozet (2004), Head and Mayer (2006), Tabushi and Thisse (2002), Hanson (2001) and Puga (1999) Herring and Paillacar (2016), modify the Helpman model to explain how imperfect competition and the resultant economies of scale influence agglomeration of migrants. Puga (1999), Hanson (2001) and Crozet (2004) rely on a market potential function originating from Harris (1954), where potential demand for goods and services produced in a location are connected with proximity to consumers' demand. Harris' market potential is a function of income at destination and distance between origin and destination.[13]

In addition to market potential, other core determinants of migration feature in the models. In Puga (1999) and Hanson (2001) type applications, amenities, positive externalities, and technological spill-overs are estimated, not assumed, as in Krugman (1991). Crozet's (2004) equations allow the migrants to one destination relative to the total population of migrants to depend on total employment in the destination region, the product of nominal wage and employment rate, bilateral distance between origin and destination countries, area of host region that serve as a control for bias resulting from unequally sized regions, a full set of origin region fixed effects,[14] and an error term.

The economy operates with three sectors agriculture, manufactures and services. Assuming that agricultural goods are traded freely, then, the price can be normalised to 1. $a_j$captures the influence of local service supply. The structural Helpman model serves to obtain the elasticity of substitution ($\sigma$) and the expenditure share of manufactured goods ($\mu$). To cover for differences in conceptual definition of price index in the Helpman model identified in Krugman (1991) as well as challenges in available data, Kancs (2011) suggests estimating migration as determined by multilateral resistance, a function of the share of origin and destination in the total labour supply and bilateral migration costs and manufacturing output. Coniglio (2002) and Crozet (2004) use a simpler estimation of migration as a function of total migration to a certain destination, in the latter case

[13] That is, $MP_i = \sum_{i \epsilon R} \frac{Y_j}{d_{ij}}$, where Y is income and d is distance between origin i and destination j For Hanson (2001), distance can be measured as direct, that is bilateral distance; or hub and spoke, 'which assumes goods being transported from region *i* to *j* must pass through a transportation hub in the home region'. Hub and spoke distance are determined by first estimating the bilateral distance from a location to the transportation hub and then [from this hub] to the geographical centre of the destination. The calculation assumes the location of the hub is the economic centre or the region's largest city.

[14] Including a dummy variable regarding the European Commission's regional funds objectives 1 or 2 (*obj).*

to control endogeneity. By the same token, current migration patterns may depend on decisions made a period earlier (t-1), removing endogeneity (Crozet, 2004).

The main contribution of Crozet (2004) to the Helpman model is that he extends the Tabushi and Thisse (2002) simplification to an estimable non-linear depiction, capturing the cumulative effects of markets. Migrants estimate the attractiveness of a market from the wages, which depend on the freeness of trade ($\phi$), determined by bilateral trade. The choice conforms to Harris's (1954) type of market potential, which also allows gravity measures of market attractiveness. Wages reflects proximity to consumer's markets as workers tend to cluster at locations where they are more productive. The manufacturing and service industries combine fixed ($\in$) and marginal inputs ($\beta$) of labour, to produce a fixed quantity of output $q$ in the form $\beta_x + \epsilon_x$ and $\beta_y + \epsilon_y$. The number of varieties of manufactured goods in a region, *i,* at time, t, is written as $n_{xit}$, and for the service sector $n_{yit}$so that the total labour employment in each region at time, t, is given for up to R regions as:

$$L_{jt}^{x} = n_{xjt}\,(\beta_x q_{xjt} + \epsilon_x) \text{ and } L_{jt}^{y} = n_{yjt}\,(\beta_y q_{yjt} + \epsilon_y) \qquad \text{for every } j\epsilon\,[1, R] \qquad \text{(i)}$$

Consumers maximise their utility U = ($C_x$, $C_y$, $C_z$) given their budget constraints using a Cobb-Douglas utility preference

$$U_{jt} = C_{xjt}^{\mu}\, C_{yjt}^{\lambda}\, C_{zjt}^{1-\mu-\lambda},\ j \in [1, R] \qquad \text{(ii)}$$

where $\mu,, 1-\mu-$ are expenditure shares for goods, services and traditional industries, $\mu$ is between zero and one and represents the share of expenditure on composite manufactures. Consequently 1- $\mu is spent on agriculture$. $C_{xjt}$ is a composite of manufacturing product varieties, similar identities correspond to services and agriculture.

$$C_{xjt} = \left(\sum_{m=1}^{n_{xt}} c\,(m)\right)_{xjt}^{\frac{\sigma_x - 1}{\sigma_x}}\Big)^{\frac{\sigma_x}{\sigma_x - 1}},\ j\epsilon R \qquad \text{(iii)}$$

$c(m)_{xjt}$ is the quantity consumed of variety $m$, and $n_{xt}$is the number of available varieties in the economy ($n_{xt} = \sum_{j=1}^{R} \quad n_{xjt}$). Services are not transferable across borders, consequently the

number of available varieties in country j is equivalent to the number produced within the country ($n_{yjt}$) and:

$$C_{yjt} = (\sum_{m'=1}^{n_{yjt}} c\,(m')_{yjt}^{\frac{\sigma_y - 1}{\sigma_y}})^{\frac{\sigma_y}{\sigma_y - 1}} \qquad j\epsilon\,[1, R] \qquad \text{(iv)}$$

Crozet (2004) estimates identical variables in linear and non-linear form, but the latter captures additional parameters, which measure market factors and common borders. In Crozet's (2004) application of the Helpman non-linear model, regional employment is split up into two industries (services and manufactured goods). In addition to capturing the attraction of local supply of manufactured goods, it allows adjustments to economic integration, and migration-induced changes to be measured (Kancs, 2011). In Crozet (2004), two parameters explain the degree of agglomeration and equilibrium: the share of expenditure that accrues to manufactures ($\mu$) and the elasticity of substitution of inputs ($\sigma$). He then estimates the structural NEG utilising instrumental variables as well as fixed effects to capture country and time specific effects.

The expenditure share of manufactured goods is considered independent, because only one of the variables can be estimated, specifically, he calibrated the model. Treating the expenditure share of *x* goods (μ) as an independent parameter and assigning values to it (0.4 and 0.6 in two models), allows Crozet to estimate the elasticity of substitution between varieties ($\sigma$) and the function of distance between two regions ($\partial$). The chosen values are explained as a reasonable value of expenditure on non-traded services. They differ from Hanson (1998) whose approximations include payments for use of housing structures and use of land. Likewise, McKenzie and Rapoport (2007) rely on variations to the measurement of homogenous commodities by Helpman (1988), to suggest that if $\sigma(1-\mu) < 1$, then higher transport costs will be associated with geographical concentration of manufacturing. If $(1-\mu) > 1$, then the region's share of manufacturing employment depends only on its share of housing stock and not transport costs. In contrast, Krugman (1991) postulated that for $\sigma(1-\mu) > 1$, the range of equilibrium depends on the transport costs, so that at high transport costs, firms are in autarky and economic activity is evenly distributed.

This thesis notes the advantage of describing migrant distribution as a proportion of migrants at destination in relation to total migrants from that source as Tsegai and Quang (2010) and Garcia

et al (2014) rather than the geographic densities approach of Gonzales *et al* (2011). This migrant distribution approach captures the determinants and magnitudes of migration in the process of explaining migration patterns. This objective also drives the decision to estimates the gravity which allows a linear representation of destination specific migration determinants and Helpman model (see Crozet, 2004) application that captures cumulative effects of markets.

The criteria for selecting variables in this thesis emphasise the factors affecting migration applicable to African migration patterns from the array of variables identified in this literature review. The variable selection avoids the bias of focussing either on network or markets by combining the two in Crozet's (2004) type application of the NEG. The centripetal forces of wages, employment, networks, and strength of labour supply are within the tested models of Crozet (2004) and Hering and Paillacar (2015). The presence of networks is captured through a binary representation similar to Tranos *et al* (2012) but unlike other authors looking at regional concentration, networks represent historical ties in this thesis in line with conceptualisations of (Adepoju and van der Wiel, 2010). Additionally, the binary variable generated to capture networks is interacted with another measure, networks are proxied by remittances, which capture instrumental effects in the same vein as McKenzie and Rapoport (2007) and form a more robust predictor of the presence of networks.

An adaptation of the centrifugal forces modelled by Czaika and Parsons, 2017 as well as Crozet (2004), allows migration costs to be uniquely modelled in this thesis to capture the African reality. Policy is depicted in categories according to the change in level of restrictiveness, using a binary measure, following Czaika and Parsons (2017). First, because the objective is to test how changes in policy restrictiveness over the period of study affect (im)migration, for which various policy measures would not be comparable. The second reason, similar to Czaika and Parson (2017), is that it captures variations over time in policy changes between the OECD-10 destination countries.

The Bilateral Estimates of Migrant Stock showing destination for Africa migrants, is a periodic publication (every ten years and then in 2013 and 2017). Considering the objective of this study to examine spatial distribution of migrants, it is the most appropriate of the existing data. However, the database only reports decennial data. Consequently, this present study applies methods

appropriate to periodic data analysis similar to Burnside and Dollar (2004) and Czaika and Parsons (2017).

In a bid to solve the common endogeneity problem reported in several of the previous studies, there is a choice between instrumental variables and mixed effects methods. The challenge with instrumental variables in establishing instruments especially in the cases where theoretical explanations for observations had not established in the literature, see (Kurekova, 2011). The mixed effects methodology in line with Bauer and Zimmerman (1999) as well as Crozet (2004) is adopted, using the general least squares variant. The mixed effects methodology is useful to this thesis in accounting for any unidentified constant individual effects of countries in the panel data of the ten global north destination economies. The method is appropriate for the analysis because it is centred on the control of fixed and random effects of various variables such as destination and origin period in order to stabilise for time and country effects in the panel of Africa-10 migration to OECD-10 (see Mummolo and Peterson, 2017). This methodology also enables an inclusion of fixed measures such as geographical distance between source and receiving countries and surface area of the destination. The characteristics of the variables, specifically, distance, policy, and networks, which measure migration costs, are discrete in time but vary according to the series of destination countries such that fixed effects pertaining to individual countries can be captured. Furthermore, according to Torres-Reyna (2007), the fixed effects technique is appropriate in the presence of binary variables, such as the categories of policy change used in this thesis.

This thesis differs by implicitly relaxing the condition that Africa is too distant to respond to market incentives at the industrial core. A Coniglio (2002), inspired interpretation of the Helpman model, was adopted to explain migration from farther locations in Africa to the global north because it provides an estimable model for migration patterns. Introducing migration costs as a determinant of migrant destination choices is a means of extending regional analysis to account for migration across continents. The gravity model derived from the NEG with identical variables applied in non-linear for through the Helpman model, to my knowledge, has not been estimated for Africa. The additional parameters of market potential and effects of migration costs that feature as scalars in the Helpman model capture cumulative impacts of markets on migrant distribution from Africa. This will facilitate our objective to account for the attraction of market forces and how these could be cumulative in determining migrant distribution from Africa.

## 2.4 Empirical Literature Review

There is emerging evidence that migration patterns from Africa are changing (see Shimeles, 2018; and United Nations Conference on Trade and Development (UNCTAD), 2018. At the same time, it is increasingly documented that migration can be a source of livelihood; and markets, including employment and wages play an important role in predicting the direction of migration (see Coniglio, 2002; Crozet, 2004). Yet, studies of African migration, to my knowledge, have paid less attention to the attraction of locations characterised by productivity, in the formation of spatial patterns. This sub-section looks at the evidence available in the migration literature on the attraction of market forces, inherent in wages and additional market conditions as well as the effect of migration costs on migration.

### 2.4.1 Market Size, Market Concentration, Productivity, and Migration

The three centripetal forces described in the NEG theory are market size (which enables economies of scale), market concentration (thick labour markets that provide factors of production and use labour outputs), and increasing returns to scale. Regarding the literature covering market size, whereas, the agglomeration theory means destination country size, some studies have relied on push type analysis to capture source country size. Size of source country (Czaika and de Haas, 2013) affects emigrant dispersion, and population density determines productivity at destination (Ciccone and Hall, 1996).

Czaika and de Haas, 2013 in a cross-sectional analysis of 226 countries, found that small countries - defined as those with a population of less than half a million in 1960, which was the base year - tended to be more emigration dispersed and diverse. The emigration-disperse countries included Cape Verde and similar small islands, while the immigration diverse countries were the richer ones such as Qatar. This was interpreted to mean that internal migration is more likely in larger economies while smaller populations become internationally mobile. They find ‘a growing diverse country of origin from which less diverse global destinations receive their immigrants’. Ciccone and Hall (1996) cited in Coniglio (2002) provide evidence that productivity improves with population density in the US. Their results are reported as consistent even after they are able to control for the endogeneity of employment density, so as to exclude any effects of productivity being simultaneously associated with faster growth.

Regarding the literature has captured market concentration, the emerging discussion reflects that destination countries are characterised by productivity, which plays a critical role in migrant distributions (for example Coniglio, 2002; Crozet, 2004). Wage differentials reflect such productivity, and have remained a key determinant of migration patterns (Hanson, 2001; Brakman et al, 2002; Paillacar and Hering, 2008; Coniglio, 2002; Czaika and de Haas, 2013). The impact of wages may further be affected by the level of education of migrant (Paillacar and Hering, 2008). Wage differentials also tend to be more significant in a spatial context, when they are viewed in relation to closeness to the centre (Kurekova, 2011; Brakman *et al*, 2004). This type of spatial wage structure is also identified in Brakman *et al* (2004) and Hanson (2001), who show that nominal wages decline with distance from the economic centres or global cities. Congruently, Hanson (2001) through income shocks to a model ascertains that a ten per cent rise in income affects wages and finds the impact large on central states, and are declining rapidly as one moves in any direction from the centre. Besides, converging nominal wages among regions closer to the centre was reported to be consistent at both levels and first difference in Hanson (2001).

In the same vein disparity in wages has been found to correlate with agglomeration forces, especially income (Hanson, 2001; Paillacar and Hering, 2008). Kurekova (2011), however, reported that wage differentials may be overemphasised and less significant over time, in the case of migration between the EU8 and United Kingdom and Ireland; given observed differences in migration patterns to the two destinations. Kurekova (2011) demonstrated that migratory behaviour in countries with the same living standards and wage differentials from Central and Eastern Europe differed from that of Western Europe. This signaled that wage differentials may be belaboured as a major determinant of migration to Kurekova (2011). However, when wages were examined in a spatial context, that is, in relation to distance, they became significant predictors of the direction of migration (Kurekova, 2011). Krugman (2009), who affirms that the heroic age of migration coincides with the industrial revolution, cites Williamson (1995) on real wage convergence between Europe and the United States similar to findings of Kurekova (2011) on catch-up within the EU.

Hanson (2001) as well as Paillacar and Hering (2008) find changes in adjusted wages positively correlated with economic activity, that is, spatial labour demand depends on access to consumer markets. Disaggregated by educational levels, wage differentials were shown to drive migration

more for tertiary educated workers and those with no education, than primary and secondary school levels (Paillacar and Hering, 2008). In a similar vein, capturing more extensive location specific effects, wage and productivity differentials between the core and periphery remain a key driver of migration (Coniglio, 2002; Czaika and de Haas, 2013).

Another feature of locations that migrants find attractive is employment, which is positively affected by the effect of purchasing power on economic activity (Hanson, 2001). Also, total employment in the country of destination, has a positive impact on migration, when disaggregated by sector, and this result is driven by the service industry (Crozet, 2004). There are two explanations for the association with services rather than manufactures. It could be a direct connection where manufactures have marginal impact on migrants' decisions, so that the price index effect is minimal. Alternatively, national employment in manufactures may not represent regional access to markets. It is over this ambiguity that Crozet (2004) suggests the non-linear representation of the relationship between market factors and migration. He found that migrants do follow market potential, but it was not enough to lead to core-periphery patterns in Europe. The author also found no significant impact of market access in the linear model, that is. the centrifugal and centripetal forces were too weak to create core-periphery patterns in the European countries analysed (Crozet, 2004).

High market access, that is, proximity to consumers is a pull factor for both firms and labour (Paillacar and Hering, 2008; Fujita *et al*, 1999). Through a linear specification capturing individual characteristics, Paillacar and Hering (2008) found low market access areas are more likely to see their workers leave and high market access regions attract workers. Similarly, for Crozet (2004), the elasticity of substitution between manufacturing varieties is found to be positive but varies depending on the country. It was considered that migrants are influenced by local level of production [at destination] in estimating regional market potentials. Higher level of specialisation and differences in market access, that is a greater market potential function, influences migrants' decisions positively (Crozet, 2004).

A set of pull factors including basic infrastructure such as education and health facilities has also been used to explain the direction of migration (Hering and Paillacar, 2015). The Hering and Paillacar (2015) model for (internal) migration within Brazil, associated preference for certain

states with levels of education as predicted by the NEG; that it, is the highly skilled that would respond to markets and migrate more. Contrarily, if highly skilled workers have better access to well paid jobs, they are less likely to migrate (Hering and Paillacar, 2015) or when migration restrictions become high it limits migration opportunities to skilled workers (Russek, 2009). Studies have evinced that increase in average schooling raises productivity (see Coniglio, 2002) and well-educated people have a higher propensity to emigrate (Burzynski *et al,* 2018). Also, destinations with amenities and environmental conditions, such as rainfall, attract migrants (Garcia *et al*, 2014; Tsegai and Quang, 2010).

Migrants tend to cluster at certain spaces (Gonzales *et al*, 2011; Tranos *et al*, 2012). In a study of Hispanic migrants, Gonzales *et al* (2011) identify strong geo-spatial reconfiguration of migrants. Hispanics moved to new destinations during 1990 to 2000. This period of geo-spatial concentration compared with the other two periods they studied (1980-1990 and 2000-2007) coincided with higher impact of market access, captured in their error term. The results of cross-country analysis show that Germany, United States, and United Kingdom are the most central destinations, in absolute values, for migrants from 32 OECD countries (Tranos *et al*, 2012). The literature on Africa identifies the same countries among top destinations for African migrants (see World Bank, GBMD 2018). However, when migration is weighted, countries such as Switzerland and Luxembourg have high migration inflows relative to their population, and only Germany stands in both relative and absolute terms as a central destination for Africa.

The third centripetal force, which is increasing returns to scale, tends to be embedded when measured with the other two indicators; it reflects productivity. In a few studies, productivity can be distilled out of the other two forces of market size and market concentration. Generally, share of origin and destination in total labour supply deter migration at origin but encourage migration at destination (Kancs, 2011, Crozet, 2004, Hanson 2001). Lower values of total labour supply indicate lower own price elasticity of demand for individual goods and more imperfectly competitive markets.[15] In Crozet (2004), the lower values of total labour supply compared with other studies, are attributed to lower incomes and higher importance of product prices in the Central and Eastern Europe (CEE) region and also to higher expenditure on food and agricultural

[15] Notice that $\sigma$-1 represents the ratio of price to marginal cost, for every profit-maximizing firm. Consequently, at equilibrium price equals average cost, so that i>1, indicates economies of scale.

products in the mentioned sample size. Furthermore, the parameters are significantly different across their sample size, although similar in order of magnitude (Crozet, 2004).

A few studies examined whether such factor productivity would be reduced through international trade (Bruder, 2004; Lund, 2009; Olubiyi, 2013). In examining whether factor differences generating international trade would eventually obliviate migration as the less likely substitute, Bruder (2004) found that trade reduces migration significantly for Germany, quite contrary to the results of Lund (2009) showing complementarity for the same country. Similar to Lund (2009), in comparing the relations between Nigeria and its five top trading partners, Olubiyi (2013) concluded on the complementarity of trade and migration. Lund (2009) attributed the varying results to the use of commodity trade variables only, while excluding those for services.

Immigration is also associated with manufacturing sector improvement as the United Nations Conference on Trade and Development (UNCTAD, 2018) found a one per cent increase in in-migration may have accounted for between 0.23 and 0.43 per cent of added value in manufacturing sector. Part of intra sectoral productivity results from migrants employed in those industries. Higher manufacturing output at country of origin deters labour migration, while it attracts migrants to productive destinations (Kancs, 2011; Paillacar and Hering, 2008; Crozet, 2004). This market access is both sector and region specific, so that people move more to regions with high labour demand in their sector (Paillacar and Hering, 2008). Kancs (2011) also determined that not controlling for country-pair fixed effects increases the variation of share of origin and destination in total labour force supply and bilateral costs, although the magnitude does not change significantly, manufacturing output responded with even less changes.

A part of the productivity returns arises from networks, which provide information including on finding employment and housing and pool resources; Networks characteristically reduce migration costs through information sharing, improved community support and shared housing (McKenzie and Rapoport, 2007). Mexicans with networks had a higher probability of employment in the US and found better paying jobs (Munshi cited in McKenzie and Rapoport, 2007). The empirical literature notes a network of various communities such as the Scandinavian network of Denmark, Finland, Sweden, Estonia, Norway and Iceland, the post-colonial and commonwealth network of United Kingdom, Australia, Iceland, New Zealand, and a Central European cluster. Post-colonial

and commonwealth ties have been used to explain the formation of networks between UK, Australia, Ireland and New Zealand (Tranos *et al*, 2012) as well as between African colonies and their colonisers (Adepoju and van der Wiel, 2010). Immediately following independence of many African countries, their initial migrant destinations were familiar ones, through colonial networks, common language, and personal contact with tourists (Adepoju and van der Wiel, 2010).

A significant part of the literature on African migration patterns has focussed on how declining economic conditions in many African countries push migrants towards prospering regions ignoring the prominent role that market location plays. Fadayomi (2010) reported that Nigeria and Gabon were early migrant destinations, particularly during the oil boom; emigration from Africa was, however, affected by political instability starting in the 1980s. In circular migration patterns rural migrants moved to urban locations to replace those who had emigrated internationally, for example, from Mali and Burkina Faso to France; net receiving countries, tended to attract internal migration to regions that were prospering (Adepoju, 2006). In Sub-Saharan African markets, absolute migrant values have risen at the same time with population growth (Gonzalez-Garcia *et al*, 2016). In the process of migrating, the human capital of many countries in Africa was depleted and increased education without a private sector to absorb graduates contributed to loss of skilled personnel from Africa (Garcia *et al*, 2014; Adepoju, 2008; Makinwa-Adebusoye, 2006).

This focus on push factors meant that the African migration literature has had robust discussions on the impacts of migration on source countries, but less attention to patterns of migration in relation to the pull of destination country markets outside the continent. This thesis contributes to the discussion on the predictability of destination country markets, characterised by productivity, on migration patterns from Africa. The research therefore re-examines the roles of established determinants of migration from Africa within a market productivity setting.

Table 2.1 discusses markets in Africa, which appear to be improving relative to the 1990s, as unemployment and labour productivity are recovering, but the wage differentials compared to the OECD were enormous. Some African economies had also moved to middle income status; the migration literature associates improved income with the financial capability to migrate (see de Haas, 2014). Likewise, consumer prices tended to perform better in more recent years. Africa's economically active population holds a demographic bonus, represented by significant growth in

the proportion of youth that can drive economic benefits in the region (for discussion see Conor, 2018). The demographic composition in Africa of economically active population contrasts neatly with ageing population in most of the OECD as well as rapid growing Asian economies.

The emigration rate, or proportion of skilled persons migrating from each country, by level of skill are less than one per cent for countries such as Burkina Faso, Seychelles, Chad, Botswana, Lesotho, Namibia and Swaziland (Beine, Docquier and Rapoport, 2006).[16,17] International documented migrants from Africa are educated at secondary school level and above, who have the financial and educational capabilities to migrate, with a larger proportion at their working age (for example see Adepoju, 2017). The claim that Africa loses highly skilled workers to countries in the global north is accurate to the extent that of all continents with tertiary emigration rate, Africa has the highest (12%),[18] followed not so closely by Europe (7%), Latin America (6%) Oceania and Asia (about 4%) and North America (0.7%) (see Minter, 2011). Notably, most of the African islands have sizeable highly skilled migration rates, including Cape Verde (76%), Mauritius (55%) and Comoros (21%) given their small size and periodic unsuitable environmental conditions.[19]

Seychelles is an archipelago doing well economically among African countries with per capita income over 1,000 USD showing less incentive for high skilled migration. The other countries in this category are large (top 20) in geographical size. Internal migration is hypothesised to be more for larger countries as they have more possibilities than smaller ones to address push factors of migration through urban mobility (see Czaika and de Haas, 2013).

[16] That is, 'the ratio of the total number of skilled emigrants to the total number of skilled natives (emigrants plus residents)'

[17] You might also be familiar with the term brain drain rate, Clemens (2015) advices against the use of such 'derogatory' ideas.

[18] Clearly Africa is the continent and not North Africa, however the tertiary emigration rate for Africa is 9.3% as a whole, notably North Africa pulls the average downwards with lower tertiary emigration rates.

[19] Other countries with voluminous skilled migration include Rwanda (64%) and Somalia (97%), with obvious economic and political challenges. Notably, some countries, particularly in western Africa, which have both the financial means and the economic incentive to migrate have over 20 per cent skilled migration rates including Ghana (45%), Tanzania (36%), Congo (21%) and Uganda (24%).

**Table 2.1: A selection of economic indicators for Africa-10 countries, 2016**

| | **Northern Africa** | | **Southern Africa** | | **Western Africa** | | **Eastern Africa** | | **Islands** | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Indicators/unit of measurement** | Egypt | Morocco | Botswana | South Africa | Ghana | Nigeria | Kenya | Malawi | Mauritius | Seychelles |
| Income category | Lower Middle | Lower middle | Upper Middle | Upper Middle | Lower middle | Lower middle | Lower middle | Low | Upper middle | High |
| GDP growth (%) | 4.3 | 1.1 | 2.9 | 0.3 | 3.6 | -1.5 | 5.8 | 2.5 | 3.7 | 4.5 |
| Unemployment (total, % of labour force) | 12.0 | 10.0 | 18.4 | 25.9 | 5.8 | 5.0 | 11.0 | 6.7 | 7.8 | 4.5* |
| Inflation, consumer prices (%) | 13.8 | 1.6 | 3.8 | 6.3 | 17.5 | 15.7 | 6.3 | 12.9 | 1.0 | -1.0 |
| Personal remittances received (current US$, millions) | 16,584 | 7,087 | 28 | 755 | 2,041 | 18,956 | 1,727 | 32 | 246 | 25 |
| Emigration rate of tertiary educated (%) | 4.7 | 18.6 | 5.2 | 7.4 | 44.7 | 10.5 | 38.5 | 20.9 | 56.0 | 77.3 |
| Predominant Religion (%) | 95% Muslim | 99.9% Muslim | 72% Christian | 81% Christian | 74% Christian | 49% Christian | 84% Christian | 82% Christian | 53% Hindu | 94% Christian |
| Historical/ Colonial ties | British | Spanish & French | British | British | British | British | British | British | Portugal | British |

Sources: Derived by author from World Development Indicators, 2017, International Labour Organisation Data

### 2.4.2 Migration Costs

In the NEG theory, centripetal forces, or those that deter migration, include immobile factors, land rents, transportation and other transactional costs as well as pure external diseconomies. The migration literature identifies three mechanisms through which costs deter migrants' decision; transportation costs whether in the form of actual expenses on travel or through the effects of distance, related financial expenses, and the additional burden associated with restrictions on mobility for example through destination country policy.

A number of scholars have demonstrated the positive selection effects of higher costs of financing migration on the middle-income class (De Haas, 2014; McKenzie and Rapoport, 2007). Wealth could have one of two opposite effects, an increase in wealth eases credit constraints, with a follow-on increase on the likelihood of migration at any level at which there was an initial migration, otherwise, it may increase the opportunity cost of migrating (McKenzie and Rapoport, 2007). Moreover, decreasing migration cost not only eases financial constraints to mobility, at the same time, it increases the benefits of migration. Burzynski *et al* (2018) also avowed that persons with higher level of education would be the ones to take advantage of economic opportunities and other conditions abroad. Furthermore, McKenzie and Rapoport (2007) found that real depreciation of the Mexican pesos relative to the US dollar reduced migration, possibly because of its contribution to increased mobility costs.

Migration costs have also been shown to increase with distance (Garcia *et al*, 2014; Paillacar and Hering, 2008; Tsegai and Quang, 2010). Crozet (2004) and Coniglio (2002) argue that distance to location has increasingly affected migrant destinations in more recent years (1980-90) compared to 1970-80. Coniglio (op. cit) specifically shows the importance of trade costs, noting that certain ranges of trade costs make migration advantageous only to the highly skilled. Having represented the common border with a dummy variable, crossing more than one regional border reduces migration (Crozet, 2004; Hanson, 2001). This continues to feature in migration patterns between Mexico and the US, estimated at 97 per

cent concentration, or Poland and Germany, at 70 per cent, as determined by Tranos *et al* (2012).

Coniglio (2002) also captures changing trade costs and the impact on stability of equilibrium towards agglomeration or dispersions. They compare low and high skilled workers real wages at different levels of trade costs. High trade costs are reported as values $\tau = 2.714$ *or* $\phi = 0.05$, where the long run equilibrium converges, and manufactures find it cheaper to serve markets on location; therefore, industry is equally divided. Also, bilateral migration costs, if higher, deter migration at origin but encourage migration at destination (Kancs, 2011, Crozet, 2004, Hanson 2001). Lafourcade and Thisse (2008) through analysis of historical data showed a relationship between fall in transportation costs and rising regional inequalities, which was estimated to be bell-shaped given that transportation and communication costs could fall below a threshold where regional inequalities then start to decline. Conversely, at low transport costs, there is spatial agglomeration. The conflicting predictions arise because homogenous products, for instance, agriculture or housing are not freely traded.

Since earnings subject to the probability of employment affected migration, implicitly, labour market policies at origin and destination affect the volume of migratory flows (see Massey, 2005). Migration policies have also been used by various destinations to limit migration inflows or select the desired immigrants by education/skill level, nationality, and other criteria. How effective these policies have been is unresolved in the migration literature (De Haas *et al*, 2015); however, much effort has been put into capturing the impact of policy changes on migration through various databases, including Mountford and Rapoport (2014), and, for example, Mayda and Patel (2004) as the latter detailed policy interventions of fourteen countries, which was expanded to 26 by Ortega and Peri (2012). An interaction of distance and networks through the estimation of a structural form model in Crozet (2004) helps to understand how migrants can reduce the costs of migration associated with distance through the networks they have.

According to De Haas *et al* (2015), post-entry rights, for example family re-unification, citizenship, and residence rights, as well as access to social benefits, contribute to the decisions of migrants already in the country as well as potential migrants as deterring,

attracting, and retaining factors. Czaika and Parsons (2017) found that skill selecting and skill targeting policies, such as the point-based system, influenced the flow of highly skilled migrants, while the overall effect on all migrant populations was uncertain. Flahaux (2014) also evaluated the impact of policy on return migration of the Senegalese, using the Senegalese surveys that capture detailed migration histories and the DEMIG policy database as tools for measuring policy change. Through discrete-time event history analysis, and logistic regressions, they compared the likelihood of return migration occurring, using three defined levels of migration policy change classified as access, stay, and return polices, and representing positive values for more restrictive while less restrictive took negative values. Migrants responded to controls to market access laid down by former common destinations like France and England, which were also former colonies who first restricted mobility (Adepoju, 2006; Flahaux, 2014).[20]

The DEMIG database is a comprehensive categorisation of OECD migration policy, under major, mid-level, minor, and fine-tuning changes. The database separates policy changes by the number of measures existing within a single act; for instance, the United States Immigration Act of 19 Nov 1990 is less restrictive on three counts. First, it added 55,000 visas for spouses and children. Second, there were increases in per country visa limitations by 5,620 and third, it recoded 32 grounds for expulsion into five categories; for instance, it repealed expulsion on health grounds. A law could also be more restrictive on some counts and less restrictive on others, for instance, the Spanish Organic Law 7/1985 introduces a minor less restrictive change by updating the work permit system, but is also minors more restrictive in the family reunification rights of foreigners through income requirements.

De Haas *et al.* (2015) used five criteria to assess the changes in restrictiveness: '*Quantity*: does the measure restrict (+1) or widen (-1) the pool of migrants gaining entry, stay or exit rights? *Composition:* does the measure raise/specific (+) or lower/ make more generic (-1) the eligibility criteria for entry, stay or exit of a particular migrant group? *Procedure*: does the measure make specific procedures for entry, stay and exit more (+1) or less (-) complicated for the targeted group? *Choice*: does the measure restrict (+) or widen (-) the

[20] The other substitution effects defined arising from stricter migration polices are *categorical* where migrants adjust their legal or illegal entry; *reverse flow* in which migrant adjust to permanent settlement whereas they previously engaged in circular migration; and *inter temporal* or sudden short-term change in migration anticipating policy change.

choices available to migrants? *Control*: does the measure increase (+) or relax (-) the level of control of migrants at the border or within the territory?' They were able to code 78 per cent of all policy changes according to whether they were more or less restrictive, overall 47 per cent of policy changes were less restrictive, and 31 per cent more restrictive. The authors also catalogue *no change,* which means 'a completely new selection system was introduced, whose restrictiveness cannot be compared to any previous legal framework, such as the introduction of a point-based system into a legal framework that was previously demand driven or for measures whose impact on rights could not be assessed because changes affect non-coded dimensions particularly age and gender groups' (De Haas et al, 2015, p.13).

Unfortunately, the DEMIG database period of reporting ends in 2014. Moreover, the database does not report all migration programmes and policy debates; whereas, enactment and implementation of policy are two separate matters. Only those policies that have been passed and not how they are enforced could be captured objectively in the database. Legal entry and stay are the most significant area of intervention across countries, as 47 per cent of all policy changes fall within this category, compared with 27 per cent on integration, 13 per cent on border control and closely behind at 12 per cent on exit (de Haas *et al*, 2015).

### *Migration Policy: Legal entry and stay*

The DEMIG database (IMI, 2015) shows that migration policy and the beginning of restrictiveness dates as far back as 1790 with the introduction of naturalisation laws in the United States, and later around nationality movements associated with the World Wars. The early migration policies were about setting borders, evolving from nationalist ideas about who could be desirable citizens.

Naturalisation was acquired ius soli, that is, by birth on the territory; for instance, the 1981 British Nationality Act, granted automatic citizenship ius soli; or ius sanguinis as in the case where it is acquired through parents. As late as 1993 ius soli was procedural rather than automatic in France. Status also differed by occupation in France where a new status for foreign doctors, artists, and technicians in the entertainment industry applied in 1993. Citizenship was patrilineal until recently, for instance, it took a 1945 ordinance in France to allow for naturalisation through women, while in 1981, for British spouses of different

nationality, it was the woman who acquired the man's right of abode if she married a citizen. Access to citizenship could be acquired by years of residence as in the US 1940 Nationality Act where eligibility required three years of residence for US spouses; however, people could be excluded on basis of race, and this exclusion had included other *undesirable*s. Citizenship also allowed for distinctions as in the 1948 British nationality Act retained the term British subject for Commonwealth countries in its citizenship arrangements.

Withal, IMI (2015) records that rationale such as the primacy of native workers (since 1927, but still relevant in Germany today) maintained their influence in determining the migrant quotas in relation to receiving country's labour market conditions. Following the human rights movements of the 1970s, much of migrant selection criteria on the basis of race was dissolved. In the 1970s, family reunification policy in much of Europe was still liberal, and some African countries including Morocco and Nigeria who had initially migrated for work brought their families abroad, but by the 1990s stricter rules were applied such as visa restrictions for Moroccans going to Spain in 1991, and suspension of the Commonwealth of Nations visa free conditions. A majority of the post 1970 less restrictive policy interventions classifications fell under the DEMIG policy tool named *access to justice and political rights*.

Citizenship by residence as well as by marriage also became more restrictive from the 1990s where the number of years for eligibility was variously increased. Point Based Systems were introduced in the United Kingdom through the 2008 green paper, and increased fees and regulatory activities in the US starting 2007. Citizenship could also be acquired through service as illustrated in popular cinema footage showing African Americans enrolling for war, according to the 1968 Immigration and Nationality Act. Policy is less restrictive when it allows the benefits of dual citizenship such as Canada's 1977 New Citizen Act.

### *Migration Policy: Integration*

Integration measures have varied between countries and over time. In 1963, Britain had its work, family and protection route to citizenship, which became even stricter by 2009, while France had a welcome and integration contract requirement in 2011. France became again more restrictive by 2012, by postulating the adoption of French language and culture tests, signed charts on citizen rights and duties. Contrastingly, in the same period, France relaxed

naturalisation tests, removed restrictions on naturalisation after illegal stay, and eased access to those under the age of 25. Appositely, at the tail end of the 1980s, recruitment agreements in Europe became increasingly regional, such as German labour agreements with Eastern European countries. Dual citizenship for some countries such as Germany also requires special permission in the case that giving up other citizenship entails undue hardship or is not allowed by the country.

Restrictions of work permits started in the 1930s, where foreigners were defined and logged on register in 1938. Foreign work permits were based on labour conditions and these prioritised nationals. Permits were also given to family of migrants who were in the process of naturalisation through reunion measures seen in the France November 1975 Decree. This was not an assumed right as confirmed by Decree 1977 in France where these work permits were no longer automatic. Accordingly, in France, by 1935, work permits were not extended for occupations where there was unemployment. Foreign workers could only be employed where there were no nationals according to the France Decree of 1949 (see de IMI, 2015).

An examination of the DEMIG database (IMI, 2015) also shows that labour shortages were absorbed through labour agreements for workers including those from Africa, such as in 1963 between Morocco and Germany, between Morocco and France, again in 1964 between Morocco and Belgium. There have been similar labour market arrangements within the continent as the 1965 convention between Senegal and Morocco, and in the same year between Algerians and Morocco for free access to enter, reside, and work between the two countries, the same applied between Tunisia and Morocco in 1966, and with Libya in 1983. In 2005, Spain signed a bilateral agreement towards the employment of Moroccan seasonal agricultural workers.

The DEMIG database (IMI, 2015) is detailed showing policy interventions by timelines. In 2012, through a decision of *Consile d'état* (State Board), France re-established the initial 30 occupations. Through a circular, France also eased work permits for foreign students who had successfully completed at least a master's level programme, non-EU students who had completed a master's degree could apply for temporary stay and under certain conditions permanent stay could be granted.

Seasonal agricultural working scheme (SAWS) introduced in 1945, allowed foreign

students to work on British farms. Stay permits and permanent residence permits were introduced in 1965. At the time, foreigners were prohibited from occupations like medicine and law in France. In 1997, Canada introduced tougher requirements for family sponsorship, for instance, the cancellation of the *assisted relative class* that previously earned points for those with family in Canada. In addition, by 1999 immigrants' investor program cut potential for abuse and stipulated increased restrictions again in 2001.

### *Migration Policy: Border control*

Setting quotas for foreign workers is the most applied control measure on migration (de Haas *et al,* 2015). The Millerand Decrees of France in 1889 (cited in IMI, 2015) limited foreign workers as a per centage of the population to between five and 30 per cent. Workers per firm quotas were first introduced the United Kingdom and France in 1932, as post-depression measures. The UK limited permits issued, which exempted exceptional talent and prioritised those on an occupation shortages list (NME, 2013).

Countries refined these procedures to their labour needs. Canada introduced a point-based system, which had begun by setting targets towards its immigration growth strategy. The Canadian immigration quota increased almost twofold in the 1990s relative to the 1980s but remained the same or increased marginally in the 21st century, up until 2012 when it was once again decreased to its 1980 values. Based on figures from the government of Canada, African immigration to Canada increased steadily over the same period, regardless of overall quotas (Statistics Canada, 2016). The DEMIG database (IMI, 2015) also shows that Italy used quotas widely since the 1990s, prioritising countries with which it had bilateral agreements, by category (independent or contract), length (seasonal, short, or long term), and occasionally by sector. Spain also introduced quotas for foreign workers in 1993 (IMI, 2015).

In 1973, the Canadian immigration board cancelled the right of appeal to immigrant and visitors' visa holders, thus implementing a major, more restrictive change in exit policy (IMI, 2015). In the US, quotas became flexible in the 1990s (IMI, 2015). In 2002, specific tools for deporting potential terrorists, anyone involved in organised crime and similar groups including criminals and irregular migrants were introduced (IMI, 2015).

The European Union, around the 1990s moved to visa liberalisation deals, seeking cooperation from sending economies in controlling irregular migration in exchange for freer movement of documented migrants (IOM, 2011). Globally, various country migration strategies included designs to combat illegal immigration starting around the year 2000; some African countries such as Morocco and Nigeria have similar initiatives (IOM, 2011). Yet, African countries lack adequate internal regulation of documents to benefit from similar initiatives on visa liberalisation (IOM, 2011). The ordinary African migrant has persistently been unable to take advantage of liberalisation opportunities at these OECD destinations sometimes as a result of ethnic discrimination (until 1960s), skill targeting (since 1960s) or regulatory discrepancies (since 2000) (see details in the DEMIG database, IMI*,* 2015).

***Emerging Destinations for African Migrants and policy interventions***

A few common features describe the new African destinations, such as a delay in recognising the permanent nature of immigration and social integration of migrants, as well as emerging labour markets. For instance, while Spain had been one of the top ten destinations for African countries, it was in the 1980s that it became a net receiving country (see World Bank GBMD, 2018). Implicitly, it was not until 1985 that migration became a focus of government policy in Spain (IMI, 2015). The Law on the Rights and Freedoms of Foreigners in Spain and their Integration (Law 4/2000) emphasised integration and recognised the permanency of immigration (IMI, 2015). Spain signed bilateral agreements with Nigeria on repatriation, which is a common procedure for limiting the number of migrants from specified destinations (de Haas *et al*, 2015). There has been a rise in immigration to Spain, nineteen-fold since 1980 (Migration Policy Institute (MPI), 2003). Morocco has the largest share of African migrants to Spain at 12 per cent while other African countries share five per cent (World Bank GBMD, 2018).

Switzerland described her migration policy as pragmatic and that foreigners have contributed to its construction (Miserez, 2016). In the late 1960s, initiatives *against foreign control* had set in, but immigration policy tried to ease tensions for instance in 1970 through a Commission for Foreigners (IMI, 2015). They issued an overall limit to the recruitment of foreign workers, after the post-world war reconstruction had eased; by 1973, this was

translated into regional quotas (de Haas *et al*, 2015). Employer sanctions for taking in those without work permits were raised in 1984 (IMI, 2015). Similarly, quotas for seasonal workers became less restrictive in 1992 and so in the same year access to citizenship for foreign workers eased (IMI, 2015). Switzerland also became more restrictive in 2008 when all migrants except from the EU and European Free Trade Association were required to sign an integration agreement with the authorities (IMI, 2015). Quotas again eased in 2001 and foreign workers' rights improved in 2008, including family reunification for short term workers (IMI, 2015).

Sweden became a net sending economy after WWII, but after opening her borders immigration increased and peaked by 2013 (Swedish Government, 2015). In dealing with increasing immigration, given that 1970 was characterised by saturated labour markets, the Swedish Migration Board tightened its borders (Swedish Government, 2015). Tacit social structures such as speaking Swedish language, enhanced opportunities to gain employment and to socialise, even though most people in Sweden speak English (Swedish Government, 2015).

Similarly, in 1975 the Norwegian government through the *immigration stop program* aimed to reduce immigration, which continued until the 1980s. Similar documentation was the norm around the Scandinavian region (IMI, 2015). In neighbouring Norway, labour migrants were required to have work permits and after three successive years of living in Norway one can apply for a settlement permit (IMI, 2015). Citizenship was gained through seven consecutive years of living in Norway (IMI, 2015). Most revisions to the Norwegian immigration act refer to refugees and asylum seekers (IMI, 2015). Workers permits increased between 1999 and 2004 but mostly (74%) to accommodate new European Union countries (de Haas *et al*, 2015).

The Netherlands had historically been tolerant towards other cultures and religions and allowed guest workers in the 1960s to maintain their culture and languages while benefitting from Dutch welfare state, particularly housing (see Netzwerk Migration in Europa (NME), 2013). Similar to the German guest worker agreements, it was assumed that workers wanted to eventually return to their origin. Notably, most African workers to Germany and the Netherlands were from the northern African hemisphere (IMI, 2015). African migration

policy in rare cases such as Morocco's 1973 to 1977 development plan positioned migration as a strategy to relieve excess labour supply (IMI, 2015).

Integration measures started within the Netherlands about the1970s and by 1998 the *Law on the Civic Integration of Newcomers* was passed requiring mandatory language and civic integration (IMI, 2015). A later Law on Integration, 2007 exempted the EU, Switzerland, Turkey, and European Economic Area (EEA) but obliged others to take a Dutch language and cultures test a few years after arriving in the Netherlands (IMI, 2015). A similar examination is required to receive a three months visa especially for those who want to marry a Dutch citizen (Government of Netherlands, 2015). A resident cannot however be denied residency on the grounds that they have not passed the examination but can be fined, including for dressing in a way (such as purdah) that limits possibilities of employment (Government of Netherlands, 2015). Netherlands has not only been tolerant to undocumented migrants but has also been attracting skilled migrants from Africa with its 2004 inviting policy that appeals to a point system to select desired migrants (Adepoju, 2008).

A discussion of the various forms of destination country migration policy interventions in the context of African migrants is necessary. These policy interventions that this thesis focuses on are measured in the most recent and comprehensive migration policy collection; the Determinants of International Migration Policy (DEMIG) (International Migration Institute (IMI),2015).[21] The discussion is structured around policy areas of intervention as categorised in the DEMIG database: legal entry/visa requirements and stay, exit, and border control. The DEMIG policy database aims to 'assess the effectiveness of migration policies in affecting different target migrant categories' (Flahaux, 2014). The authors (De Haas *et al*, 2015) conceptualise policy as 'rules, laws, regulations and measures that national states define and enact with the objective of affecting the volume, origin, direction and internal composition of migration flows.' The impact of policy remains mixed in the literature with supporting evidence (see Adepoju, 2006; Flahaux, 2014) depending on data type and focus of the analysis. One of the challenges is that restrictive policy as a centrifugal migration

[21] Determinants of Migration Policy (2015) *DEMIG POLICY, version 1.3, Online Edition.* Oxford: International Migration Institute, University of Oxford. www.migrationdeterminants.eu

force has been sparsely explored for Africa. This entitles the policy variable to a more detailed discussion here.

One challenge is that there is a dearth of evidence on policy impacts by level of restrictiveness. This thesis extends the works of Flahaux (2014) and Czaika and Parsons (2017) on the impact of policies on Senegalese migration to other African countries; but this thesis does not isolate policy impacts but treats them in relation to destination country market conditions. Policy is measured by level of restrictiveness in this thesis, rather than by type of intervention as in the case of Flahaux (2014) in order to ascertain whether increasing policy restrictions reduced migrant stock at a destination.

There is conclusive evidence that market concentration, size and productivity attract migrants, even though in some studies some variables are more representative than others in capturing these effects. There is a large pool of evidence (Hanson, 2001; Brakman et al, 2002; Paillacar and Hering, 2008; Coniglio, 2002; Czaika and de Haas, 2013) showing that wages reflect workers' productivity. This productivity is enhanced by the spatial context (Brakman *et al*, 2004; Hanson, 2001) and insignificant in fewer cases (Kurekova, 2011). Studies also found the pull of employment at the destination correlates with migration (Hanson, 2001; Crozet 2004). Crozet (2004) who find that association enhanced in the service sector also observed that lower total labour supply indicated imperfect competition. On account of the discussed evidence, networks reduce migration costs for African migrants, but it remains unclear how that happens within a spatial framework, that is, in relation to distance migrants cover.

In terms of centrifugal forces, a large body of evidence also associates lower migration volumes with higher migration costs (Garcia *et al*, 2014; Paillacar and Hering, 2008; Tsegai and Quang, 2010). At the same time there is some evidence of lower impact of distance or other measures of transportation costs such as Lafourcade and Thisse (2008) who found a bell shaped curve representing migration costs in relation to regional inequalities. This thesis extends gravity type models, where distance is an important driver of migration to explain African migrant distributions across the global north. While many of the market variables examined remain the same, the adopted analytical framework allows for a distinct interpretation of how these factors may be changing and/or sustaining migration patterns.

# CHAPTER THREE

# METHODOLOGY

## 3.1. Theoretical Framework: The New Economic Geography Theory

This chapter proceeds from appropriate modifications of assumptions to reflect the peculiarity of African migration to global north. This thesis then adapts two models, both inspired by Crozet (2004). First, a gravity model to describe how centripetal and centrifugal forces predict migration volume at various destinations. Extending Crozet's (2004) application to Africa means the thesis emphasises that wages reflect productivity and, therefore, economies of scale at destination. Second, it explains the predicted symmetric equilibrium formed, and the subsequent migration as a response to attractive commodity and labour markets, or forward linkages using a Helpman model.

This thesis considers R regions, where R equals two, defined as global south, Africa-10 and global north, OECD-10, in conformity with the assumptions of Krugman's New Economic Geography theory. Labour (l) is split between the traditional sector (z), manufacturing (x) and services (y). There is imperfect competition in manufactures and services so that the sectors exhibit economies of scale. The regional nominal wage (w) depends on demand for intermediate and final goods, price index of manufactured goods (p), and elasticity of substitution of manufactured goods ($\sigma$). The lower the elasticity of substitution the higher economies of scale, since in equilibrium $\sigma / \sigma - 1$ represents the ratio of average to marginal costs, a measure of economies of scale.

Following from Crozet (2004), the free on-board price of a variety produced in the country is:

$$p_{xj,t} = \frac{\sigma_x}{\sigma_x - 1}\beta_x w_{jt} \quad \text{also, } p_{yj,t} = \frac{\sigma_y}{\sigma_y - 1}\beta_y w_{jt} \tag{1}$$

There is free entry, therefore zero profit in equilibrium, then the number of firms in each region is:

$$n_{xjt} = \frac{L_{jt}^X}{\varepsilon_x \sigma_x} \quad \text{and, } n_{yjt} = \frac{L_{jt}^y}{\varepsilon_y \sigma_y} \quad j\epsilon\,[1, R] \tag{2}$$

Workers' real income is lower in locations where limited number of services is offered.

$$w_{jt} = \frac{w_{jt}}{P_{xjt}^{\lambda} P_{yjt}^{\mu}} \tag{3}$$

Labour moves to where there is higher present real wage at a speed that is proportional to the wage differential. Lander (λ) is the strength of labour externalities. The Constant Elasticity of Scale price index of the aggregate of manufacturing and service goods in the country j, is:

$$P_{xjt} = [\sum_{l=1}^{l=R}(\sum_{m=1}^{n_{xlt}}(Bd_{jl}^{\delta}\ P_{xmlt})]^{\frac{1}{1-\sigma_x}} = [\sum_{l=1}^{l=R} n_{xlt}\ (Bd_{jl}^{\delta}\ P_{xlt})^{1-\sigma_x}]^{\frac{1}{1-\sigma_x}} \tag{4}$$

$$P_{yjt} = (\sum_{m'=1}^{n_{it}} P_{ym't}^{1-\sigma_y})^{1-\sigma_y} = n_{yjt}^{\frac{1}{1-\sigma_y}} p_{yjt} \tag{5}$$

The migrant compares indirect utility of migration across countries ($v_{ji,t}^{l}$), described above as dependent on market conditions and migration costs. It follows that for the migrant to choose destination j, $v_{ij,t}^{l}$must exceed the utility of choosing another destination $v_{ir,t}^{l}$. The probability of migrating from country i to j is a logit function:

$$\mathrm{P}(\mu_{jj,t}) = e^{v_{jj,t-1}^{l}} \Big/ \sum_{r=1}^{R} e^{v_{jr,t-1}^{l}} \text{ and } \frac{\boldsymbol{\mu}_{ij,t}}{\sum_{j' \neq i} \mu_{i'j,t}} = e^{v_{ij,t-1}^{l}} \Big/ \sum_{r=1}^{R} e^{v_{ir,t-1}^{l}} - e^{v_{ij,t-1}^{l}} \tag{6}$$

This thesis further assumes that transport costs, which remain a function of distance, could decrease enough to permit farther markets in the global north retain their centripetal force even for migrants from Africa. If distance plays its centrifugal role, elasticity of substitution would be weaker for migrants originating from Africa vis-á-vis countries within closer distance. Second, it uniquely captures two other indicators of migration cost. One is networks, which are centripetal forces that ease migration costs through information and

resource sharing between migrants at a previous period and subsequent ones. Conversely, the absence of networks denotes centrifugal forces that increase transactional costs, relatively, for the migrant.

Networks are colonial ties interacted with the strength of links with destination, measured by remittance outflows from the destination country. Another migration cost is imposed by restrictive policy, which results from a destination country's deliberate interventions at controlling ease of entry, stay, integration and exit. This is a derived variable determined from the frequency of more restrictive major policy interventions of destination countries, which raise migration costs, acting as a disincentive to migration. Third, it relaxes the assumption of homogeneity in the agricultural sector as inconsistent with global south to north labour market conditions. These means that prices of agricultural sector inputs differ across regions.

In this thesis, the price index is expected to be higher for distant locations accounting for larger costs of importing goods and is the inverse of a market potential function. There are transportation costs ($\tau$), a positive constant measured by distance and alternatively OPEC oil prices. Beta and lambda are strictly-positive coefficients. The modified utility maximisation identity accounts for African networks and includes additional migration costs arising from restrictive policy. So, the worker's (l) maximises utility following:

$$\pi_{jt,t}^{l} = v_{jj,t}^{l} + \varepsilon_{i}^{l} = \ln(w_{j,t}p_{j,t}\,[d_{ij}\left(1 + bN_{ij}\right)^{-\lambda}] - p_{kj} + \varepsilon_{j}^{l}, j \in 1, R; \lambda > 0 \text{ and } b>0 \quad (7)$$

Workers' utility is driven by wages at the destination country ($w_j$). Furthermore, networks of migrants (N) at any destination (j) from any source (i) reduce migration costs, so that it is more feasible for migrants to move to where they already have a connection. Migration at any period (t) depends on previous migration from the same origin, which is captured in this research by remittances received from that origin.

The presence of a network between source and destination countries when considered an interaction with distance shows that spatial migration costs ($d_{ij}(1 + bN_{ij})$ rise with distance (d), this allows a measure of elasticity of distance to networks. $N_{ij}$ is an interaction between a binary and a continuous variable, which measures whether the countries, i and j, share colonial ties or a common language; or receive remittances from the destination

countries of interest (OECD-10). Further policy restrictiveness ($P_{kj}$) disaggregated by frequency of interventions capture constraints to entry, stay and work permits in increasing order. $P_{kj}$ measures whether destination country (j) has made a policy change by increasing its level of restrictiveness, k times. Where k is the category of policy restrictions ranging from one to three, in ascending order, so that PI measures only one more restrictive intervention, PII means between two to five changes and PIII captures the most frequent (greater than five) government measures to restrict mobility.

The price index effect leads to agglomeration. The worker (l) chooses to migrate from country i in region one (AFRICA-10) to country j in region two (OECD-10) if they perceive positive employment potentials at the destination. Migrants' [individual] perceptions of the characteristics of country of origin are captured in the error term. The share of migrants, who choose to move to a specific location relative to the total population of migrants is, $\frac{migrijt}{\sum j\prime \neq i\, migri\prime jt}$. The value depends on price indices for non-traded services, as well as manufactures and agriculture, the market potential function, the potential wages in the region, which is a function of expected wages and the ease of finding employment is also affected by the cost of migrating.

Using the free on-board price of a variety produced (eq 1), the equilibrium condition for each region (eq 2), the real wage of labour (eq 3), the CES price index for manufacturing and services (eqs 4 and 5) and the definition of indirect utility in eq 6 ($V_{ji,t}^{k}$), we can rewrite the share of migrants as:

$$ln(\frac{\mu_{ij,t}}{\sum_{j'\neq i}\mu_{ij',t}}) = \ln[\ (L_{j,t}^{y})^{\frac{\lambda}{\sigma y-1}}\ ] + \ln[\sum_{l=1}^{l=R} L_{l,t}^{X}\ (w_{l,t}\, d_{ij}^{\delta})^{1-\sigma_x}]^{\frac{\mu}{\sigma x-1}} + \ln[\ w_{j,t}^{1-\lambda} p_{j,t}] +$$

$$\ln d_{ij}\ (1 + bN_{ij}\ )]^{-\lambda} + \tilde{a}_{i,t} \qquad (8)$$

The left-hand side of the equation represents the share of migrants from source country (i) in country (j) as a fraction of all migrants from country (i). This share of migrants is an increasing function of labour supply in services (y) and manufacturing (x); wage potential (w) which depicts the impacts of nominal wages interacted with employment opportunities; and networks (N). In addition, the share of migrants at any destination is a decreasing function of labour immobility represented by distance (d). Labour supply at the destination

country j at time t rises in conditions of imperfect competition depicted by lambda and elasticity of substitution of inputs in the service sectors ($sigma_y$). Economies of scale in the manufacturing sector is influenced by share of expenditure on manufactures (mu) and elasticities of substitution in the manufacturing sector ($sigma_x$). The economies of scale reflect in wages as well as the magnitude of impact of distance and rises by a magnitude delta where there are networks between source and destination country. Networks influence distance elasticity of migration at a magnitude of lambda.

The characteristics of the migrant from country (i) are captured in the error term given as:

$$\tilde{a}_{i,t} = \ln \left(\sum_{r=1}^{R} e^{v_{ir,t}^{l}} - e^{v_{ij,t}^{l}}\right)$$

A schematic representation of the theoretical framework of the New Economic Geography (NEG) theory is shown in Figure 4.1. It describes the forces that impact upon migration from Africa and the expected magnitude of impact. The schema shows determinants of the proportion of migrants from each African country at any one OECD-10 destination as a fraction of all migration from that source country at a linear and a non-linear level. The determinants are split into centripetal forces which are market attractions that incentivise migrants to a certain destination and centrifugal forces that increase the cost of migration, consequently deterring migrants.

At the first level is a linear representation capturing both centripetal and centrifugal forces. In the case of centripetal forces, there is a direct relationship between share of migrants at any destination and centripetal forces made up of market size, market concentration and productivity (see Krugman, 1991). Selected variables may represent one or more of these general centripetal forces. In this thesis, wages depict market concentration or the agglomeration of labour as a factor of production at a particular destination; at the same time wages also reflect productivity. In other words, earned wages are higher for those who are more productive, and this could exhibit a spatial structure if productivity is associated with geographical local in Marshallian location effects (see Krugman and Obstfeld, 2009). A higher receiving country labour supply should deter migration to that destination, especially for manufactures and services which reflect higher productivity than the traditional sector (see Crozet, 2004). Networks also facilitate thick markets in which

existing migrants could ease the migration processes for others by pooling migration costs and sharing information. In addition, large market size depicted by population and geographical size are positively associated with migrant concentration since there is likely to be better access to inputs as well as better markets conditions for the distribution of outputs.

In the case of centrifugal forces, the theory shows that restrictions to labour mobility obstruct migration to any given destination. Transportation costs are the most cited form of mobility restrictions and these rise with distance (for example Lafourcade and Thisse (2008). A less researched contravening force is restrictive policy, which could be particularly important in depicting African migration patterns because fewer labour market agreement exist between Africa and the OECD-10 (see DEMIG, IMI, 2015). In addition, the DEMIG dataset (IMI, 2015) migration quotas, and even if they have become transferable between regions in many countries, African migrants tend to use up their quotas.

At the second level is the cumulative impacts that could arise for the linear determinants for instance through externalities (see Coniglio 2002; Crozet, 2004). Networks reduce migration costs (Gonzales-Garcia, 2016, Adepoju, 1996) and as measured by λ, could diminish the impact of distance (Crozet, 2004), the latter is a deterring force of migration. Where there are already networks of migrants at a particular destination, they may decide to fund part of a potential migrants' trip or help with job seeking and other information that reduces transactional costs.

The elasticity of substitution between inputs ($\sigma$) as well as the expenditure share on goods signifies the presence of economies of scale for firms, which is characterised by higher returns to those inputs. Given that increasing returns to scale tends to perpetuate imperfect market conditions that attract migrants, the effects of these determinants are considered non-linear and can scale up the impact of centripetal forces. These externalities of destination markets cause more migrants to concentrate where they exist. The non-linear scalars do not operate in isolation of the linear determinants of migration. In other words, non-linear scalars interact with linear factors to determine the magnitude of impact of the centripetal and centrifugal forces.

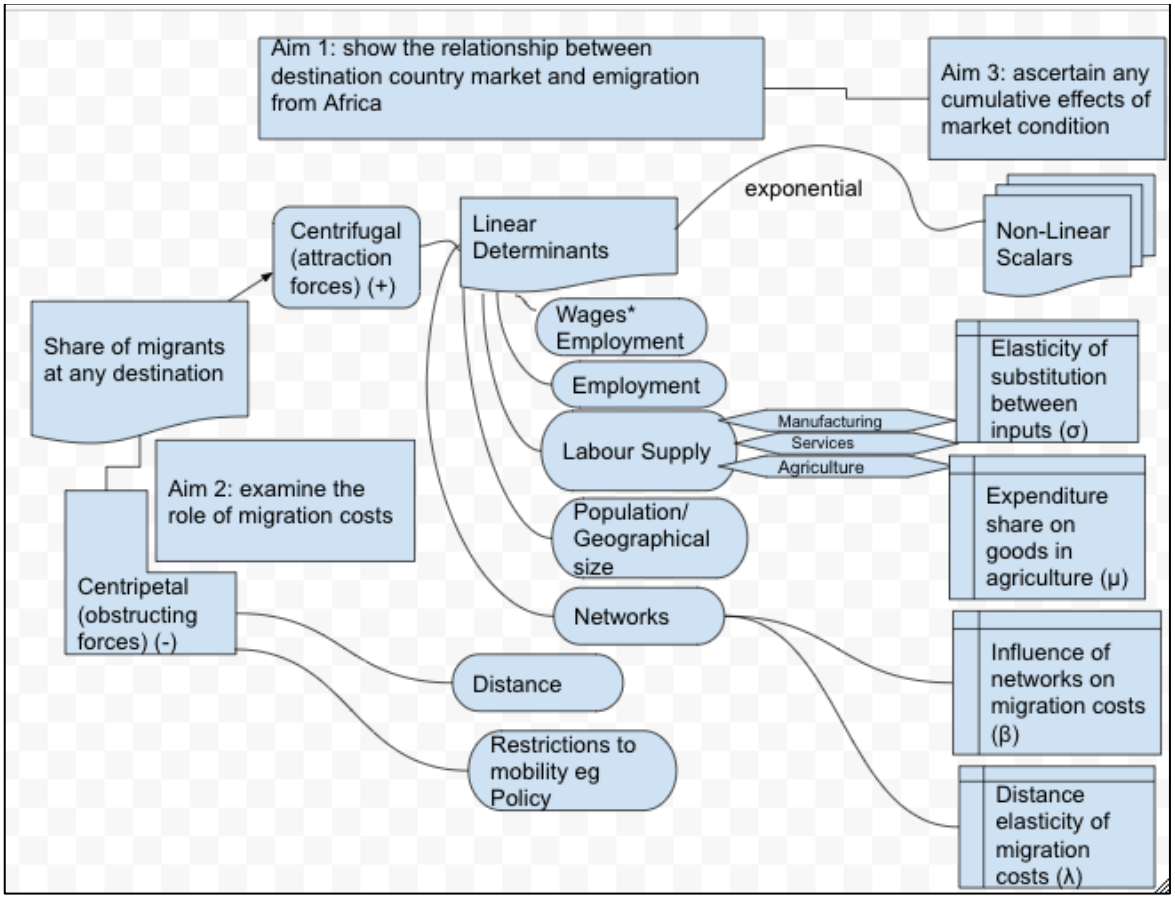



**Figure 3.1: A Schematic of the Determinants of Migration Patterns**

**Source:** Author's depictions from the literature review

## 3.2. Methodology

This sub-section discusses in sequence issues concerning the data utilised for this analysis; the methodological framework and estimation technique. The data is further described in Tables 3.1 and 3.2 of this section.

### 3.2.1. Data types and sources

#### Migration data

The World Bank Global Bilateral Estimates of Migrant Stock is a matrix showing the total number of emigrants from each source to the corresponding destination country, decennially from 1960 to 2010, and afterwards for the years 2013, and 2017. The World Bank data captures migrants defined as foreign born, that is, persons living in countries other than their places of birth. On net migration rates, which are total number of immigrants less emigrants, including citizens and non-citizens, the United Nations Population Division and World Population project reports data every five years starting 1960. The UNDP also reports migration stock every five years. This migrant stock data is also disaggregated by gender and by level of education for 1990 and 2014. However, these are less suitable for computation than the bilateral absolute values given that in a significant number of years, data is missing for Africa.

Methodologically, the absolute value of migrants is a more suitable representation of migrant distribution than the rate of migration. In addition, because the Global Bilateral Migration Database (World Bank, 2018) shows migration from any source country to any receiving country, it permits the type of analysis embarked upon in this thesis where we examine the concentration of migrants at any destination.

#### Data on Market Size, Concentration, and Productivity

The NEG focuses on markets attraction as a major explanation for migrant distributions. Total labour supply at the destination, nominal wages and employment data refer to the OECD-10 destinations. Wages are the annual average wages of OECD countries; and labour

employment data on OECD are retrieved from the OECD Statistical database available online (OECD, 2018). The same database (OECD, 2018) provides total employment as well as employment by [sectoral] activity. The OECD statistical database is the most comprehensive list of destination market variables, and the dataset is consistent in terms of direction of change, with country-by-country statistical databases.

Population data have been retrieved from the World Development Indicators (WDI, 2017). Remittances are from the World Bank, 2018 Bilateral Remittances Matrix and World Development Indicators, 2017. The area of host country, retrieved from United Nations Statistics Division (UNSD, 2018), along with population of destination countries, capture the centripetal effects of market size, as larger territories tend to have more opportunities and less out migration. While there are various population size estimates, it is important that the measurement indicator be consistent for all ten destination countries in the data panel; hence, the choice of a dataset that covers all these receiving countries.

Networks are captured in two methods and then interacted to form a single variable. First, African countries of origin that have previously been colonised by specific destinations or have common language or religious/cultural ties are considered as having a network, which is generated by the author of this thesis as variable in binary form.[22] This derivation is important to capturing African specific historical ties in order to improve the accuracy of the results. Second, remittance outflows from destination countries are collected from the WDI (2017) and serves as a proxy for networks. Bilateral remittances are from the World Bank Global Bilateral Remittance Database (GBRD, 2018) which captures country to country's remittances further enhancing our preliminary discussions. The earliest period of collection of the GBRD (2018) is 2010 so that insufficient time periods of the data existed at the time of this analysis.

**Migration cost data**

The distance between capital cities is from Gleditsch, Kristian and Ward (2001) database and common border. It is constant in time but varies across series and captures the effect of geographical distance on choice of destination. Organisation of Petroleum Exporting

[22] Please see Appendix for table showing construction of the binary variable

Countries' (OPEC, 2018) oil prices are average prices per barrel in USD. It is one of the certified sources of distance data and it is important to use study because it estimates distance between cities, an important feat in measuring destination choice of migrants since larger markets are ordinarily located in cities.

Policy data is sourced from the Determinants of International Migration policy database (DEMIG) of the International Migration Institute (IMI, 2015).[23] It is a change-tracking database, which focuses on Post-World War II national (not regional or sub-regional) migration policy in 45 countries, including all of those investigated in this research on African migration flows to the global North.

The DEMIG dataset weighs policy change by various indicators, two of which are adopted for this thesis. First, by magnitude of change, that is whether the policy underwent a major, mid-level, minor or fine-tuning modification; and second, the degree of restrictiveness, measures whether the respective change permitted more people to access the country or was more restrictive to migration.[24] Policy changes do not occur annually, in years in which they do occur there may be multiple changes, some more and others less restrictive, and periods of occurrence for major, mid-level, and minor may coincide but more often do not coincide. This index is a relative measure that as stated by the authors who computed it, allows a comparison of policy restrictiveness between the countries of study, rather than predict which country is overall less open in absolute terms. More restrictive in this thesis uses categorical variables of major restrictive policy change derived from the determinants of international migration (DEMIG) policy database. If more restrictive major policies exist in a year, that period is represented by one. The policy measure adopted also excluded

[23] The Determinants of International Migration Policy database (DEMIG) (IMI, 2015) is the most comprehensive in scope (captures 45 countries) and all migrant population groups. It also extends the time, measuring policy changes from the early 19th century but mostly between 1945 and 2013. The author's paper on the database, that is De Haas *et a*l (2015), mention that the focus is on *paper policy* that they defined as those that have already been passed and mention but do not code by level of restrictiveness the policy discourses and implementation. This improves objectivism on reporting policy change but implies that migrants' responsiveness to signals resulting from policy debate are not captured.

[24] For instance, a major change would be introducing new procedures for citizenship or labour market requirement, an example of mid-level change would be limitations on access to citizenships by one generation born outside Canada (2009), a minor change such as a decrease in former immigration quotas, or increase in powers of immigration officers and a fine-tuning is in relation to previous policies such as more strict labour market criteria, for example in 2013, Canadian work experience was included as a requirement for skilled workers.

restrictive changes targeted at specific nationalities, if they fall outside the countries of interest in the thesis. The policy measure is the most comprehensive, and allows us to avoid subjective interpretations that might arise from determining which policy is more restrictive.

### 3.2.2. Model Specification

**Model 1: The gravity model**

Equation (8) depicts a simple gravity equation in which migration to a destination as a function of all migration from that source declines as the distance between origin and destination increases but rises with destination country size. In addition, market factors at the destination such as sectoral employment in manufacturing (x), service (y), and agriculture (z) and networks (N) determine the volume of migration. A reduced form of equation is specified to represent whether destination country markets including wage potentials (probw) attract migrants and the extent to which centrifugal forces of distance, restrictive policy, deter migration. It allows a simplified estimation of the postulates of the NEG framework.

The gravity equation to be estimated is:

$$\log\frac{migr_{ijt}}{\sum_{j\prime\neq i} migr_{ij\prime t}} = \beta_1 \log(L_{zj(t)}) + \beta_2 \log(L_{xj(t)}) + \beta_3 \log(L_{yj(t)}) + \beta_4 \log(probw_{j(t)}) + \beta_5 \log(S_{jt}) + \beta_6 \log(d_{ij}) + \beta_7 \log(N_{ij}) + a_j + u_{ijt} \quad (9)$$

Where the left-hand side of the equation shows the migration between country (i) and (j) divided by the total stock of migrants from country (i). $L_j$ is the total labour employment in destination (j) by agriculture (z), manufacturing (x) and service (y) sector; probw represents earnings potential, which is derived as the product of nominal wage and employment rate. $d_{ij}$ is the bilateral hub and spoke distance between capital cities in country (i) and (j). $N_{ij}$ measures network effects through one of language proximity, and/or colonial/historical ties as well as labour agreements. It is interacted with remittance outflows from the destination country; therefore, it is expected to have a positive effect on migration. $S_j$ is the surface area of the destination country, and the linear equation is proxied by total population at the destination in order to avoid multicollinearity problems. The country trend and fixed effects of destination countries are captured in the term ($a_j$) and fixed effects relative to African

countries as well as trend is represented in an error term ($u_{ijt}$) that captures destination and source country unaccounted variables in time, (t). The characteristics of the migrant are represented by the subscript (i) and (j) as they can vary across locations. Given missing data on policy restrictiveness after 2014, the first equation is estimated for the full period of 1990, 2000, 2010 and 2017 without policy change. A second equation covering a shorter period ending in 2014 introduces the effects of policy. The modified version of equation 9, which includes policy variables to be estimated is:

$$\log\frac{migr_{ijt}}{\sum_{j\prime\neq i} migr_{i\prime jt}} = \beta_1 \log(L_{zj(t)}) + \beta_2 \log(L_{xj(t)}) + \beta_3 \log(L_{yj(t)}) + \beta_4 \log(probw_{j(t)}) + \beta_5 \log(S_{jt}) + \beta_6 \log(d_{ij}) + \beta_7 \log(N_{ij}) - \beta_8 \log(PI_j) - \beta_9 \log(PII_j) - \beta_{10} \log(PIII_j) + a_j + u_{ijt} \quad (10)$$

$P_{kj}$ is a vector of policy measures showing frequency of magnitude of policy change at least one change (PI), two to five interventions (PII) and more than five more restrictive interventions (PIII). Each policy variable measures policy restrictiveness independently in binary form (less (0) or more (1) restrictive).

**Model 2: The Helpman non-linear form model**

This thesis also estimates specific parameters of market potential (mu, lambda and beta) expressed in the equation (11) that also derives from equation (8). The equation (11) that follows, solves for the share of migrants at a destination (j) as a proportion of the total migration from the location (i) by measuring forward linkages otherwise called cumulative effects á la Crozet (2004). These workers are mobile and endowed with one unit of labour. Agglomeration arises from an increasingly important manufacturing sector, transportation costs low enough to serve the periphery from the core and economies of scale (see Krugman, 1991; Schmutzler, 1999). Variations to the Helpman model initially identified by Coniglio (2002) and Schmutzler (1999) arise in this thesis through the fragmentation of centrifugal forces, to include migration costs measured using transportation, and migration policy as barriers to mobility.

Noticeably, the option that transportation costs are changing and, therefore, not linearly associated with distance means they may also feature as a non-centrifugal force. The role

of migration costs will depend on the sign that the variable carries in empirical evidence. Further, Krugman's assumption that technology and resources are homogenous is relaxed as inconsistent within the south-north context examined in this thesis. Specifically, the model to be estimated modifies Crozet (2004) by extending regional prediction of market forces to migration across continents, between Africa and the global north, through the introduction of the impact of migration costs. Adjusting Crozet (2004) to account for migration costs, we set up a modified non-linear model ensuing from eq. 8, which measures the share of migrants from a given country (i) who have decided to move to a country (j).

The economy operates with three sectors. The non-linear NEG á la Helpman is applied to obtain the elasticity of substitution ($\sigma$) and the expenditure share of manufactured goods ($\mu$). The parameters $\sigma, \mu, \lambda, b$and $\delta$ capture cumulative effects of migration flows, particularly impacts of surrounding markets (services) measured by the first two parameters in addition to the pull of local supply of goods. In this way, our regression captures whether migration flows are responsive to specific market characteristics represented in the scalar $\sigma$. In accordance with the theoretical framework anchored on the NEG, the Helpman model to be estimated is:

$$\log \frac{migr_{ji,t}}{\sum_{l \neq j} migr_{jl,t}} = \frac{\mu}{\sigma_x - 1} \log[\sum_{l=1}^{l=R} L_{l,t}^{x} \ (w_{l,t}(d_{il})^{\delta})^{1-\sigma_x}] + \alpha_1 \log \left(L_{i,t}^{y}\right) +$$
$$+ \alpha_2 \ log \ (probw_{i,t}) - \lambda \ log \left(d_{ij}(1 + \ bN_{ijt}\right) + \alpha_3 \log(S_j) - \ \alpha_4 \log(p_{kj}) + a_j +$$
$$\alpha_5 \log(trend) + v_{ijt} \qquad (11)$$

Policy has decreasing effects on migration, but the converse is the case for networks, so that policy impacts are distinctly represented rather than interacted with networks.

### 3.3. Estimation techniques

The fixed and random effects techniques were applied to estimate the panel data of destinations for each individual (source) country, using the GLS variant to solve the linear and non-linear models following Crozet (2004). The choices of which of the mixed effects techniques to use was resolved using a Hausman model specification test. The mixed effects techniques helped control for time specific factors across the panel of ten destinations, since the method accounts for time-invariant independent variables. The model focuses on forward linkages that drive the location choices of individuals to where markets are and

includes the negative effects of migration costs, which are policy restrictiveness and distance. These destination country markets are expected to have specific characteristics that cause variation from the sample mean between the OECD-10 countries as well as variations from the individual country average mean, that are accounted for through fixed and random effects techniques.

### 3.4. The expected relationships between the variables

The main testable predictions established are that migration between origin country (i) and destination (j) is affected by market size, concentration and productivity at destination and migration costs measured in distance, and policy costs. Table 3.1 and 3.2 define the variables and data source and include the expected direction of impact.

Migration improves with networks as information about destination and more accurate country conditions result from viable connections built between destination countries' residents and potential migrants. Higher expected wages pull more workers to any given destination. Workers real income is also lower in regions offering fewer services. Migration flows are higher for larger countries with lower geographical distances between them, so that size and population signal market attraction and are positively related with migration. Larger regions are also expected to attract more workers, so beta is strictly-positive.

The policy restrictiveness variable assumes that more restrictive policy increases the cost of migration. It is assumed that the distance within countries only requires a proxy as migrants would arrive at the closest city most often the destination city of work, especially since it is industrial cities that attract workers. Transportation costs rise with distance between source and destination countries, and the more restrictive the policy, the higher related transactional costs of getting additional documentation or qualifications towards meeting new rules. The fixed effects ($a_j$) are expected to be negative.

**Table 3.1: Description of variables and expected relationship with migration**

| | Variable | Dataset, Year | Unit of Measurement | Expected Relationship | Description |
|---|---|---|---|---|---|
| Variables measuring migration size, concentration, and productivity | Total labour employment (L) at destination, disaggregated by sector into manufacturing (x), services (y) and agriculture (z) | OECD statistical data, 2018 | Thousands of Persons | + | Migration increases with opportunities at destination. This varies captured fixed country effects of various destinations. |
| | Nominal wage | | USD | +/neutral | Wages attract more migrants to a certain destination some studies have found the wage pull overestimated. |
| | Employment | | Thousands of Persons | + | Employment possibilities also positively affect migration disaggregated by sector. Probw interacts wages and employment rate |
| | Surface area of host country (S) | UNSD, 2018 | Squared km | +/- | Larger countries are on the average less migratory as they find more market opportunities within than smaller ones. Larger host countries tend to have more employment opportunities. |
| | Population | WDI, 2018 | Units/Number of People | + | Given that surface area is constant in time but varies across series (countries), it is proxied by population. |
| Migration costs | Distance (d) | Gleditsch, Kristian and Ward database and common border, 2011 | Squared km | +/neutral | Transport costs are an increasing function of distance. Migration decreases with distance given but the overall effect may be offset by market attraction, which neutralizes the magnitude of the distance costs. |
| | Common Networks (N) proxied by remittance outflows from destination (j) | World Bank Global Bilateral Migration Database, 2018 | USD | + | Networks reduce the cost of migration through information sharing; as well networks provide financial edges through their pooled resources, including accommodation sharing. Conversely, networks of migrants at a destination may discourage others from joining them when opportunities decrease at destination, the latter may be associated with policy change. Colonial ties and common language indicate an initial connection between i and j. |
| | Policy restrictiveness $P = \sum_1^3 P$ $P_1, P_2, P_3$, are major level changes in policy restrictiveness based on frequency of restrictions | Determinants of International Migration Database (DEMIG), 2015 | Binary value | +/- | Policy restrictiveness contributes to migration costs and major changes in restrictiveness are expected to deter future migration more than minor policy modifications. |

Source: Retrieved by author from datasets described in this table

**Table 3.2: Definition of parameters and expected values**

| | Description | Expected Relationship | Sign |
|---|---|---|---|
| $\sigma$ | Elasticity of substitution (between x of manufactured good, y services, or z agriculture) | The lower the elasticity of substitution the higher the economies of scale. | Always strictly positive and in theory superior to 1. |
| $\sigma/\sigma-1$ | Impact of local service supply | In equilibrium this is the ratio of average to marginal costs. This variable measures economy of scale. | Positive but less than one |
| $\mu$ | The expenditure share on goods in agriculture (z) | Values closer to 1 predict economies of scale | Positive |
| $\lambda$ | Parameters capturing migration costs | Distance elasticity of migration costs | Strictly positive coefficients |
| b | | Influence of networks on migration costs | |
| $\delta$ | Elasticity of trade costs to distance | | Positive |

**Source:** Modified from migration literature with a focus on Crozet (2004)

# CHAPTER FOUR

# PRESENTATION AND DISCUSSION OF RESULTS

## 4.1 Data presentation on African migration distribution

This thesis examined how destination country market size, market concentration and productivity as well as migration costs determined the distribution of migrants from ten African countries to ten global north destinations. Market attraction of destination countries is measured by labour employment, disaggregated by sector, wage potential (nominal wages multiplied by employment rate), networks, and size of destination country, which is proxied by population. Migration costs are reflected in distance, and restrictive policy.

Preliminary analysis reveals that countries with high migration rates to the OECD are lower middle-income ones such as Nigeria (54%) and Cameroon (51%) and low-income Kenya (66%).[25] The only Least Developed Country (LDC) with high migrant stock in the OECD is Gambia (68%).[26] All other LDCs have less than 10 per cent migration to the OECD including Benin, Burundi, Burkina Faso, Chad, Eritrea, Lesotho, Mozambique, and Niger.

Apart from larger wage discrepancies between the global north and Africa that serve as an incentive to migrate, in the 1990s, according to Adepoju (2006), declining economic conditions, in Nigeria, shifted its position from a net receiving economy to a sending economy within the Economic Community of West African States (ECOWAS); and unemployment remains a significant driver of migration from Africa (Adepoju, 2017).

[25] Data is presented in appendix 1

[26] The migrant stock according to the Vargas-Silva (2014) is 'the total number of foreign-born residents (for most countries) or foreign nationals (for 20% of countries)'.

Migrants from Africa increasingly go to previously common destinations viz. Canada, France, Germany, United Kingdom, and United States (OECD-5). Observably, African migrants have been moving to new destinations discovered after 1960. Senegalese, for instance, started migrating to Italy and Spain in the 1990s, (see Robin, 1996 cited in Flahaux, 2014). Similarly, the data revealed that from 1970, the locations that emerged with over 500 migrants each are Netherlands, Norway, Spain, Sweden and Switzerland, labelled in this present study as OECD-N.[27] All of these countries, it is discernible from Eurostat (2014) data, have declining working age population and high employment rates with the exception of Spain, where unemployment remains relatively high.

Although African migrants travelled all over the world, as at 1990, there were still some new destinations in the global north for selected African countries. This thesis regards Spain as a typical emerging destination, as it only became a net-immigration country in the 1990s. Among the African countries considered, referred to in this thesis as AFRICA-10, documented migration flows to Spain had originated only from Morocco before 1990 (see Table 4.2). The emerging destinations arranged by spread of new African migrants are Netherlands, Turkey, Latvia, Czech, New Zealand, Ireland, Iceland, Bulgaria, Finland, Serbia, Austria, Switzerland, Greece, Norway, Macedonia and the United States (see appendix 2). Every African country has migrants in at least one new location. Taking Nigerian for instance, the new locations after the 1960s are Czech, Finland, Slovenia, Spain, Sweden, and Turkey.

The array of tables labelled Table 4.1 shows the distribution of migration from Africa to the global north in ten-year periods between 1960 and 2010 as well as for the year 2017. Migration has increased from Africa to the global north over time. In particular the volume in the OECD-N countries has risen, with a significant growth in migration since the 1990s, although still smaller in magnitude compared to OECD-5. This is particularly so for origin countries within closer proximity to Europe, such as Morocco. Migration from Morocco reflects both networks and geographical distance, since the intensity is stronger in France and Spain, relatively less in the United Kingdom, and much smaller at more distant United States. Egypt shows comparatively less influence of distance, with more of its migrants in

[27] A list of emerging migrant destinations for Africa since the 1970s is presented in Appendix 1.

the US. The United Kingdom is only second in magnitude despite colonial ties with Egypt, followed by Canada.

Most of the migrants from Southern Africa are also in the UK and US, although Canada similarly features strongly. Migration from Botswana to the OECD-N began only in the 1980s. Malawi has similar later start towards the OECD-N, except for emigration to Sweden [from Malawi] which started in 1970. Similarly, migration from the Islands to some OECD-N destinations, namely Netherlands, Norway, and Sweden only commenced in the 1980s. Netherlands, followed by Spain, is the new destination with the most significant migration growth from Africa since the 1960s. Among the OECD-N, Spain has peculiar unstable migration patterns from Africa-10, especially for Eastern Africa (Kenya and Malawi), South Africa, and the Islands (Mauritius and Seychelles). The other origins show steady rise in migration since the 1980s and 1990s.

There has been rapid decline in migrant stock from the Islands since 2010 and a less significant decline from Kenya over the same period. Cases such as Malawi vis-á-vis Kenya or Botswana and South Africa, where countries migrant stock vary in relation to national income status, emphasise how differences in income affect financial capabilities to move. Botswana, a land-locked economy with rapid growth, small population of about 2.2 million as at 2017, shows significant fluctuation in migration stock particularly to OECD-5 (OECD Stat, 2015).

Conversely, similar migration volumes originate from Egypt and Morocco; or Ghana and Nigeria, regions where economic conditions are similar. While migration from Africa to the United States has grown significantly, for countries such as Botswana, Ghana, Nigeria and Malawi, there has been a brisk decline since 2010. Migration between various African countries and other core destinations such as Germany, except in the case of Malawi, grew steadily.

The next important countries in terms of magnitude of emigration are Nigeria and Ghana, where migrants numbered 2,195,479 and 1,445,517 respectively, between 1960 and 2017. The distribution of African migrants across the global north core destinations (OECD-5) and emerging destinations (OECD-N) varies widely. The largest proportion of South Africans (55%) migrated to the United Kingdom (UK); and the second largest (22%)

migrated to the United States of America (USA), while the least proportion (0.35%) migrated to Norway. The largest proportion of Nigerians migrated to the USA (47%); the second largest proportion (35%) migrated to the UK, while the least proportion (0.23%) migrated to Norway. Nigeria's pattern of migration is similar to that of Kenya with a high concentration of migrants in the OECD-5. However, while both countries record the highest number of migrants to the USA, Nigerians are more evenly distributed across the OECD-5.

There is some migration dispersion especially from Nigeria to Spain and the Netherlands, but for both Nigeria and Kenya, the lowest proportions of migrants in OECD-N are in Norway. United Kingdom (UK) is also the highest destination of migrants from Mauritius; a country which has the larger volume of migrants between the two selected African Islands. Specifically, UK is the destination of about 44 per cent of Mauritius migrants; 29 per cent of the migrants migrated to France, while the least proportion (0.19%) migrated to Sweden. In the case of Mauritius, networks are visible as well, and migration to France by far exceeds more distant US, in contrast with Seychelles where migration to the United States is more significant.

The relatively lower cost of migration may be responsible for the wide disparity in the distribution of migrants from Morocco, which has the largest migrants in the whole of Africa. Unlike many other African countries, the destination of the largest proportion (48%) of migrants from Morocco is France. This was followed by Spain (29.5%), while they rarely travel to Norway as is the case for Nigerian, South African, and Kenyan migrants. This reflects networks between Morocco and its former colonies, France and Spain, as well as relative geographical proximity to Spain.

Eastern African migration is strongly associated with networks in the United Kingdom, particularly for Kenya, and migration to the US and Canada is significant in magnitude. The migration intensity from Western Africa is the most evenly distributed among the series; and there is symmetry in intensity of migration to France, Canada, UK and US. For the Islands, migration to the United Kingdom is the most prominent, and Canada also features significantly. Huge variations in migration from low-income countries like Malawi show that migrants struggle to move when they lack the financial capabilities, even in the presence of networks. This is so for Botswana and Malawi that have relatively lower migration flows

than the rest of the Africa-10, both landlocked, with Malawi classified as low income while Botswana has a small population. Their migration patterns fluctuate significantly, for instance to Canada, and in the case of Malawi to Germany where it falls in the 1980s.

**Table 4.1: Distribution of migration from Africa to various destinations in global north, 1960 to 2017**

| | Southern Africa | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Country** | **Botswana** | | | | | | | | | **South Africa** | | | | | | | | |
| **Year** | **1960** | **1970** | **1980** | **1990** | **2000** | **2010** | **2013** | **2017** | **Sum** | **1960** | **1970** | **1980** | **1990** | **2000** | **2010** | **2013** | **2017** | **Sum** |
| Canada | 19 | 109 | 202 | 104 | 194 | 252 | 444 | 444 | 1768 | 3915 | 7099 | 10492 | 21654 | 36613 | 47470 | 46187 | 47152 | 220582 |
| France | 46 | 111 | 0 | 1 | 78 | 195 | 44 | 44 | 519 | 6163 | 14771 | 113 | 196 | 10398 | 3409 | 4982 | 5258 | 45290 |
| Germany | 1 | 1 | 1 | 53 | 26 | 149 | 251 | 505 | 987 | 123 | 1456 | 2820 | 2409 | 5280 | 8027 | 10865 | 18428 | 49408 |
| United Kingdom | 2399 | 154 | 341 | 167 | 883 | 2717 | 2765 | 2880 | 12306 | 46296 | 48980 | 55516 | 77458 | 143298 | 225856 | 214009 | 245000 | 1056413 |
| United States | 40 | 89 | 914 | 386 | 2383 | 1922 | 708 | 708 | 7150 | 5724 | 12349 | 23096 | 42299 | 68041 | 81142 | 101959 | 94141 | 428751 |
| Netherlands | 0 | 0 | 0 | 0 | 175 | 211 | 227 | 241 | 854 | 5 | 853 | 2358 | 6795 | 11346 | 12325 | 13406 | 13918 | 61006 |
| Norway | 0 | 0 | 13 | 36 | 84 | 135 | 124 | 119 | 511 | 250 | 380 | 538 | 645 | 766 | 1139 | 1411 | 1509 | 6638 |
| Spain | 0 | 0 | 0 | 15 | 9 | 35 | 52 | 90 | 201 | 0 | 0 | 0 | 2033 | 1107 | 2602 | 2485 | 2799 | 11026 |
| Sweden | 0 | 0 | 2 | 4 | 48 | 68 | 107 | 110 | 339 | 330 | 125 | 275 | 515 | 1005 | 1706 | 2278 | 2515 | 8749 |
| Switzerland | 0 | 0 | 1 | 0 | 13 | 26 | 74 | 72 | 186 | 36 | 24 | 114 | 88 | 1192 | 5097 | 7521 | 7749 | 21821 |

| Northern Africa | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Country** | **Egypt** | | | | | | | | | **Morocco** | | | | | | | | |
| **Year** | **1960** | **1970** | **1980** | **1990** | **2000** | **2010** | **2013** | **2017** | **Sum** | **1960** | **1970** | **1980** | **1990** | **2000** | **2010** | **2013** | **2017** | **Sum** |
| **Canada** | 1627 | 9164 | 17045 | 26011 | 35874 | 47234 | 47302 | 58058 | 242315 | 584 | 3302 | 6145 | 15288 | 25307 | 45465 | 46056 | 65436 | 207583 |
| **France** | 3000 | 7189 | 18606 | 20919 | 5060 | 28024 | 30413 | 31407 | 144618 | 155574 | 294994 | 540819 | 654248 | 262462 | 840985 | 927737 | 940552 | 4617371 |
| **Germany** | 2111 | 5224 | 9577 | 7609 | 14208 | 20892 | 19013 | 23428 | 102062 | 9431 | 11846 | 54042 | 50126 | 84619 | 108442 | 123589 | 98000 | 540095 |
| **United Kingdom** | 23283 | 2545 | 24031 | 25289 | 26975 | 28102 | 30289 | 33000 | 193514 | 4317 | 15743 | 5958 | 10364 | 20878 | 12490 | 23080 | 27000 | 119830 |
| **United States** | 8884 | 30520 | 52431 | 79861 | 118619 | 132513 | 171985 | 181677 | 776490 | 1257 | 1943 | 16363 | 24311 | 40177 | 84496 | 69126 | 80384 | 318057 |
| **Netherlands** | 2 | 765 | 2117 | 6102 | 9381 | 11301 | 12526 | 13205 | 55399 | 27 | 15355 | 42489 | 122444 | 151254 | 167355 | 173489 | 168475 | 840888 |
| **Norway** | 53 | 104 | 186 | 296 | 393 | 679 | 995 | 1111 | 3817 | 111 | 450 | 1155 | 2437 | 3808 | 6123 | 4892 | 5673 | 24649 |
| **Spain** | 0 | 0 | 0 | 882 | 1631 | 4185 | 4073 | 5004 | 15775 | 24997 | 42164 | 72226 | 105884 | 253173 | 778451 | 773800 | 786598 | 2837293 |
| **Sweden** | 115 | 61 | 134 | 1321 | 2062 | 2823 | 5396 | 6256 | 18168 | 22 | 761 | 1579 | 2560 | 4443 | 6242 | 8576 | 9480 | 33663 |
| **Switzerland** | 343 | 94 | 470 | 349 | 1710 | 5010 | 6340 | 6359 | 20675 | 8176 | 2255 | 11409 | 8403 | 5950 | 10580 | 17229 | 17562 | 81564 |
| **Total** | 39418 | 55666 | 124597 | 168639 | 215913 | 280763 | 328332 | 359505 | 1572833 | 204496 | 388813 | 752185 | 996065 | 852071 | 2060629 | 2167574 | 2199160 | 9620993 |

| | Western Africa | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Country** | **Ghana** | | | | | | | | | **Nigeria** | | | | | | | | |
| **Year** | **1960** | **1970** | **1980** | **1990** | **2000** | **2010** | **2013** | **2017** | **Sum** | **1960** | **1970** | **1980** | **1990** | **2000** | **2010** | **2013** | **2017** | **Sum** |
| **Canada** | 595 | 3371 | 6273 | 3436 | 16586 | 21920 | 22211 | 24718 | 99110 | 1240 | 6964 | 12950 | 1909 | 10348 | 17118 | 19325 | 32118 | 101972 |
| **France** | 1375 | 3296 | 25 | 3589 | 2320 | 4985 | 6710 | 171428 | 193728 | 3892 | 9329 | 2152 | 1919 | 6567 | 2920 | 5394 | 5854 | 38027 |
| **Germany** | 464 | 1182 | 14388 | 12448 | 22996 | 34153 | 31237 | 33000 | 149868 | 358 | 1825 | 3865 | 2911 | 15492 | 22987 | 29878 | 25000 | 102316 |
| **United Kingdom** | 5581 | 880 | 17290 | 34132 | 6139 | 96795 | 81917 | 87000 | 329734 | 15725 | 29796 | 32060 | 51154 | 106221 | 150918 | 184314 | 190000 | 760188 |
| **United States** | 1049 | 2496 | 9872 | 23957 | 68432 | 110931 | 149596 | 171428 | 537761 | 3141 | 5885 | 31976 | 69384 | 141571 | 210647 | 252172 | 306874 | 1021650 |
| **Netherlands** | 1 | 905 | 2505 | 7219 | 10873 | 12123 | 14175 | 13990 | 61791 | 3 | 256 | 706 | 2034 | 4097 | 5490 | 7002 | 7089 | 26677 |
| **Norway** | 4 | 14 | 36 | 746 | 1073 | 1703 | 1815 | 1962 | 7353 | 11 | 28 | 133 | 311 | 424 | 745 | 1598 | 1795 | 5045 |
| **Spain** | 0 | 0 | 0 | 454 | 2573 | 14684 | 15202 | 16006 | 48919 | 0 | 0 | 0 | 370 | 7256 | 38775 | 35872 | 35550 | 117823 |
| **Sweden** | 0 | 28 | 61 | 115 | 970 | 1441 | 2421 | 2663 | 7699 | 0 | 79 | 174 | 325 | 693 | 1130 | 3951 | 4669 | 11021 |
| **Switzerland** | 279 | 76 | 377 | 284 | 1244 | 1853 | 2733 | 2708 | 9554 | 191 | 52 | 260 | 194 | 1389 | 1664 | 3451 | 3559 | 10760 |
| **Total** | 9348 | 12248 | 50827 | 86380 | 133206 | 300588 | 328017 | 524903 | 1445517 | 24561 | 54214 | 84276 | 130511 | 294058 | 452394 | 542957 | 612508 | 2195479 |

| | Eastern Africa | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Kenya | | | | | | | | | Malawi | | | | | | | | |
| **Year** | **1960** | **1970** | **1980** | **1990** | **2000** | **2010** | **2013** | **2017** | **Sum** | **1960** | **1970** | **1980** | **1990** | **2000** | **2010** | **2013** | **2017** | **Sum** |
| **Canada** | 500 | 2836 | 5279 | 12187 | 20230 | 26164 | 26657 | 28502 | 122355 | 26 | 149 | 278 | 190 | 418 | 542 | 570 | 709 | 2882 |
| **France** | 6219 | 14906 | 114 | 198 | 10493 | 1064 | 1695 | 1774 | 36463 | 313 | 750 | 6 | 10 | 528 | 97 | 96 | 107 | 1907 |
| **Germany** | 29 | 32 | 29 | 802 | 666 | 7647 | 9507 | 15084 | 33796 | 1 | 1 | 1 | 66 | 29 | 189 | - | - | 287 |
| **United Kingdom** | 7751 | 60648 | 104566 | 121741 | 130511 | 152999 | 145403 | 127000 | 850619 | 36 | 131 | 9630 | 11278 | 5588 | 20816 | 16137 | 21000 | 84616 |
| **United States** | 848 | 1734 | 9525 | 17873 | 43978 | 85123 | 112604 | 129670 | 401355 | 53 | 118 | 757 | 947 | 3144 | 2188 | 1731 | 1731 | 10669 |
| **Netherlands** | 5 | 133 | 365 | 1050 | 1825 | 2253 | 2808 | 3110 | 11549 | 0 | 0 | 0 | 0 | 230 | 265 | 285 | 300 | 1080 |
| **Norway** | 18 | 65 | 224 | 498 | 846 | 1418 | 1809 | 2072 | 6950 | 0 | 0 | 3 | 8 | 12 | 41 | 110 | 111 | 285 |
| **Spain** | 0 | 0 | 0 | 2052 | 427 | 1681 | 1430 | 1543 | 7133 | 0 | 0 | 0 | 103 | 22 | 86 | 79 | 65 | 355 |
| **Sweden** | 0 | 126 | 278 | 520 | 1253 | 1763 | 3263 | 3803 | 11006 | 0 | 6 | 14 | 26 | 40 | 57 | 76 | 74 | 293 |
| **Switzerland** | 21 | 6 | 26 | 21 | 1084 | 1995 | 3362 | 3506 | 10021 | 0 | 0 | 1 | 0 | 29 | 55 | 109 | 135 | 329 |
| **Total** | 15391 | 80486 | 120406 | 156942 | 211313 | 282107 | 308538 | 316064 | 1491247 | 429 | 1155 | 10690 | 12628 | 10040 | 24336 | 19193 | 24232 | 102703 |

| Islands | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mauritius | | | | | | | | | Seychelles | | | | | | | | |
| **Year** | **1960** | **1970** | **1980** | **1990** | **2000** | **2010** | **2013** | **2017** | **Sum** | **1960** | **1970** | **1980** | **1990** | **2000** | **2010** | **2013** | **2017** | **Sum** |
| **Canada** | 85 | 491 | 914 | 4030 | 6530 | 11240 | 11310 | 34000 | 68600 | 25 | 143 | 266 | 219 | 1006 | 1030 | 1025 | 3178 | 6892 |
| **France** | 1339 | 3210 | 16691 | 26638 | 2260 | 39958 | 44670 | 2983 | 137749 | 80 | 192 | 1 | 3 | 135 | 436 | 616 | 1365 | 2828 |
| **Germany** | 221 | 250 | 218 | 192 | 5304 | 1316 | 2747 | 15300 | 25548 | 4 | 5 | 4 | 99 | 97 | 327 | 464 | 1052 | 2052 |
| **United Kingdom** | 154 | 561 | 21561 | 24760 | 23919 | 41632 | 48044 | 45011 | 205642 | 9 | 34 | 2190 | 3106 | 1434 | 3848 | 2221 | 616 | 13458 |
| **United States** | 80 | 180 | 937 | 1656 | 4795 | 1916 | 2983 | 3561 | 16108 | 43 | 97 | 646 | 748 | 2572 | 841 | 1365 | 1657 | 7969 |
| **Netherlands** | 1 | 0 | 0 | 0 | 284 | 330 | 363 | 360 | 1338 | 0 | 0 | 0 | 0 | 79 | 83 | 87 | 86 | 335 |
| **Norway** | 0 | 0 | 0 | 442 | 115 | 451 | 375 | 243 | 1626 | 0 | 0 | 0 | 26 | 20 | 79 | 65 | 40 | 230 |
| **Spain** | 0 | 0 | 0 | 442 | 115 | 451 | 375 | 243 | 1626 | 0 | 0 | 0 | 26 | 20 | 79 | 65 | 40 | 230 |
| **Sweden** | 0 | 27 | 60 | 112 | 132 | 175 | 180 | 189 | 875 | 0 | 2 | 4 | 7 | 46 | 64 | 65 | 67 | 255 |
| **Switzerland** | 157 | 43 | 204 | 159 | 901 | 2215 | 2873 | 2825 | 9377 | 3 | 0 | 4 | 3 | 93 | 220 | 233 | 244 | 800 |
| **Total** | 2037 | 4762 | 40585 | 58431 | 44355 | 99684 | 113920 | 104715 | 468489 | 164 | 473 | 3115 | 4237 | 5502 | 7007 | 6206 | 8345 | 35049 |

Source: Derived by author from World Bank, 2018. Bilateral Estimates of Migrant Stock (1960 – 1980, 1990, 2000, 2013, 2017).

Note: *zero means no migration, dash means missing values.*

Figures 4.1 and 4.2 together represent migration from the complete set of origin to destination countries considered; they have been reported separately for clarity of exposition. Observable from both maps, outmigration has been concentrated in the five core destinations, OECD-5. Morocco, in spite of the large proportion at 62 per cent of emigration directed to OECD-5, still stands out as relatively more emigration diverse to OECD-N destinations than all the other origin economies (Africa-10). The other countries all have at least 90 per cent of their emigration volumes concentrated in OECD-5. The smaller countries also tend to be less emigration diverse. Indeed, 82 per cent of all migration from Malawi is directed towards the United Kingdom.

Figure 4.1 focusses on OECD-10 destinations in Europe; it describes intensity of in-migration for which France at 4,497,163 has the overall highest migrants from Africa-10 among the OECD-10 destinations. France represents an important destination for all African countries; in the case of Morocco, almost half of all its emigrants leave for France (49%). Three other countries, namely Mauritius (26%), Nigeria (20%), and Ghana (20%) each has at least twenty per cent of their migration directed towards France. Egypt (9%) and Seychelles (8%) have values which are close to 10 per cent. However, France only has a small proportion of migrants from South Africa (3%), Kenya (3%), Malawi (2%) and Botswana (2%).

Expectedly, the United Kingdom (2,613,792) and the United States (2,241,429) follow, but, surprisingly, Spain also falls under this next category. Spain only became a net receiving destination in the 1990s, yet the number of migrants is within the second highest category at 2,206,948. These patterns point to the importance of interaction between key determinants of migration such as labour market attraction, networks, and distance. Next in magnitude of migrants is Canada (1,073,136), followed by the Netherlands (836,549) and Germany (777,704); and, in the final category, are the remaining three emerging destinations Switzerland (121,212), Sweden (65,755), and Norway (43,363). The values for emerging destinations such as Spain and the Netherlands are driven by emigration from Morocco.

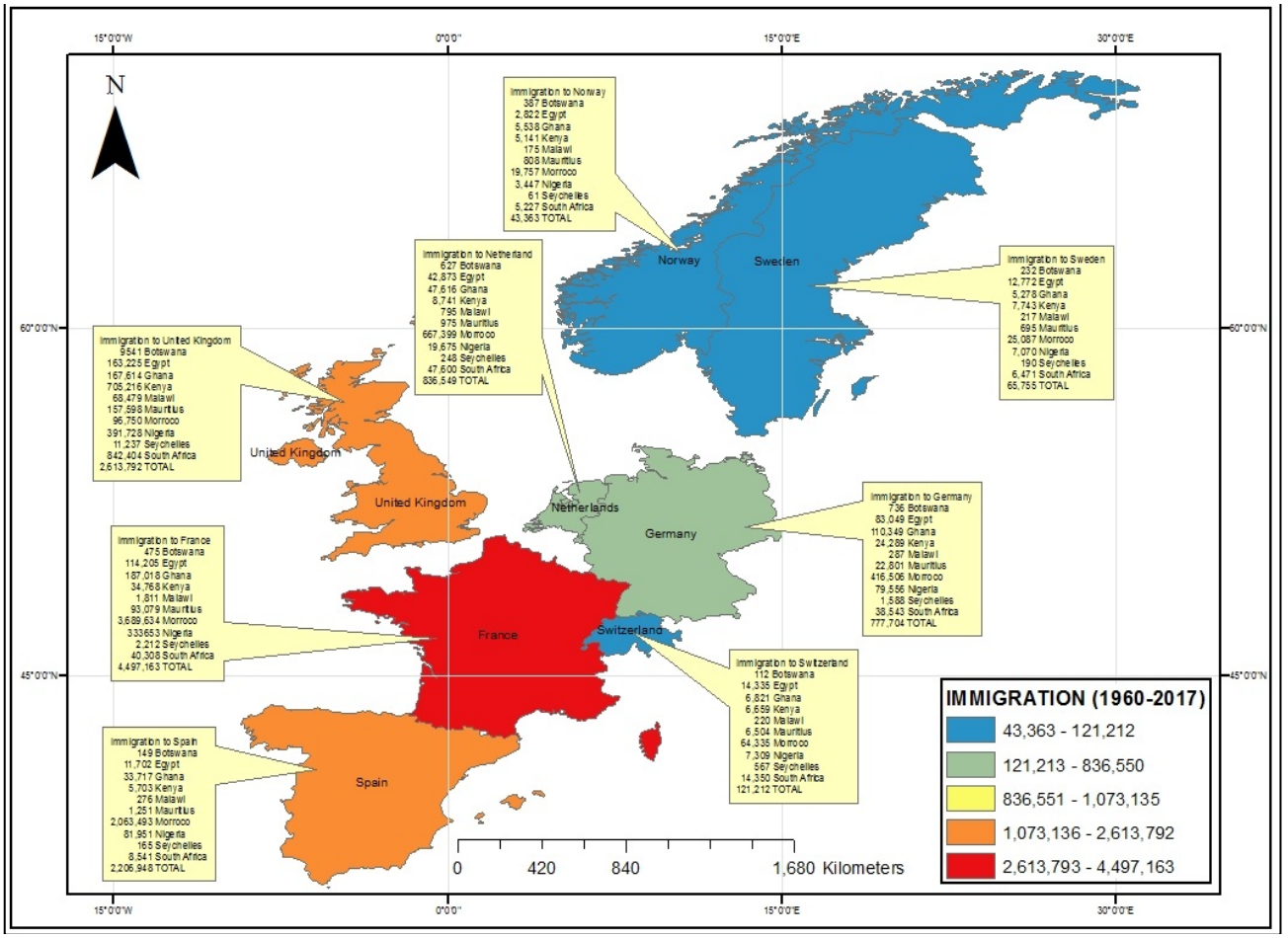



**Figure 4.1: Intensity of Migration from Africa-10 to selected destination in OECD-10, 1960 to 2017**

Source: Computed by author from World Bank, 2018. Bilateral Estimates of Migrant Stock (1960 – 1980, 1990, 2000, 2013, 2017)

Figure 4.2 shows emigration out of Africa-10 to Canada and the United States. The larger source countries, in geographical size and income, have higher migration to these two relatively farther destinations. In the case of migration to the United States, the first six source economies are Egypt (604,505), Nigeria (487,604), South Africa (326,792), Kenya (288,751), Ghana (249,737) and Morocco (248,931). There is no observable regional consistency in emigration to Canada and the United States. Nigeria is the highest source of emigrants from Africa-10 to Canada and the United States each. Most of the top source countries are common to both destinations in Northern America; indeed, the only difference is that more migration from Morocco is towards Canada, predictably given common French language ties. This language pattern is naturally missing in Egypt from where more migrants go to the US than to Canada.

Observing migration to Canada, the highest five sending economies are Nigeria (240,529), South Africa (174,395), Morocco (161,527), Ghana (139,181) and Kenya (95,698). The source countries in the bottom rung of migration to the United States, are Mauritius (13,125), Malawi (8,938), Botswana (6,442), and Seychelles (6,604). Malawi (8,938), Botswana (6,442) and Seychelles (6,604) also have significantly lower migration to Canada. These countries, with the exception of Malawi, have significantly lower income in comparison with the rest of the Africa-10 economies. In terms of geographical distance, the countries with lower migration, with the exception of Malawi, are among the farthest from both destinations.

Overall, 14,477,051 migrants moved from Africa-10 to OECD-10 between 1960 and 2017. Morocco had the highest volume of out-migration at 7,453,419 emigrants. Migration from Morocco drives up the averages for Northern Africa since the averages are not representative of the volume of emigration from Egypt. The subsequent set of countries by order of intensity of migration is Nigeria (1,652,522) and South Africa (1,504,632). These two countries (Nigeria and South Africa) are lower middle-income countries, with the financial means to afford international migration. Egypt (1,244,501), Kenya (1,182,709) and Ghana (952,869) follow. The smaller countries in geographical space and population predictably have lower migration volumes as seen in the cases of Malawi (83,510) and Mauritius (354,126); as well as the smallest category of total number of emigrants arising from Seychelles (28,739) and Botswana (20,025).

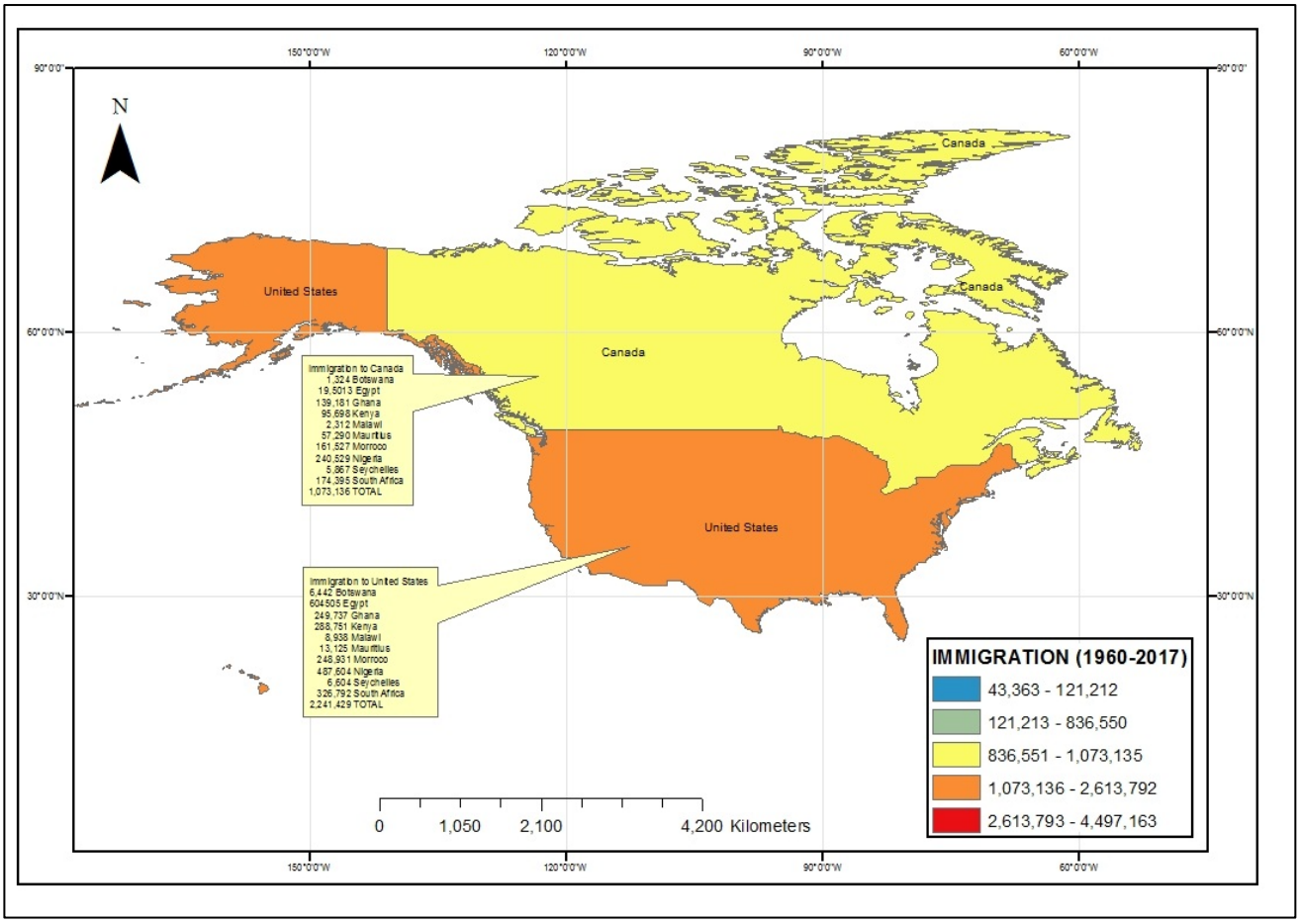



**Figure 4.2: Intensity of migration from "Africa-10" to the United States and Canada, 1960 to 2017**

Source: Computed by author from World Bank, 2018. Bilateral Estimates of Migrant Stock (1960 – 1980, 1990, 2000, 2013, 2017).

Figure 4.3 concentrates on outmigration from Africa-10, and as in the case of all the maps, the intensity is colour coded and the country sizes are to scale. The highest volume of emigration comes from Morocco with a value of 7,453,419 dominating the volume of migrant stock to the OECD-10. Morocco while relatively small in geographical size has proximity to Europe to its advantage in driving up migrant stock. Indeed France, Germany, Netherlands and Spain are top destinations of migrants from Morocco.

Following Morocco, the next highest values are from Nigeria at 1,652,521 and South Africa at 1,504,631 migrants to the OECD-10; these two are among the largest in geographical size. While South Africa is larger than Nigeria in geographical size, South Africans have to travel larger distances to get to most of the OECD-10 than Nigerians. The migration volumes from Nigeria are slightly higher compared to South Africa by about nine per cent. These are followed by Egypt at 1,244,500 and Kenya at 1,182,709 again two countries that fall among the same group among the sample in terms of geographical size. Egypt is both larger and closer to Europe than Kenya, yet the difference in migration volumes are only about five per cent less for Kenya. Ghana also has close to a million migrants in OECD-10, with the exact values standing at 952,869. Ghana is smaller than Kenya in geographical size but closer in proximity overall to the OECD-10.

Next in volume of migrant stock is Mauritius at 354,126 followed not so closely by Malawi at 83,510. While the proximity to the OECD-10 of these two countries is comparable, Mauritius is significantly smaller in geographical size than Malawi. This suggests that factors peculiar to Mauritius such as seasonal changes affecting Islands could be among those contributing to the relatively higher migrant stock from Mauritius. The lowest volumes of outmigration come from Botswana (20,025) and Seychelles (28,739); these countries are among the smallest in geographical size in the sample of African countries. In terms of distance, Seychelles is among the farthest from the OECD-10.

Predictably, the top destinations for Moroccans are France (3,689,634), and Spain (2,063,493). A critical look at the migration values vis-á-vis these destinations, including for the Netherlands (667,399) shows that a significant proportion of migration from Africa originates from Morocco. Notably, migration patterns from Morocco fit *textbook* expectations as they reflect labour market agreements, distance, and financial capabilities,

with a significant proportion of their emigrants in Europe. For instance, Germany, Netherlands, and Spain have had labour market agreements to source for workers from Morocco during the period of analysis. Emigration from Egypt reflects significantly different patterns from its Northern African counterpart. The bulk of its emigrants are in the United States (604,505) and United Kingdom (163,225). Migration from Africa, to the Netherlands, and Spain shows important differences in magnitude from the other three emerging destinations in the Scandinavian region. This is expected since the selected countries within the African region are diverse in economic and population size, as well as distance from the OECD-10.

Visibly, from the colour codes, Africa-10 migration patterns are not consistent regionally, and differ substantially, for instance, between the two selected Islands. The volume of migration from Seychelles is less than ten per cent that of Mauritius. Migrants from both Islands mostly go to the United Kingdom, while France, Canada, and Germany are important destinations for migrants from Mauritius; whereas in the case of Seychelles migrants are concentrated in the United States and Canada. In a similar vein, migration from Malawi is less than ten per cent that of Kenya, and while migrants from both origins concentrate in the United Kingdom, United States, and Canada, the volume again, differs significantly. The greatest regional difference in volume of migration is for Southern Africa. While the United Kingdom is an important destination for Botswana and South Africa, the volume of migration from Botswana is just above one per cent of the values for South Africa. These reflect differences in size, distance, population and financial capabilities to move between the two countries in the same region.

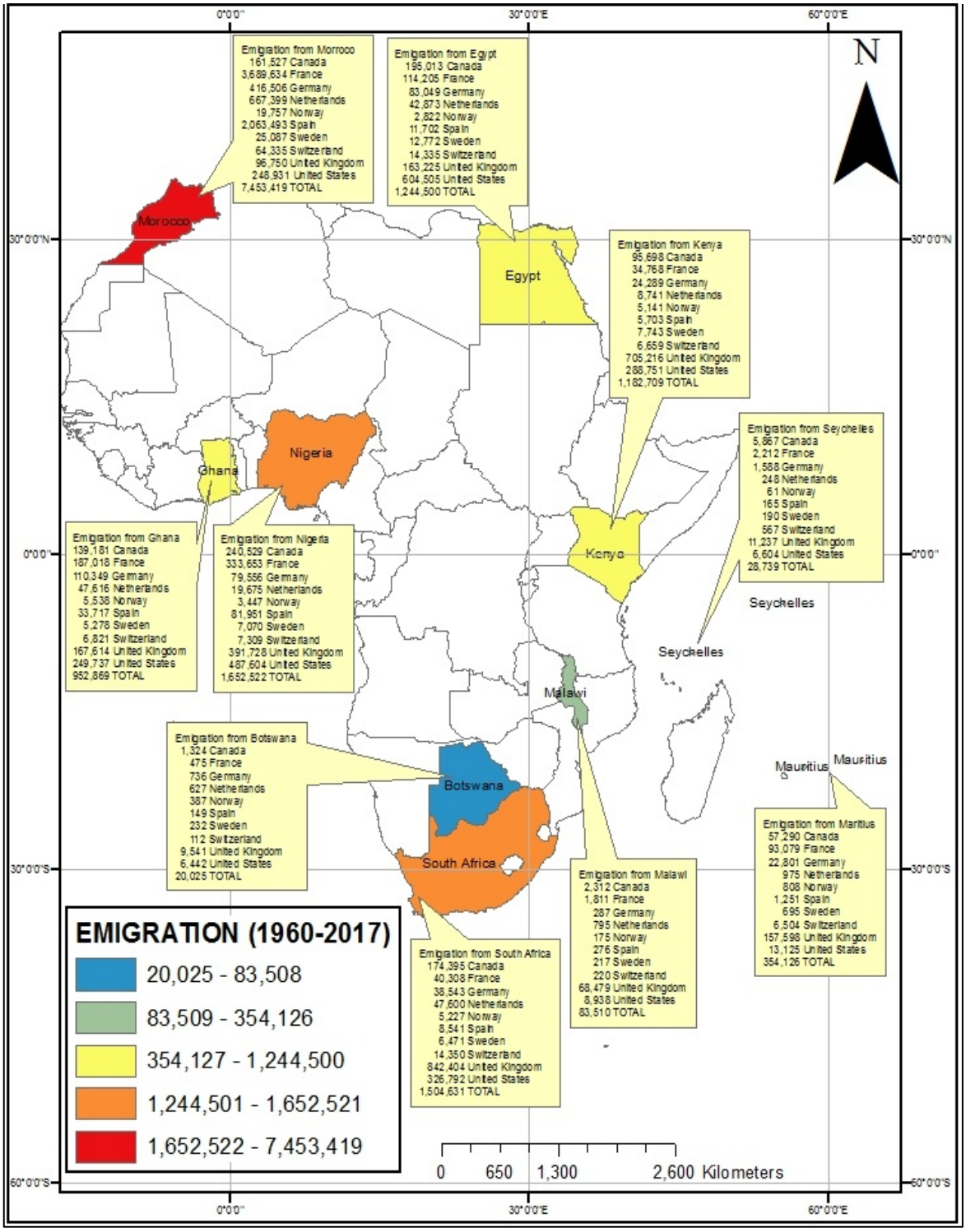



**Figure 4.3: Emigration from Africa-10 to OCED-10, 1960 to 2017**

Source: Computed by author from World Bank, 2018. Bilateral Estimates of Migrant Stock (1960 – 1980, 1990, 2000, 2013, 2017)

The array of ten graphs in Figure 4.4 show significant similarities as well as variation over time in terms of outmigration from Africa-10 by country of destination. Generally, emerging destinations show steady upward sloping migration with disruptions in migration patterns common in the 2010s. Exceptionally, African migrant distribution to Spain, from all sources was erratic, and especially so for Eastern Africa and the Islands. While immigration to Switzerland has been rising with time overall, emigration from Morocco [to Switzerland] was unstable until the 2010s when it started to rise steadily.

A decline in migrant stock in Spain set in around 2010 for Mauritius and Seychelles, and the same applied, although less significant in volume for Nigeria, Kenya, Malawi, and South Africa. This fluctuation suggests that while networks play a significant role, they do so in conjunction with other factors, including market forces and restrictions on mobility. Nigeria showed more stable growth in migration than Ghana to three core destinations (Germany, United Kingdom and United States). In the case of Kenya, migration to Germany rose steadily, particularly post 2010.

Once an initial connection is made, migrant stock associated with networks, through indicators such as language, and historical or colonial links, tended to be scaled up by existing compatriots who helped reduce migration costs for fellow nationals by sharing information and resources, including collaborating to finance migration, and sharing housing. Yet, migration fluctuations between Morocco and France does not particularly reflect that they are driven primarily by existing historical ties; conversely for Ghana and Nigeria it is reflective of colonial and language ties, but that changed around 2010. Migration from Africa to the OECD-5 shows more variations than to the OECD-N, particularly for former colonies such as United Kingdom and France; this trend questions the dominance of networks in explaining migrant distributions.

The stable growth patterns of migration from Africa to the OECD-10 suggest that destination country effects emerge despite source country situations. The example of migration from Africa to Canada, which shows stable growth over time, alludes to specific pull factors in Canada cause the persistent increase in migrant stock there rather than overall trends in conditions within Africa. However, the trends also reflect late starters for example, there is a spike in migration from most Africa-10 countries to Canada after 1980, however,

for Nigeria, the rise occurred much later in the 1990s coinciding with worsening economic conditions there and spiked further after 2010. Indeed, many countries, apart from Nigeria especially Ghana, Mauritius and Seychelles show spikes in their migrant stock in Canada after 2010, which is likely associated with programmes and policies encouraging migration to Canada. Eastern Africans have been moving increasingly to Canada, and the OECD-N.

Migrant stock of Africa-10 in Canada and France showed similarities in patterns of growth, these reflective patterns are further observable in each region as migration tended to rise and fall in North, South, East and West Africa in roughly the same patterns for these destinations. For instance, the brisk decline in migrant stock from both Morocco and Egypt to France in the 1990s was followed by the rise in 2000. Similarly, a flattening of migrant stock from Botswana and South Africa to France is observable in the 1980s. Again, for Ghana and Nigeria, the changes in volumes of migrant stock in France until 2010 were so marginal that the graph is almost flat.

Only the Islands showed strong variations in the migrant stock to France among the two selected Islands, with migration from Mauritius to France being more volatile. While the same source region shows consistent migration patterns to Canada, the migrant stock and periods fluctuate significantly for France. The differences in migrants' destination choices despite similar source country conditions suggest that part of the migration patterns could have been driven by receiving country differences.

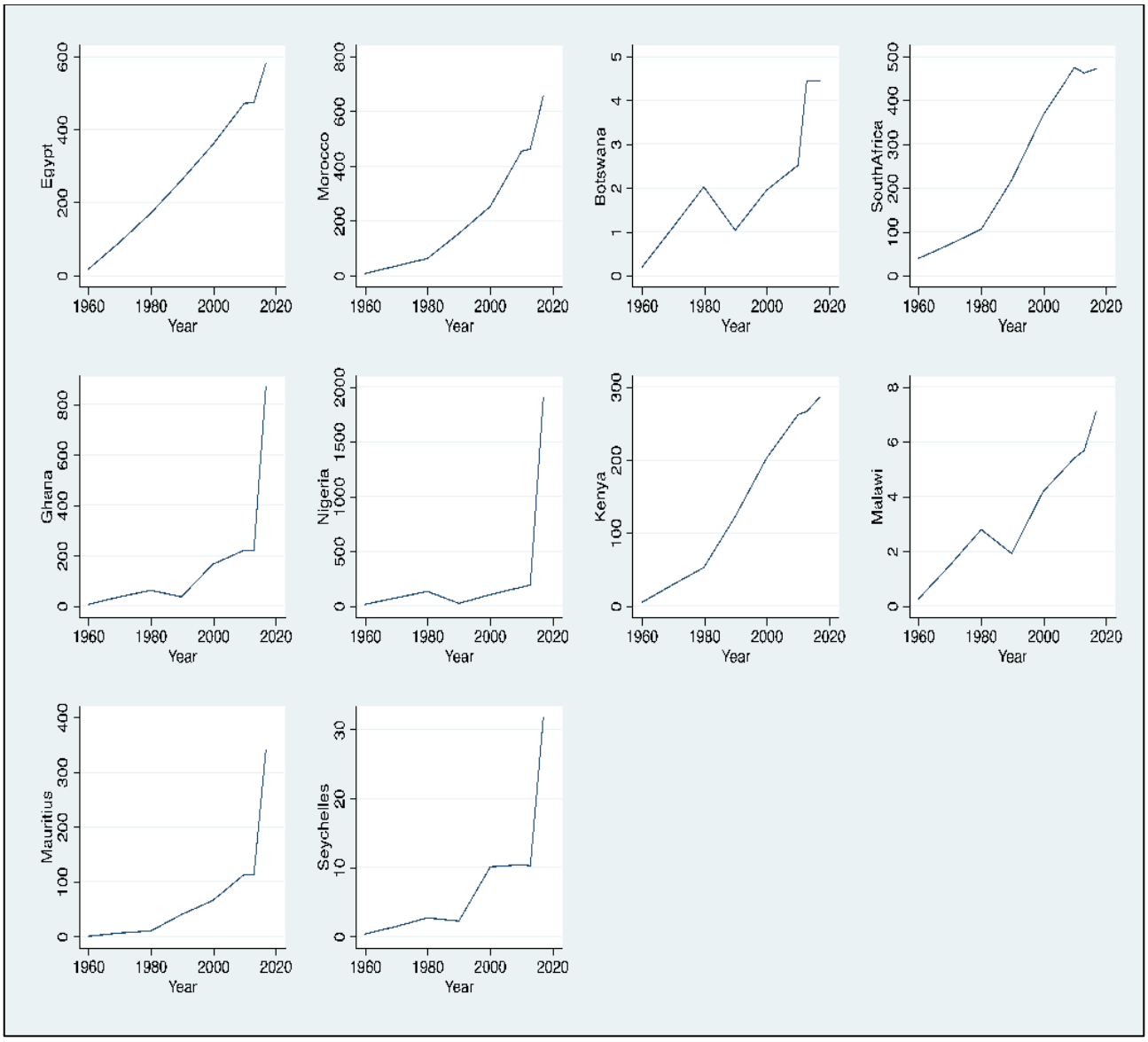
There are two OECD-5 destinations for which migration from Africa showed shifts in the 1990s, these are France and United Kingdom. A part of these capture latent effects of breaks from the Commonwealth of Nations and similar changes to mobility between African countries and their former colonies. In the case of France, migration from Northern Africa to the OECD increased over time between 1960 and 2017, while there were significant falls in migration from Northern Africa to France in the 1990s, that did not show in other core destinations.

Congruently, migration from Africa-10 countries to France had been erratic, except from the Western African countries, which had a late start in 2010 but steady growth afterwards. Notably, migration patterns to France are similar for countries within the same (north, south, east, west) region, except for the islands: Seychelles and Mauritius. A rapid decline in 2010

is seen in France but this time in migrant stock from Botswana, South Africa, Kenya, Malawi, and Mauritius.

In the case of the United Kingdom, migration from Ghana declined briskly in the 1990s in contrast with Nigeria that showed a steady growth until 2010 when both countries witnessed a sharp fall in stock of migrants. This partly reflects different responses by the two former British colonies to restrictions imposed by former colonies in the 1980s. Generally, migration from Africa-10 to the UK increased until 1990, except in the case of Botswana where increase in migration only started in the 1990s. Migration to the UK also declined rapidly after 2010 for Ghana, Nigeria, and Seychelles. In the year 2010, migration from Kenya to the United Kingdom and France declined, indicating migrant responses to peculiarities at these destinations, which could be related to changes in migration policy at these locations. Half of the Africa-10 showed similar changes in migration to France and the United Kingdom in the 2010s.

## 1. Canada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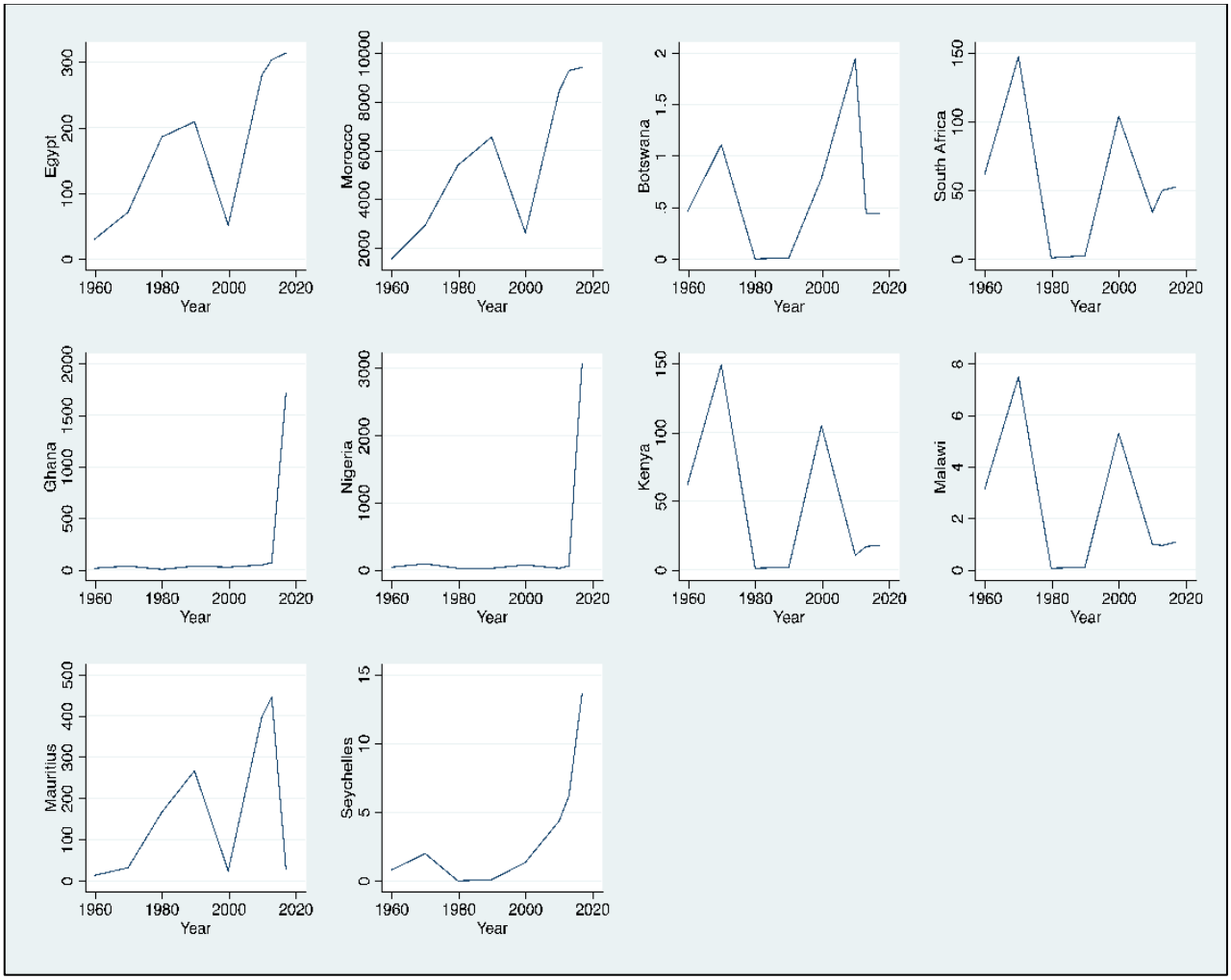
## 2. France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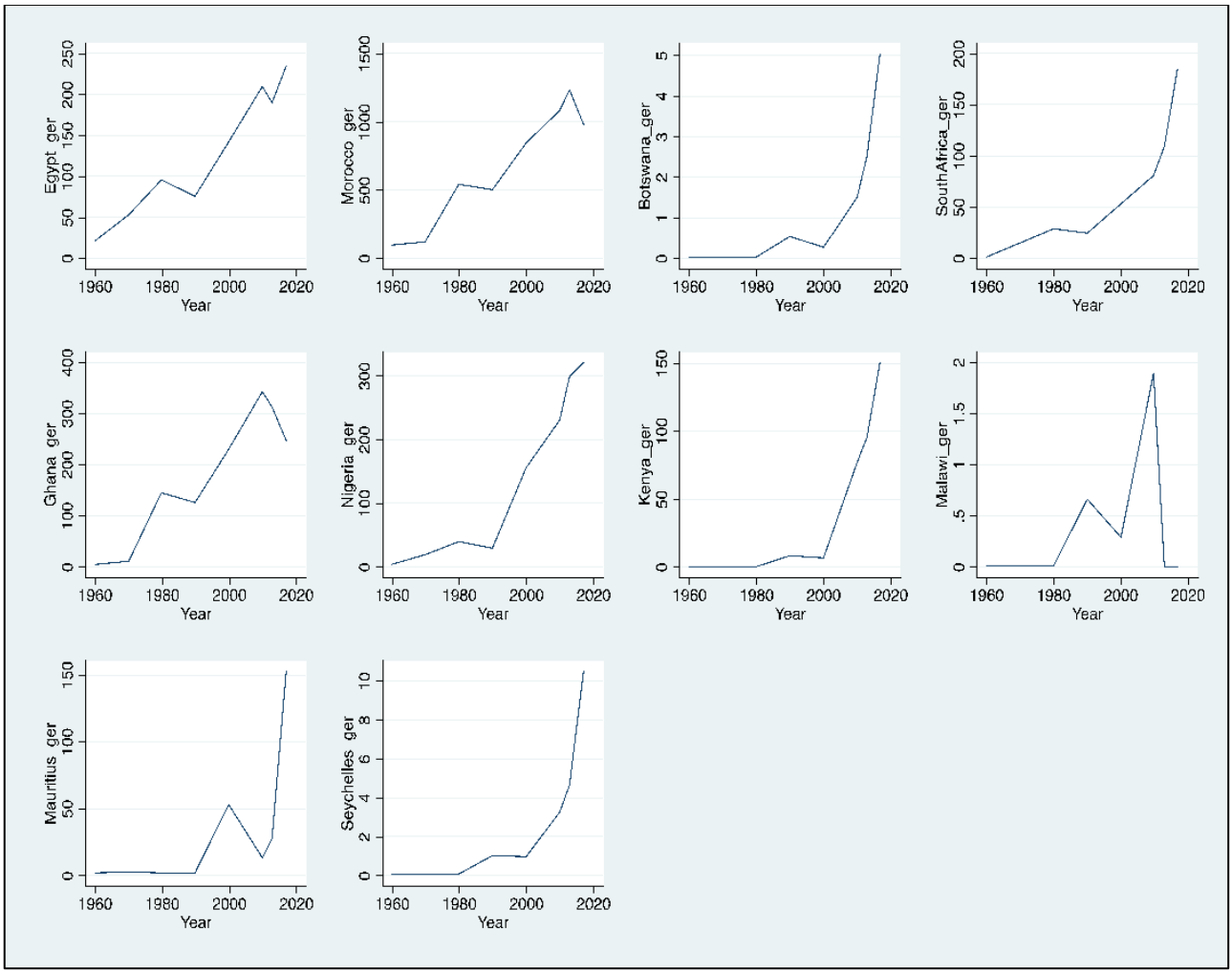
## 3. Germany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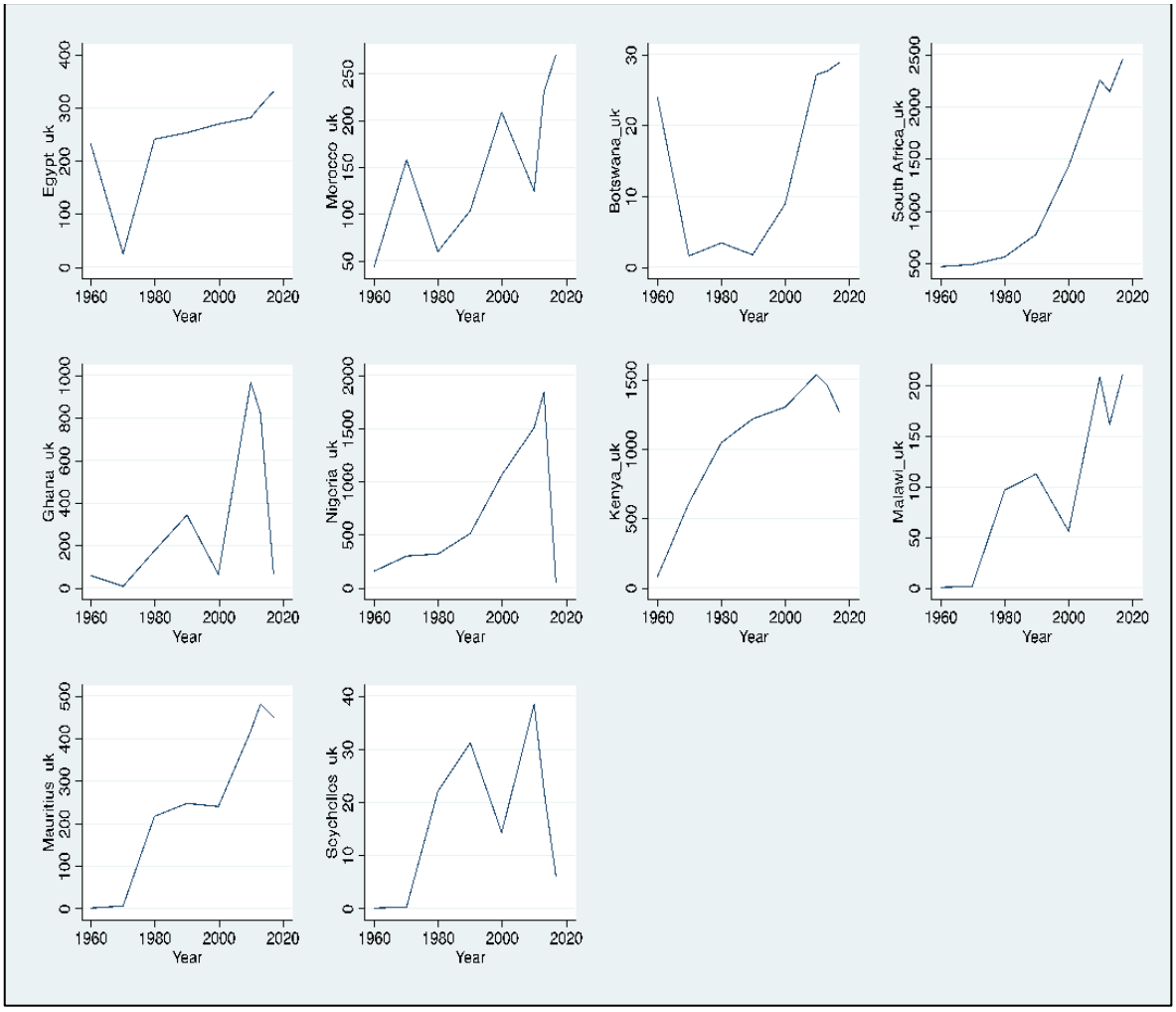
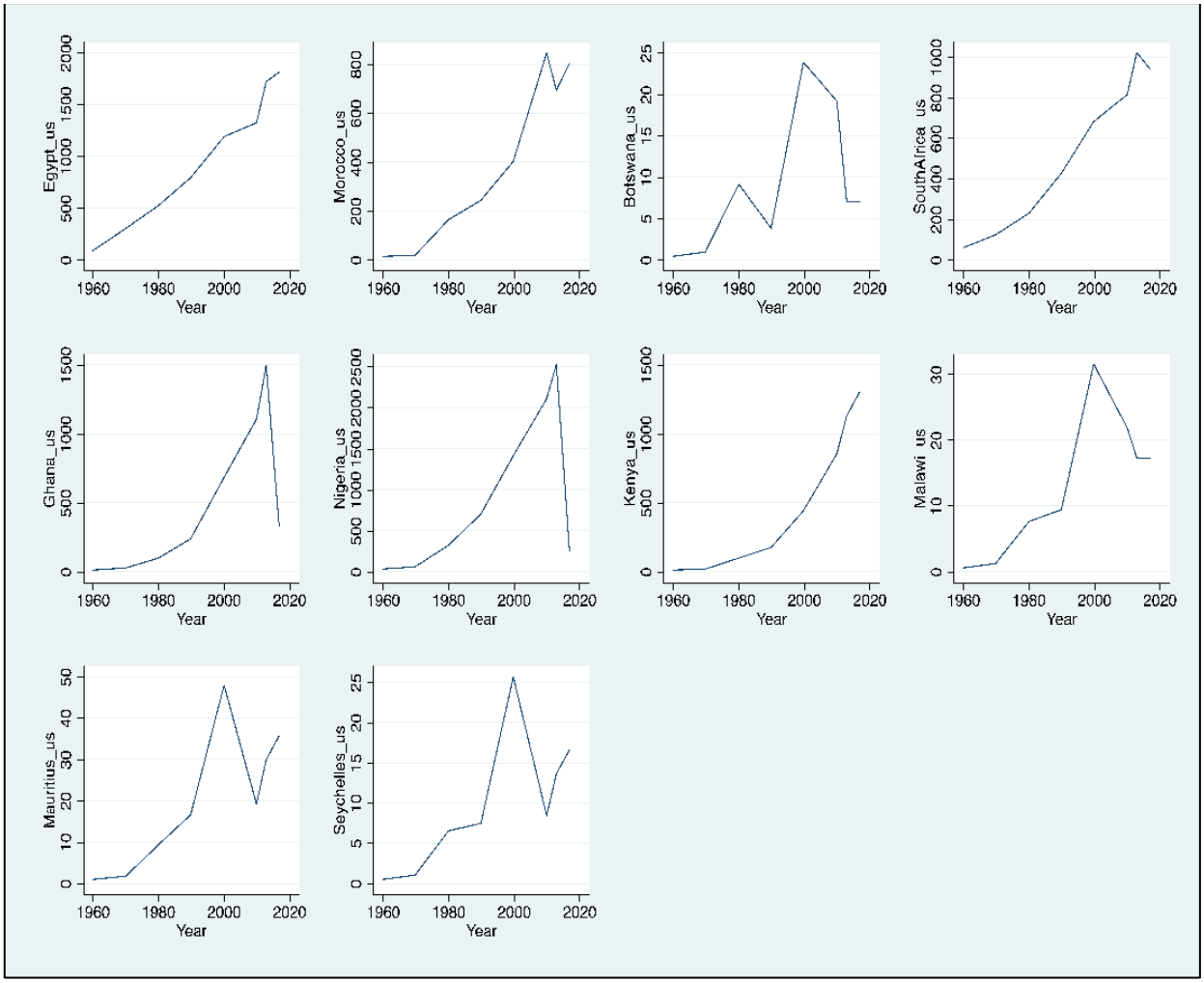
## 4. United Kingdom



## 5. United States



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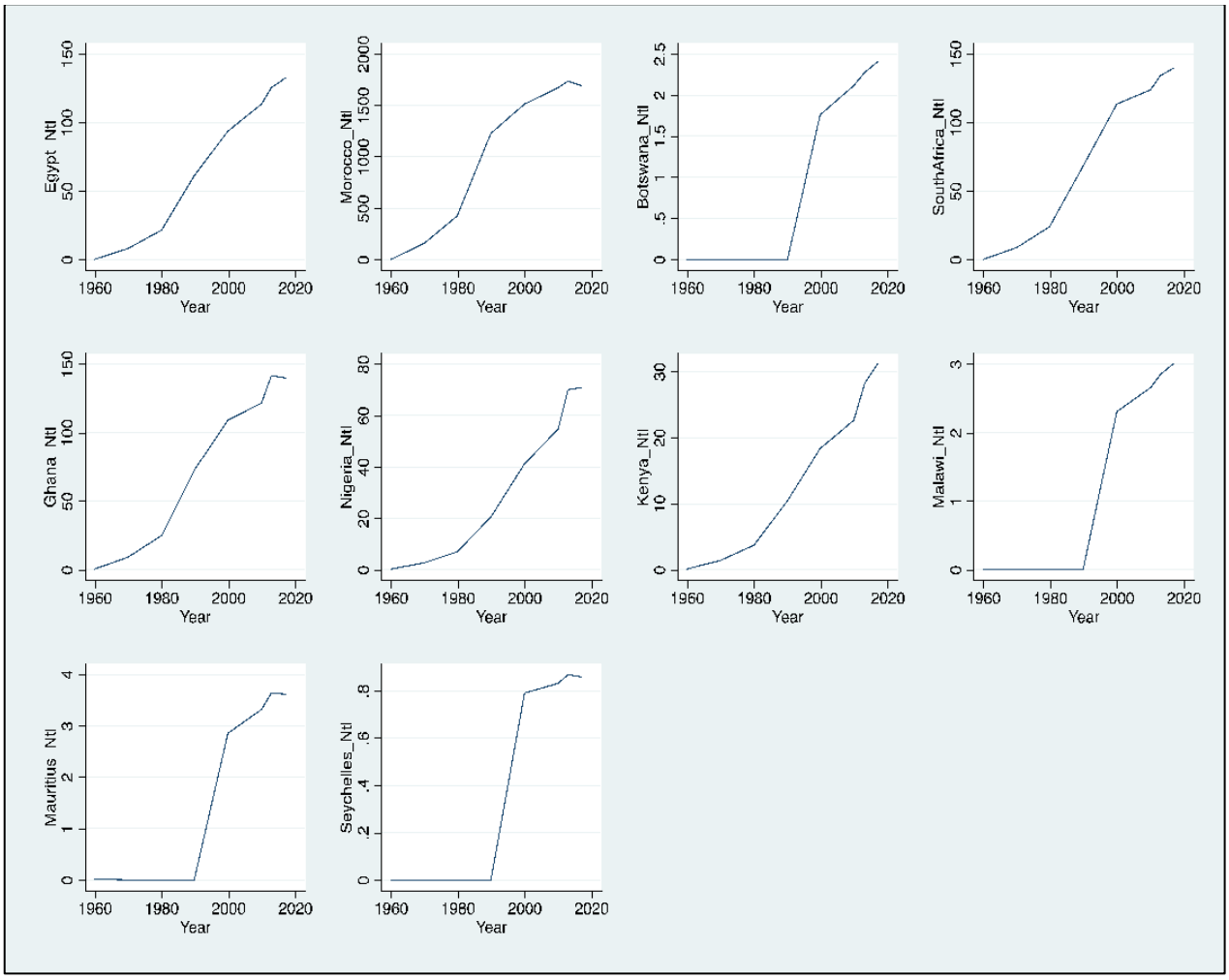

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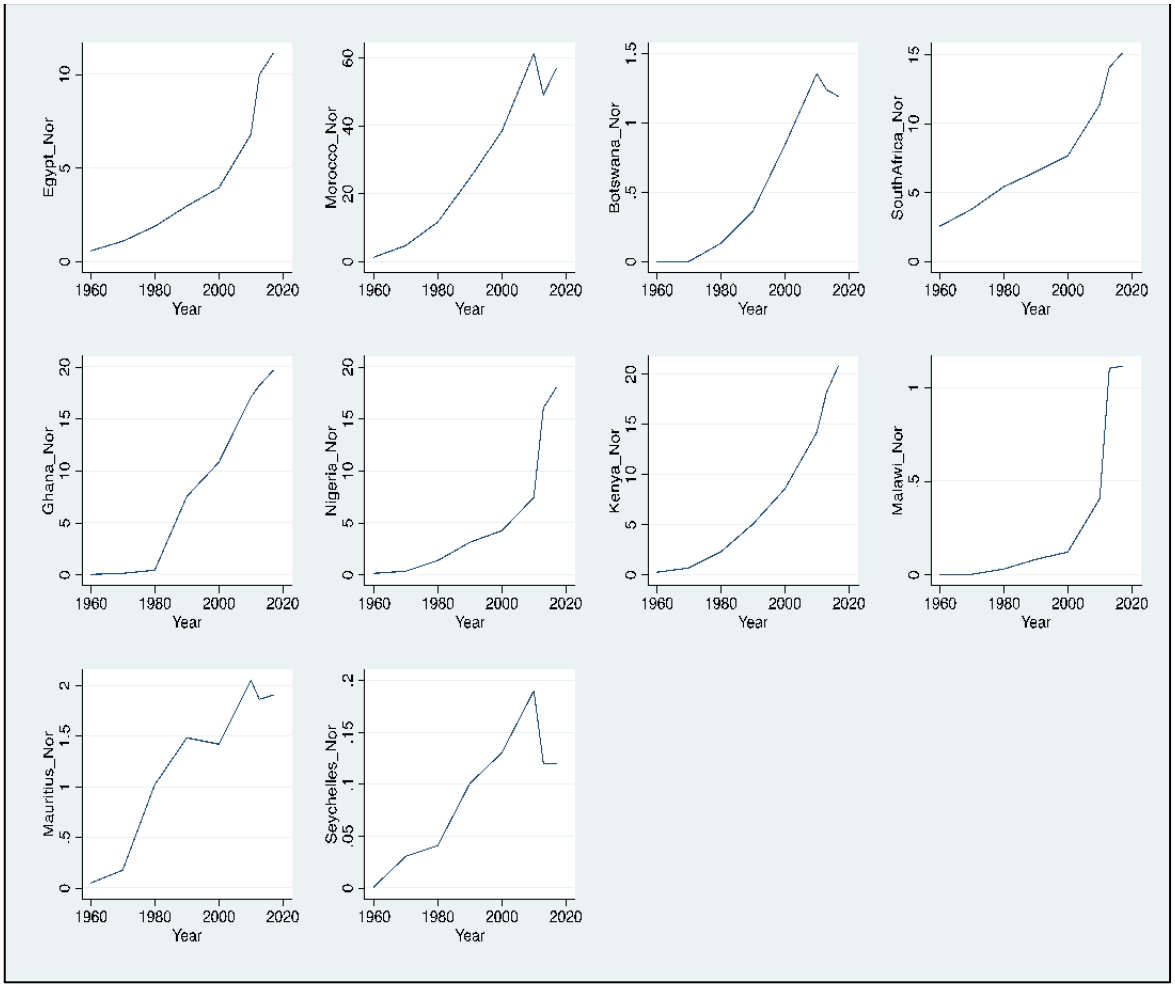
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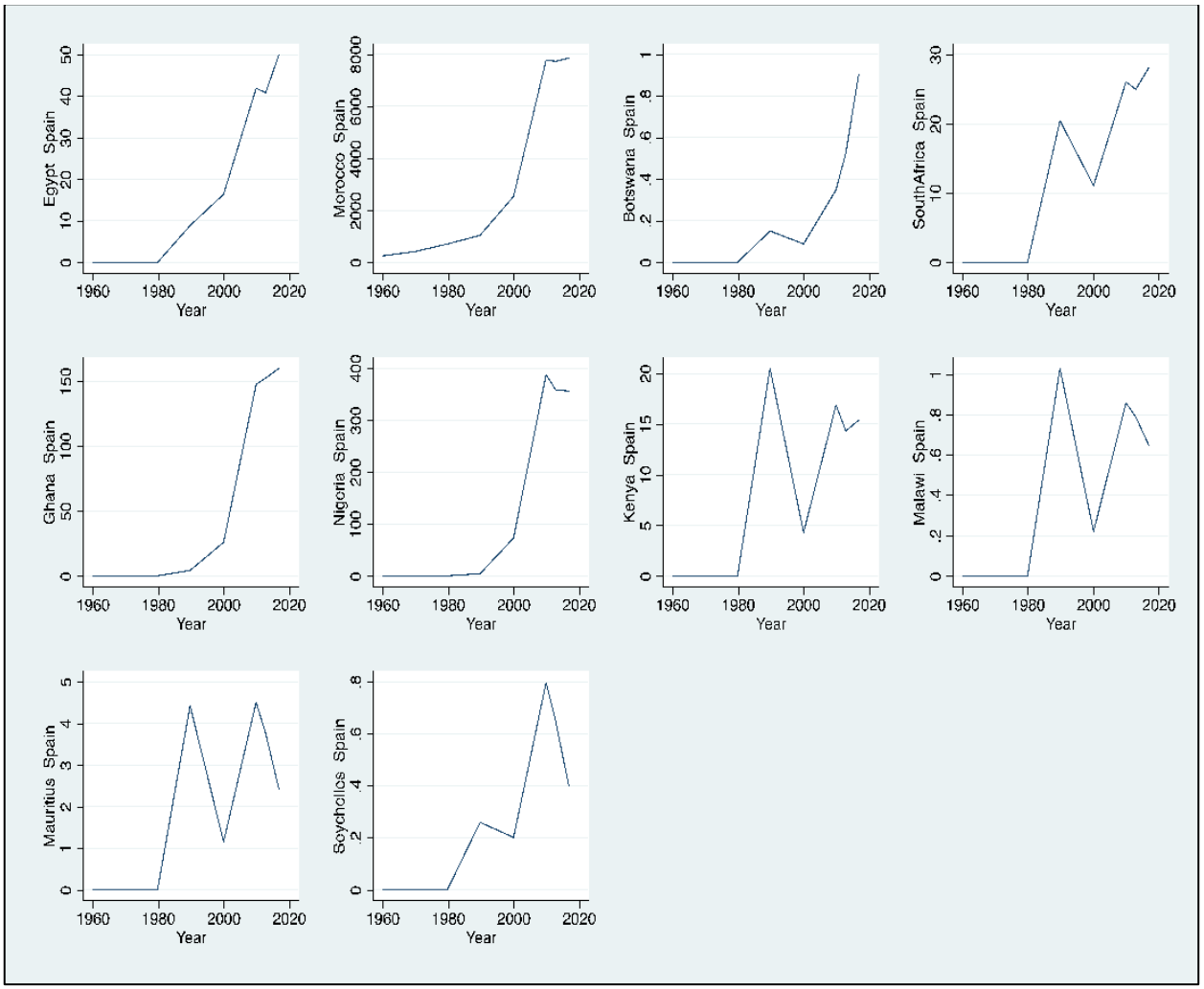
## 8. Spain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SouthAfrica Spain
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Ghana Spain
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Nigeria Spain
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Kenya Spain
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Malawi Spain
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Mauritius Spain
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Seychelles Spain
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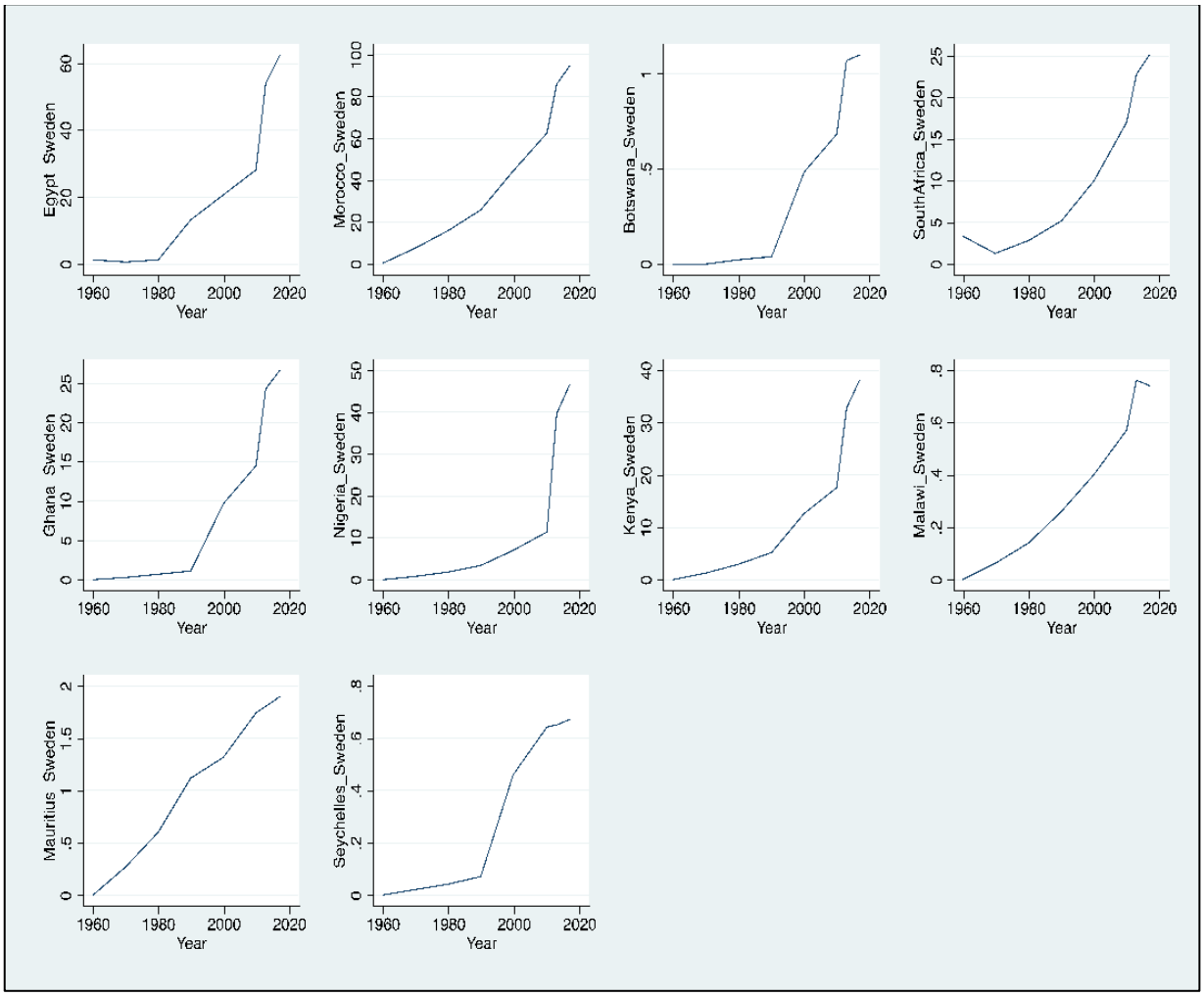
Year

## 9. Sweden


Egypt_Sweden
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## 10. Switzerland

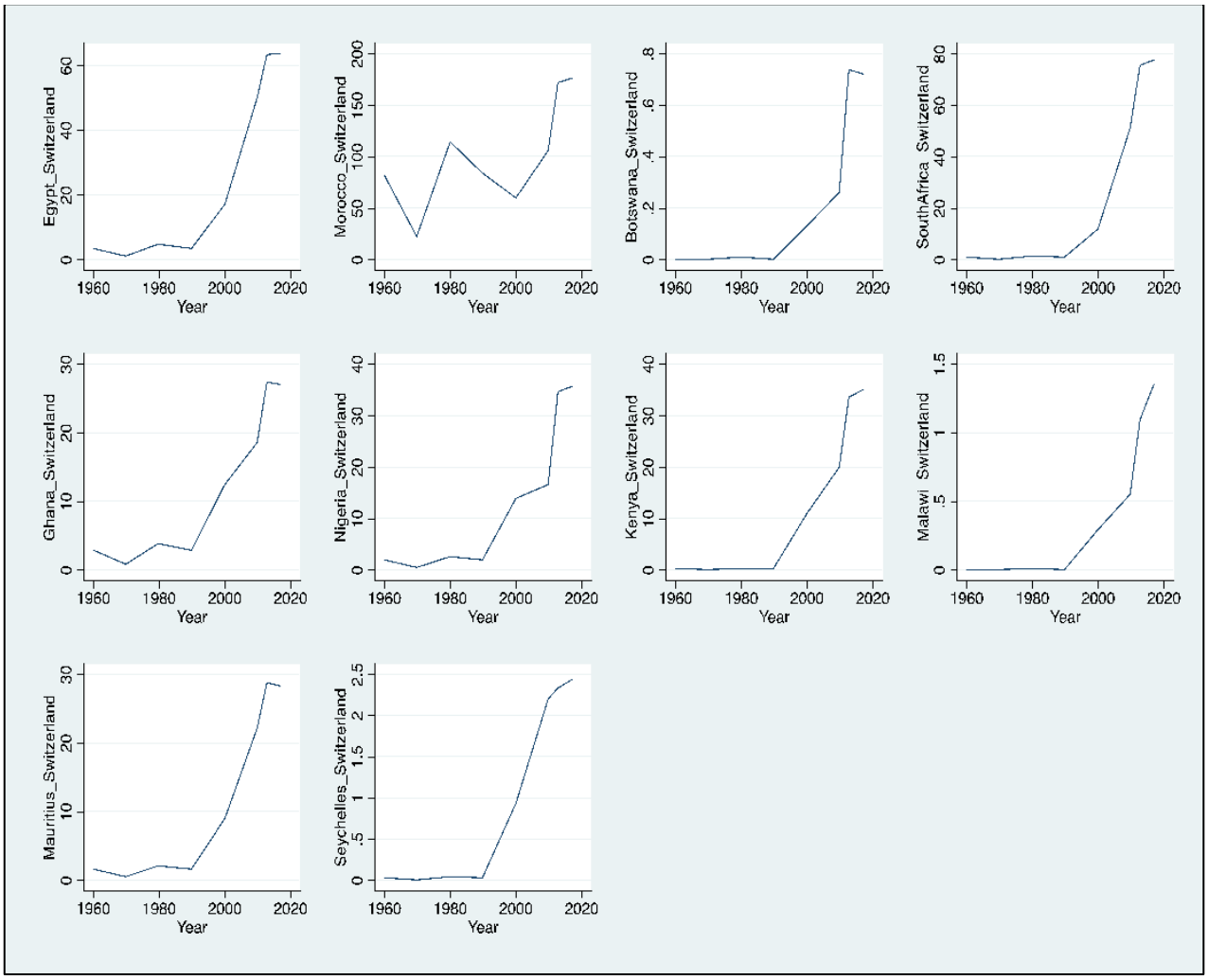


**Figure 4.4: Migration from Africa to selected global north destinations ('00 of migrants), 1960 to 2017**

Source: Computed by Author from Computed by author from World Bank, 2018. Bilateral Estimates of Migrant Stock

### Destination country economic conditions and African migration[28]

High income countries host two-thirds of all migrants (UNSD,2013). In 2017, the share of migrants in high income countries rose, while it declined for middle and low-income countries (UNECA, 2017). Wages at destination country are a significant determinant of migration, but the net impact varies with other country specific characteristics, such as distance from country of origin, level of openness to migration, and individual characteristics such as language, cultural and historical connections.

Figure 4.5 shows wages in upward movement at all destinations, over the period of analysis, except the United Kingdom where they have started to decline in the last decade. It is observable, that the common African migrant destinations are not always those with the highest wages, as the values of some OECD-5 and OECD-N move closely together. A case is Switzerland with relatively favourable markets conditions; however, migration flows to Switzerland are smaller than to the OECD-5. Netherlands and Switzerland have better wages than other destinations with higher migration flows from Africa such as Canada, France, Germany, and the United Kingdom.

Generally, employment improved marginally in the OECD, with some exceptions such as the US where the values declined. Real minimum wages as well as average wages improved in the OECD except for Greece, which suggests that wages are higher in more popular destinations. Manufacturing prices range marginally, although they are mostly lower within popular destinations (OECD stat, 2017).

[28] For a presentation of the values please see appendix 4

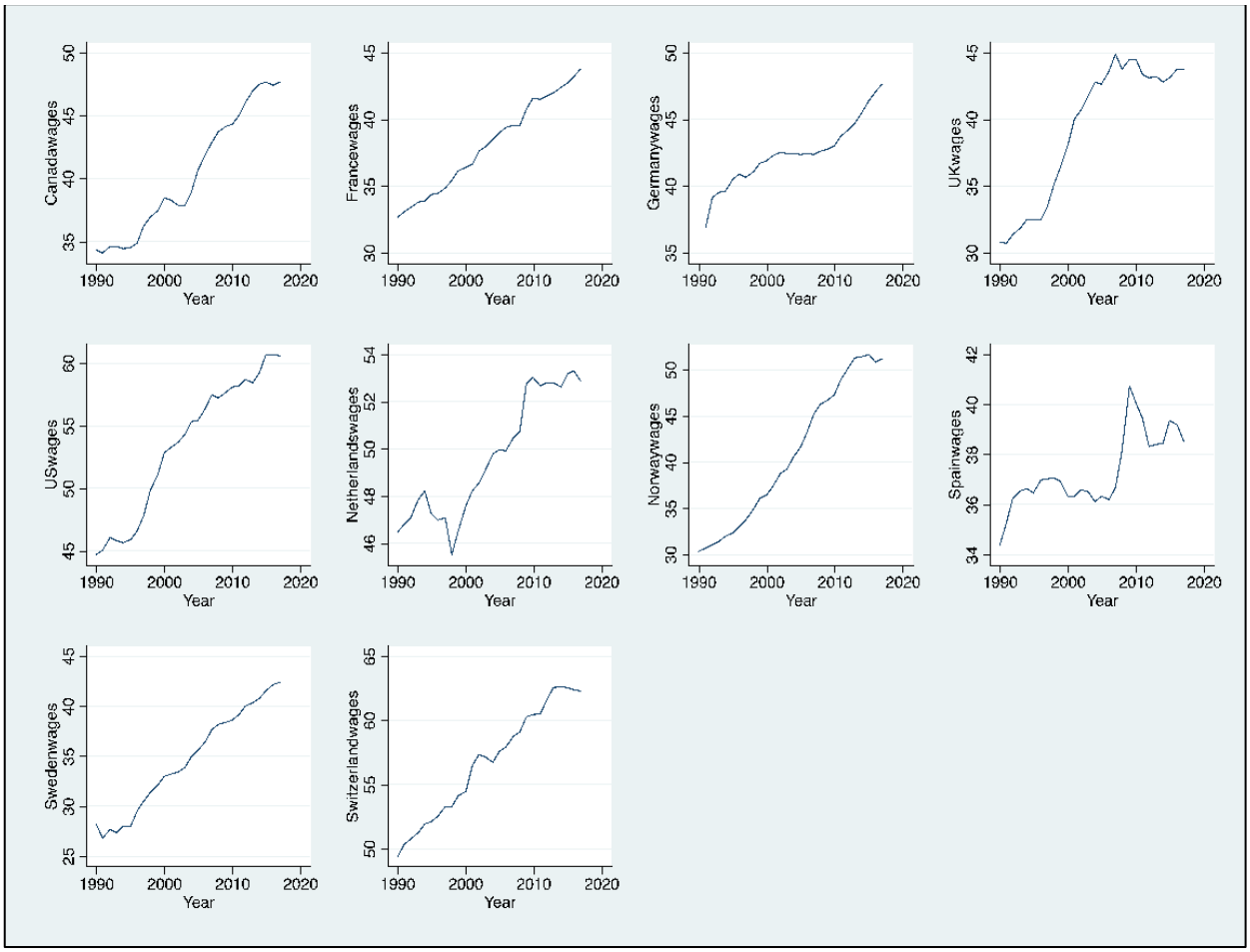


**Figure 4.5: Average annual nominal wages in OECD-10, current USD, thousands, 1990 to 2017**

*Source: Computed by author from OECD-stats database, 2017.*

Figure 4.6 shows how employment by sector has changed over the period. Employment in services has been highest and increasing while manufacturing and agricultural sectors have seen declining employment rates driven by technological improvement. Sectoral employment rates are hardly distinguishable among selected destinations, apart from Germany where employment in industry is higher than other destinations. Conversely, the service sector in Spain took much longer to rise to the rates than other destinations; indeed, the slope of the service sector employment graph became visibly steeper after 2010. Employment opportunities are location specific destination country characteristics that attract migrants who respond to favourable market conditions. These could have cumulative positive effects on prices and wages. All the common destinations, that is, OECD-5, have employment rates above the OECD and EU average.[29]

The decline in employment in industrial/manufacturing sector in favour of services is most prominent in OECD-5, especially in Germany and the United Kingdom, and the most significant change occurred after 2010. However, Spain and Sweden among the OECD-5 also showed prominent rises in service sector employment at the same time that industrial sector employment declined. All the destination countries had been industrialised over the entire period captured, so that the changes in agricultural sector employment were only marginal. In most of the OECD-5 countries for instance Canada, Germany and France the decline in agricultural sector employment was slightly visible after the year 2000. Conversely, for most of the OECD-N countries such a Netherlands, Norway and Spain this marginal decline in agricultural service employment was visible after 2010. Again, for most of the destination countries service sector employment had been rising steadily throughout the period but showed a slightly steeper slope after 2010. The industrial country employment patterns in conjunction with wages characterise markets that migrants could find attractive.

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[29] Nominal wage values are available in Appendix 4

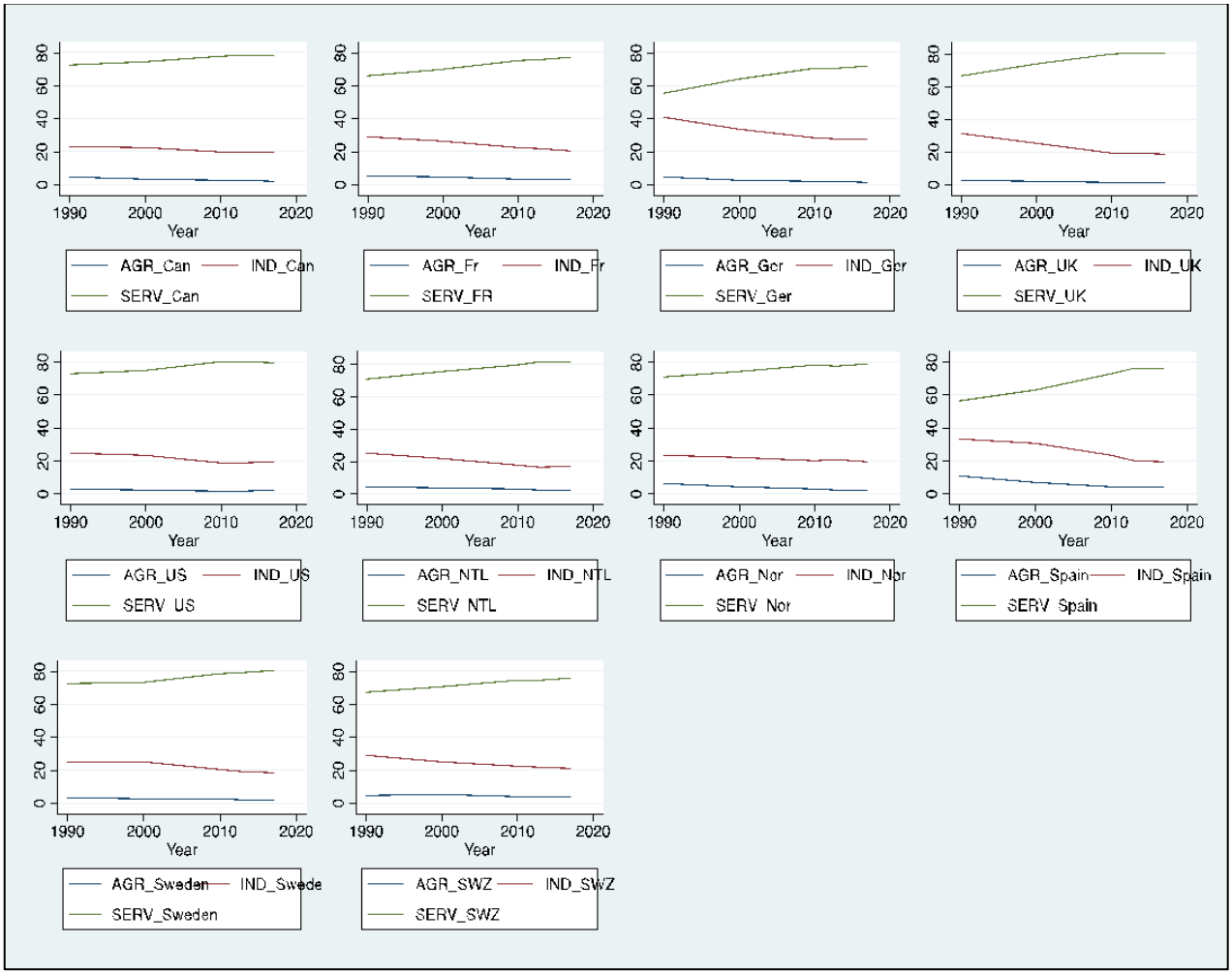



**Figure 4.6: Employment rate by sector at global north destinations, 1990 to 2017**

*Source: Computed by author from OECD-stats database, 2017*

Previous migrants interact with prospective ones forming networks that reduce migration costs. Congruently, networks have been prominent contributors to migration and consequent migrant destination choices post colonialism. Migrants may also be responding in distinct ways to market forces such as wages and employment, driving their discovery of new destinations different from those they had previous ties and networks with. Table 4.2 is presented in string form to show bilateral remittances from each global north destination to Africa. The string of tables shows higher remittances from those countries to which migration is also significant, particularly the United States and the United Kingdom. This is expected of the database, which estimates bilateral remittances according to migrant stock. It is also worthy of note that countries like Nigeria with significant migration stock likewise receive substantial remittances relative to other African countries. Bilateral remittances have been increasing steadily in most cases, from all destinations.

Although the remittance literature is divided on which migrants send remittances depending on gender, level of education or skill, and length of stay abroad; yet the bilateral remittance values point to the effect of magnitude of migration as well as the perpetuation of ties between migration source and destinations. For instance, remittances from the United States to Nigeria between 2013 and 2016 reflect declining migrant stock to the United States over the same period, and as with migration, the upward trend resumes in 2017. Thus, remittance values in the last decade are reflective of migrant presence at the OECD-10 destinations.

Nigeria is distinctly the top remittance receiving country in the sample size with a total value of 12,720,706,000 USD in the year 2017 alone. In the same year Morocco received less than half the value of remittances for Nigeria at 5,341,727,000 USD even though Nigeria had only about a third of the migrant stock of Morocco. This suggests that the profiles on migrants from Morocco are those who tend to maintain fewer ties with their source country than Nigerians. The other countries in order of value of remittances in USD are Egypt (1,928,314,000), Kenya (1,487,942,000), Ghana (1,271,062,000) and South Africa (463,926,000). South Africa, like the case of Morocco had smaller proportion of remittances relative to migrant stock in OECD-10. Mauritius, a small country with, relative to size, large migration volumes had significant remittance inflows at 174,741,000 USD. Seychelles (8,553,000), Malawi (5,967,000), and Botswana (703,000) had lowest remittances, which reflected their scale of migration.

## Table 4.2:Bilateral remittance estimates to Africa, 2010 – 2017 (thousands of US$)

| | Northern Africa | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Egypt | | | | | | | | | Morocco | | | | | | | | |
| Source of remittances | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Sum | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Sum |
| Canada | 182984 | 207190 | 296738 | 239921 | 263514 | 248011 | 223158 | 268793 | 1930309 | 100714 | 113961 | 108267 | 108044 | 110095 | 110430 | 108602 | 114416 | 874529 |
| France | 106045 | 119911 | 171737 | 150906 | 166794 | 156486 | 142860 | 172075 | 1186814 | 1811962 | 2048718 | 1946361 | 2113158 | 2171878 | 2172391 | 2175548 | 2292018 | 16732034 |
| Germany | 80956 | 91977 | 131730 | 97229 | 107416 | 101011 | 91916 | 110713 | 812948 | 240299 | 272963 | 259325 | 293127 | 301006 | 301284 | 300673 | 316769 | 2285446 |
| United Kingdom | 106859 | 120326 | 172332 | 149040 | 165131 | 155421 | 142111 | 171172 | 1182392 | 27065 | 30450 | 28929 | 51983 | 53605 | 53858 | 54041 | 56934 | 356865 |
| United States | 542525 | 614524 | 880126 | 912807 | 1005720 | 945024 | 858073 | 1033548 | 6792347 | 199752 | 225714 | 214437 | 172290 | 176227 | 175775 | 175063 | 184435 | 1523693 |
| Netherlands | 44538 | 50669 | 72568 | 63700 | 70999 | 66934 | 60740 | 73161 | 503309 | 378322 | 430155 | 408664 | 408425 | 424378 | 426014 | 423713 | 446397 | 3346068 |
| Norway | 2948 | 3371 | 4828 | 5522 | 6028 | 5695 | 5043 | 6074 | 39509 | 15494 | 17666 | 16784 | 12935 | 13066 | 13088 | 12638 | 13314 | 114985 |
| Spain | 15413 | 17344 | 24841 | 19669 | 21648 | 20308 | 18635 | 22446 | 160304 | 1624353 | 1828124 | 1736789 | 1699454 | 1737145 | 1741430 | 1754365 | 1848287 | 13969947 |
| Sweden | 11058 | 12582 | 18021 | 27608 | 30470 | 28597 | 26134 | 31478 | 185948 | 14010 | 15937 | 15140 | 20354 | 20873 | 20842 | 20912 | 22032 | 150100 |
| Switzerland | 21036 | 23727 | 33982 | 33714 | 37576 | 35268 | 32257 | 38854 | 256414 | 25761 | 28948 | 27502 | 43051 | 44709 | 44487 | 44730 | 47125 | 306313 |
| Total | 1114362 | 1261621 | 1806903 | 1700116 | 1875296 | 1762755 | 1600927 | 1928314 | 13050294 | 4437732 | 5012636 | 4762198 | 4922821 | 5052982 | 5059599 | 5070285 | 5341727 | 39659980 |

| | Southern Africa | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Botswana | | | | | | | | | South Africa | | | | | | | | |
| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Sum | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Sum |
| **Canada** | 281 | 280 | 245 | 313 | 362 | 265 | 249 | 176 | 2171 | 64162 | 69509 | 63923 | 57272 | 53658 | 48473 | 43906 | 52198 | 453101 |
| **France** | 215 | 213 | 187 | 31 | 35 | 26 | 25 | 17 | 749 | 4533 | 4908 | 4513 | 6054 | 5706 | 5144 | 4717 | 5608 | 41183 |
| **Germany** | 166 | 166 | 145 | - | - | 0 | 0 | 0 | 477 | 10852 | 11784 | 10837 | 13575 | 12784 | 11533 | 10559 | 12553 | 94477 |
| **United Kingdom** | 3002 | 2977 | 2607 | - | - | 0 | 0 | 0 | 8586 | 301331 | 325262 | 299123 | 258070 | 243805 | 220454 | 202430 | 240660 | 2091135 |
| **United States** | 2217 | 2202 | 1929 | 518 | 597 | 438 | 415 | 292 | 8608 | 114022 | 123486 | 113563 | 131820 | 123776 | 111432 | 101951 | 121206 | 941256 |
| **Netherlands** | 238 | 237 | 208 | 161 | 187 | 137 | 130 | 92 | 1390 | 16861 | 18323 | 16850 | 16664 | 15821 | 14302 | 13064 | 15531 | 127416 |
| **Norway** | 161 | 161 | 141 | 94 | 107 | 79 | 73 | 52 | 868 | 1668 | 1817 | 1671 | 1901 | 1769 | 1598 | 1431 | 1701 | 13556 |
| **Spain** | 38 | 38 | 33 | - | - | 0 | 0 | 0 | 109 | 3395 | 3665 | 3370 | 2945 | 2766 | 2497 | 2298 | 2732 | 23668 |
| **Sweden** | 76 | 76 | 67 | 76 | 88 | 64 | 61 | 43 | 551 | 2325 | 2527 | 2324 | 2847 | 2679 | 2413 | 2217 | 2636 | 19968 |
| **Switzerland** | 30 | 30 | 26 | 54 | 63 | 46 | 44 | 31 | 324 | 7292 | 7872 | 7240 | 9741 | 9242 | 8308 | 7655 | 9101 | 66451 |
| **Total** | 6424 | 6380 | 5588 | 1247 | 1439 | 1055 | 997 | 703 | 23833 | 526441 | 569153 | 523414 | 500889 | 472006 | 426154 | 390228 | 463926 | 3872211 |

| | Western Africa | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ghana | | | | | | | | | Nigeria | | | | | | | | |
| **Source of remittances** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **Sum** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **Sum** |
| **Canada** | 5371 | 5919 | 5915 | 4354 | 92459 | 76633 | 78382 | 81752 | 350785 | 438278 | 455134 | 454018 | 409793 | 408721 | 400448 | 398764 | 435546 | 3400702 |
| **France** | 1167 | 1285 | 1284 | 1261 | 5678 | 22370 | 23490 | 24500 | 81035 | 71785 | 74430 | 74248 | 110566 | 111354 | 108728 | 110563 | 120761 | 782435 |
| **Germany** | 8372 | 9285 | 9279 | 6219 | 34008 | 110376 | 115310 | 120269 | 413118 | 588801 | 614935 | 613428 | 641602 | 645711 | 631172 | 640078 | 699119 | 5074846 |
| **United Kingdom** | 22881 | 24990 | 24973 | 15153 | 480602 | 271727 | 286140 | 298444 | 1424910 | 3741995 | 3851786 | 3842342 | 3729437 | 3770167 | 3700325 | 3771105 | 4118952 | 30526109 |
| **United States** | 30149 | 33127 | 33105 | 31920 | 433808 | 561337 | 584733 | 609877 | 2318056 | 5919821 | 6141002 | 6125945 | 5731505 | 5744281 | 5594076 | 5667740 | 6190533 | 47114903 |
| **Netherlands** | 3069 | 3407 | 3405 | 2792 | 10116 | 50612 | 52619 | 54881 | 180901 | 144732 | 151401 | 151030 | 149081 | 152085 | 149171 | 150703 | 164604 | 1212807 |
| **Norway** | 514 | 572 | 572 | 420 | 7503 | 7314 | 7296 | 7610 | 31801 | 23014 | 24198 | 24139 | 38847 | 38395 | 37588 | 36775 | 40167 | 263123 |
| **Spain** | 3260 | 3564 | 3562 | 2712 | 4461 | 47820 | 50660 | 52838 | 168877 | 909324 | 935831 | 933536 | 705013 | 705333 | 690280 | 705944 | 771060 | 6356321 |
| **Sweden** | 361 | 401 | 401 | 482 | 11659 | 8517 | 8967 | 9352 | 40140 | 29475 | 30852 | 30776 | 84909 | 85319 | 83165 | 84877 | 92707 | 522080 |
| **Switzerland** | 527 | 574 | 574 | 585 | 13324 | 10480 | 11063 | 11539 | 48666 | 48761 | 50206 | 50082 | 78664 | 80227 | 77924 | 79888 | 87257 | 553009 |
| **Total** | 75671 | 83124 | 83070 | 65898 | 1093618 | 1167186 | 1218660 | 1271062 | 5058289 | 12000000 | 12329775 | 12299544 | 11679417 | 11741593 | 11472877 | 11646437 | 12720706 | 95890349 |

| | Eastern Africa | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Kenya | | | | | | | | | Malawi | | | | | | | | |
| Source of remittances | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Sum | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Sum |
| Canada | 48706 | 66489 | 87377 | 88229 | 92459 | 100249 | 108608 | 123010 | 715127 | 114 | 118 | 109 | 155 | 152 | 208 | 162 | 177 | 1195 |
| France | 1893 | 2579 | 3390 | 5313 | 5678 | 6127 | 6842 | 7749 | 39571 | 19 | 20 | 18 | 24 | 24 | 33 | 27 | 29 | 194 |
| Germany | 14243 | 19568 | 25715 | 32100 | 34008 | 36744 | 40794 | 46203 | 249375 | 40 | 42 | 38 | 0 | - | 0 | 0 | 0 | 120 |
| United Kingdom | 274843 | 371379 | 488051 | 446343 | 10116 | 522587 | 585452 | 663088 | 3361859 | 4200 | 4299 | 3954 | 3962 | 3988 | 5506 | 4499 | 4921 | 35329 |
| United States | 175656 | 239700 | 315004 | 415305 | 7503 | 466102 | 515823 | 584225 | 2719318 | 521 | 540 | 497 | 546 | 538 | 730 | 579 | 634 | 4585 |
| Netherlands | 4333 | 5966 | 7840 | 9354 | 4461 | 10983 | 12126 | 13734 | 68797 | 58 | 61 | 56 | 78 | 80 | 111 | 88 | 96 | 628 |
| Norway | 3247 | 4501 | 5915 | 7386 | 11659 | 8117 | 8555 | 9689 | 59069 | 11 | 12 | 11 | 40 | 38 | 52 | 38 | 42 | 244 |
| Spain | 2837 | 3830 | 5033 | 4185 | 13324 | 4833 | 5452 | 6175 | 45669 | 16 | 16 | 15 | 0 | - | 0 | 0 | 0 | 47 |
| Sweden | 3353 | 4618 | 6069 | 11031 | 480602 | 12547 | 14055 | 15918 | 548193 | 12 | 13 | 12 | 21 | 21 | 29 | 23 | 26 | 157 |
| Switzerland | 4310 | 5835 | 7669 | 12455 | 433808 | 14262 | 16026 | 18151 | 512516 | 14 | 14 | 13 | 35 | 35 | 48 | 39 | 42 | 240 |
| Total | 533421 | 724465 | 952063 | 1031701 | 1093618 | 1182551 | 1313733 | 1487942 | 8319494 | 5005 | 5135 | 4723 | 4861 | 4876 | 6717 | 5455 | 5967 | 42739 |

| Islands | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mauritius | | | | | | | | | Seychelles | | | | | | | | |
| Source of remittances | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Sum | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Sum |
| Canada | 18278 | 20125 | 19928 | 17219 | 17149 | 17151 | 16976 | 17872 | 144698 | 1467 | 2153 | 2186 | 1397 | 1584 | 1781 | 2375 | 2537 | 15480 |
| France | 64112 | 70549 | 69860 | 66926 | 66985 | 66882 | 66860 | 70388 | 542562 | 615 | 902 | 916 | 828 | 943 | 1059 | 1424 | 1521 | 8208 |
| Germany | 2140 | 2361 | 2338 | - | - | 0 | 0 | 0 | 6839 | 466 | 684 | 695 | - | - | 0 | 0 | 0 | 1845 |
| United Kingdom | 66986 | 73535 | 72816 | 71542 | 71741 | 71799 | 71855 | 75647 | 575921 | 5434 | 7962 | 8084 | - | - | 0 | 0 | 0 | 21480 |
| United States | 3217 | 3540 | 3506 | 4693 | 4680 | 4669 | 4642 | 4887 | 33834 | 1224 | 1795 | 1823 | 1911 | 2170 | 2433 | 3259 | 3482 | 18097 |
| Netherlands | 543 | 599 | 593 | 554 | 557 | 558 | 555 | 584 | 4543 | 119 | 175 | 178 | 119 | 136 | 153 | 205 | 219 | 1304 |
| Norway | 356 | 394 | 390 | 302 | 299 | 299 | 292 | 308 | 2640 | 28 | 41 | 42 | 17 | 19 | 22 | 29 | 31 | 229 |
| Spain | 713 | 782 | 775 | - | - | 0 | 0 | 0 | 2270 | 111 | 162 | 165 | - | - | 0 | 0 | 0 | 438 |
| Sweden | 286 | 315 | 312 | 276 | 276 | 275 | 275 | 289 | 2304 | 92 | 135 | 137 | 89 | 101 | 114 | 153 | 163 | 984 |
| Switzerland | 3774 | 4143 | 4103 | 4527 | 4550 | 4534 | 4527 | 4766 | 34924 | 324 | 474 | 481 | 327 | 373 | 418 | 562 | 600 | 3559 |
| Total | 160405 | 176343 | 174621 | 166039 | 166237 | 166167 | 165982 | 174741 | 1350535 | 9880 | 14483 | 14707 | 4688 | 5326 | 5980 | 8007 | 8553 | 71624 |

Source: Compiled by author from World Bank, 2018 Bilateral Remittances Matrix using Migrant Stocks, Host Country Incomes, and Origin Country Income.

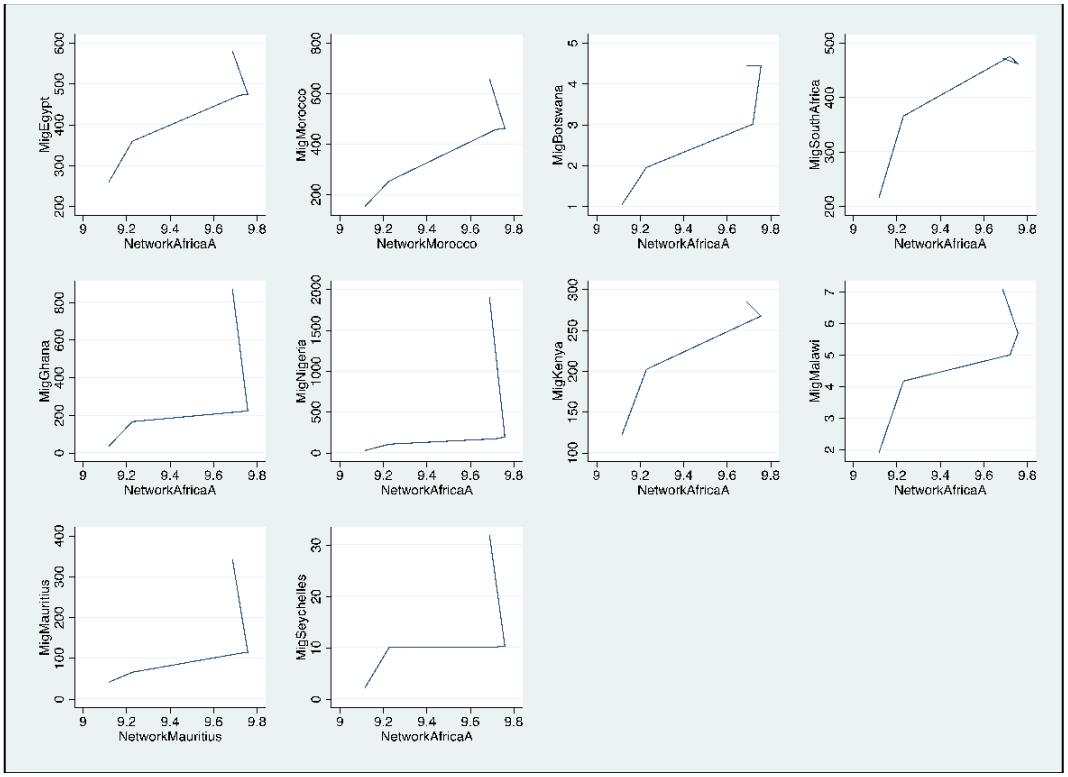
*Note: Zero means there were no remittances in that period, blanks mean the data is unavailable.*

The set of graphs in Figure 4.7 investigates the relationship between remittance outflows from destination countries on the horizontal axis and migration from Africa-10. The literature shows that migration generally rises with networks as those who migrate previously facilitate migration of others from their country of origin by pooling resources to fund their migration or sharing housing, and information about employment at the destination. Since most of the source countries considered are former British colonies, it implies that network effects measured this way are the same for all those African countries and only, Mauritius a former colony of Portugal, and, the case of Morocco whose historical ties are jointly with Spain and France, have different network patterns. Given the absence of these ties with the new destinations, one of the objectives that the thesis sets out to achieve is to explain why migration moves in that direction in the absence of networks. If migration occurred in the absence of networks the relationship between countries with no network (x-axis) and migration (y-axis) would be a flat horizontal curve and are not reported below.

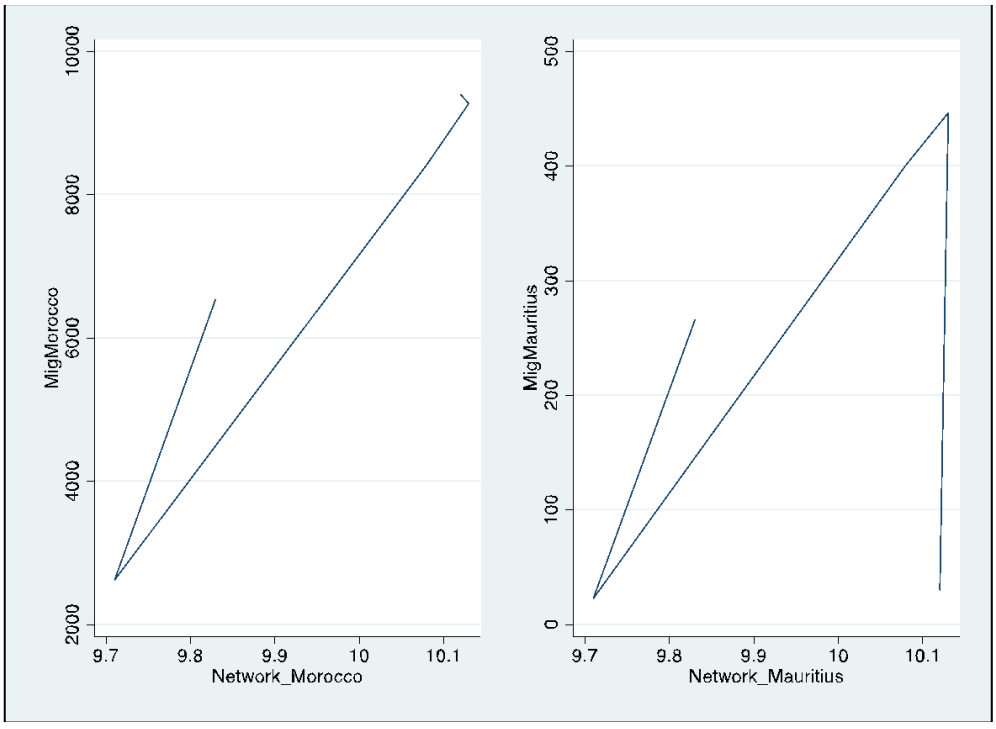
The relationships observable from Figure 4.7 vary significantly. In some cases, as demonstrated in the case of migration between Morocco and Germany, networks appear to encourage migration up to a point after which saturation seems to set in. A similar pattern is registered in the United States, particularly regarding migration from Botswana, South Africa, Ghana, Nigeria, Malawi, Seychelles and Mauritius. Only Northern Africa and Kenya do not fit into this pattern observed in the United States.

It has been documented in the migration literature that networks may also discourage future migrants, particularly when destination country conditions are perceived as becoming less favourable for existing migrants. In that view, while the other graphs representing migration and networks in the United Kingdom show an upward relationship between the two variables, in exceptional cases for source economies such as Egypt, Morocco, and Ghana, higher remittances, or in other words stronger networks, are sometimes associated with lower migrant stock below a certain threshold.

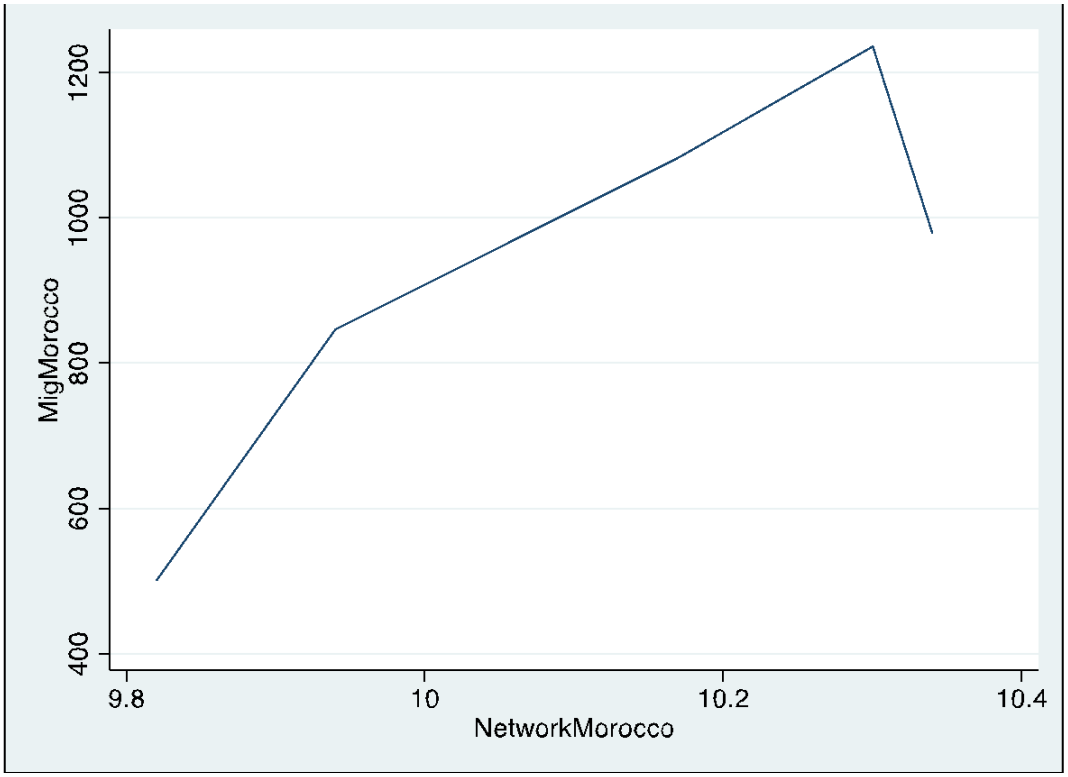
## 1. Canada



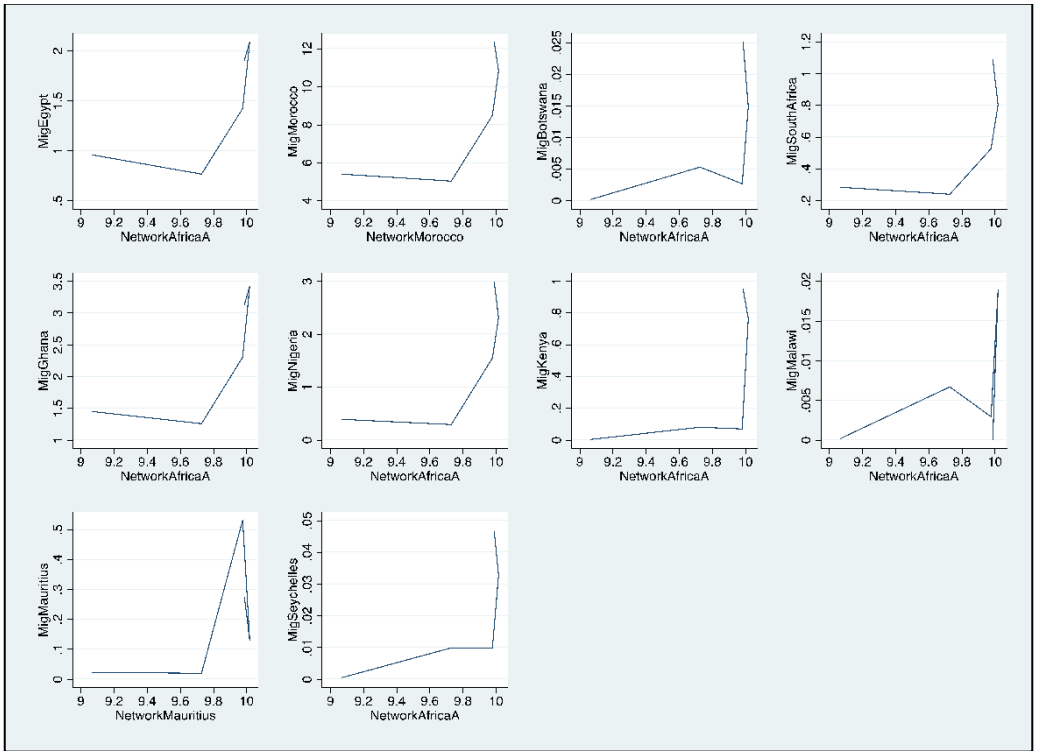

## 2. France



## 3. Germany




## 4. United Kingdom



## 5. United States

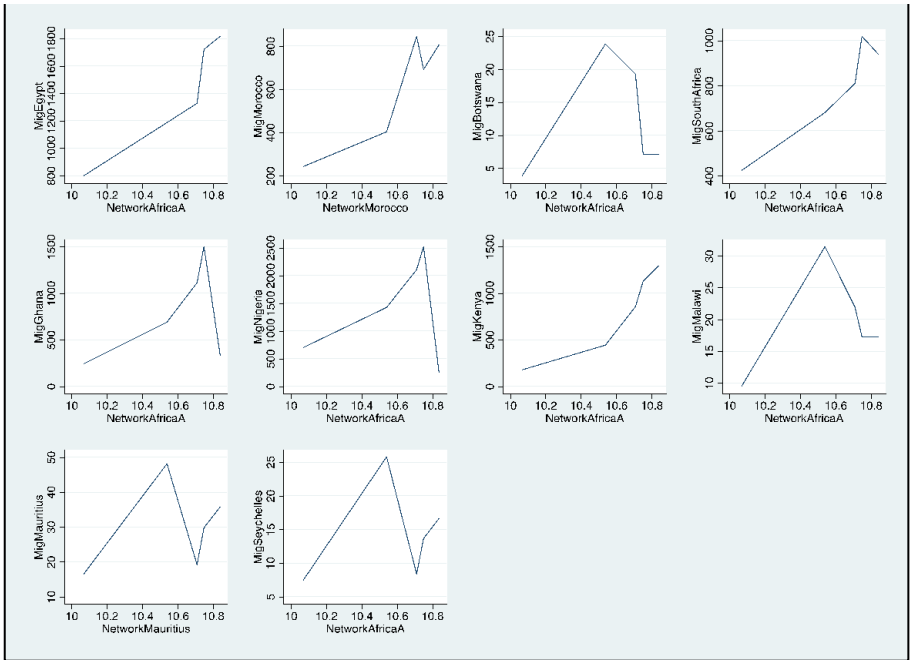



**Figure 4.7: Marginal effects of networks on migration from Africa, 1990 to 2017**

Source: Computed by author from World Bank, Bilateral Estimates of Migrant stock (GBMB), 2018 and World Development Indicators[30] database, 2017

[30] Networks are measured as an interaction between remittances, in constant USD and the binary network variable as defined in this thesis

**Migration costs and migrant destinations**

Migration costs in this thesis vary with distance, and restrictive policy. The total number of migrants for all countries that became emigration disperse in 1990 was predictably higher to Spain than more distant Netherlands, Sweden, and Norway (particularly Cameroon-Netherland against Cameroon-Spain, Cape Verde-Netherlands versus Spain, Ghana-Netherlands and Gambia-Norway).[31] Notably, only the Netherlands is farther North than some previous popular destinations such as France, Italy and Germany. Observably, Netherlands and Spain became immigrant destinations for thirteen new countries each, Sweden and Switzerland, countries with good living standards, are also new destinations.

Furthermore, most new emigrants are from Western and Eastern Africa, and fewer from Southern Africa; and the increasing migration may be associated with rising income, and therefore improved capabilities to migrate between countries. The longest distance covered by Africa-10 migrants over the period has been to the US (Mauritius, Seychelles, Kenya, Ghana, Nigeria, Morocco, Egypt) and Canada (Malawi, Botswana and South Africa). Indeed, the African migrants that travel the longest average distance in descending order are from Mauritius (10,525 $km^2$), Malawi (9,758 $km^2$), South Africa (9,602 $km^2$), Botswana (9,419 $km^2$), Seychelles (8,973 $km^2$), Kenya (7,719 $km^2$), Ghana (5,837 $km^2$), Nigeria (5,737 $km^2$), Egypt (4,405 $km^2$), and Morocco (3,024 $km^2$).

**Destination country policy; by area of intervention**

The DEMIG database categorises target groups so that policies that apply to all migrants can be separated from those that apply to distinct population groups such as asylum seekers and refugees, and this thesis took advantage of the distinction by migrant populations. In collecting the data, only policy restrictiveness that was targeted at all nationalities or that affected specific nationalities of interest in this thesis (Africa-10) were counted. That is, where the change affected at least one of the countries of the study then it was accounted

[31] For selection of core and emerging destinations please see Appendix 1

for. As an example, labour agreements between Germany and Morocco, when more restrictive were counted with +1. When the data affected citizens of the same country, such as the New Citizenship Law of Sweden in 2011, which accorded Swede citizenship to children born of Swedish fathers regardless of the mother's nationality, as long as they were either born in Sweden or the parents were married, it was recorded as less restrictive (-1) for that period, because it could indirectly affect Africa-10 citizens.

In other cases, where the rules applied specifically to citizens outside the scope of this study, they were not captured, for instance, labour market agreements between Sweden and the European Economic Area (EEA) that pertained to Swedish citizens. Given that the DEMIG category "no change" does not allow a comparison of restrictiveness across time, it could not be accounted for in this thesis. It is notably difficult to ascertain overall policy restrictiveness, and the DEMIG uses ordinal variables, which as the authors (De Haas, Natter and Vezzoli, 2015) mention, are useful for relative comparisons of restrictiveness rather than an overall indicator of openness. Nevertheless, a few generalisations can be made based on the number of policy measures aimed at controlling migrant population.

Table 4.3 is a frequency count of policy changes at all global north destination, sorted by type of change, that is, whether more or less restrictive, and magnitude of change, ranging from fine-tuning to major change. A column in the more restrictive major change section is dedicated to separating refugees and asylum seekers and irregular migrants from the larger migrant population.

It is observable from Table 4.3, that OECD-5 has had more policy interventions than OECD-N over the period 1960 to 2014, signifying that migration policy had a more prominent role in the previously common destinations from an early period. Many of the policy interventions in the new destinations were to accommodate the needs of migrants, for instance, lowered restrictions on family reunification, ease of access to labour market for skilled workers or access to work permits for foreign students and graduates. All of the destinations, except Germany and France, made more frequent, more restrictive policy changes than less restrictive ones in the final period 2010 to 2014.

While the DEMIG policy database recorded overall higher number of less restrictive than more restrictive policy interventions, the United Kingdom and United States stand as

exceptions, given their overall more frequent restrictions on entry and stay, integration and exit. The global north is also more restrictive especially in relation to African migrants. Specifically, when less restrictive policy was separated by specific nationalities, often none of the lowered restrictions targeted African populations and policy was more open to African migrants mostly in cases where all other nationalities were affected. Also, significantly, fewer labour market agreements exist between African countries and the global north.

In addition, recent openness has favoured countries' regional arrangements, for instance, separation between EU and Non-EU citizens, against the rest of the world. Spain has the highest number of bilateral agreements with African countries among the destinations considered. Moreover, high skilled workers have fewer restrictions compared to low skilled, as seen for instance in Switzerland in the year 2008 closing migration channels for non-EU, low skilled workers. Policies in United Kingdom, United States and Netherlands have also been less open in the last two decades relative to previous periods.

The frequencies were sorted in three categories, so that "I" refers to one policy change; "II" captures between two to five changes and category III is for interventions greater than five. This classification results in 16 changes in category I, six changes in category II, and one change in category III. In total, out of these, seven more restrictive category I changes, and four category II changes were made by the new destinations. That means the OECD-5 made twice as m category I type changes. This information allows us to focus on a discussion by category of changes.

It was shown earlier that migration to OECD-5 is mostly increasing, apart from the United Kingdom and United States, where there was a dip in migrant stock the last decade, which coincides with significantly more frequent restrictive interventions made to their migration policy in the recent period as shown in Table 4.3 below. Migration policy in the global north has tended to be more selective over time, in terms of education and skill requirements. It is observable from the table that migration policy appears responsive rather than pro-active, that is, major changes increasing the restrictiveness of migration occur as migration to the country is rising. Increased migration in responses to restrictive policy has been conceptualised by de Haas (2011) as inter-temporal substitution effects, where people who

would otherwise be mobile and responsive to market conditions become stuck as they perceive that they cannot return once they leave a particular place. Destination countries tend to have higher migration flows from countries with which they have had labour market and similar policy agreements such as the case of Morocco to Germany.

**Table 4.3: Restrictive policy changes in global north, by target origin, 1960 to 2014**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Canada** | | | | | | | | | | |
| | **Fine-tuning** | | **Minor** | | **Mid-level** | | **Major** | | | **Overall** |
| **1960 to 1969** | 1 | 0 | 0 | -1 | 1 | -2 | 0 | 0 | -4 | **-5** |
| **1970 to 1979** | 0 | 0 | 1 | -3 | 1 | 0 | 3 | 2 | -4 | **-2** |
| **1980 to 1989** | 0 | 0 | 3 | -8 | 5 | -3 | 1 | 0 | -5 | **-7** |
| **1990 to 1999** | 3 | -2 | 2 | -2 | 5 | -4 | 5 | 2 | -1 | **6** |
| **2000 to 2009** | 3 | -6 | 3 | -13 | 7 | -9 | 4 | 2 | -2 | **-13** |
| **2010 to 2014** | 4 | -3 | 5 | 0 | 10 | -4 | 3 | 3 | -1 | **14** |
| **France** | | | | | | | | | | |
| **1960 to 1969** | 0 | 0 | 0 | 0 | 1 | -1 | 0 | 0 | 0 | **0** |
| **1970 to 1979** | 0 | 0 | 2 | -4 | 3 | 0 | 6 | 5 | 0 | **7** |
| **1980 to 1989** | 0 | -1 | 3 | -7 | 2 | 0 | 7 | 4 | -4 | **0** |
| **1990 to 1999** | 1 | -1 | 9 | -2 | 5 | -4 | 5 | 2 | 0 | **13** |
| **2000 to 2009** | 2 | -1 | 11 | -3 | 4 | -9 | 5 | 2 | -1 | **8** |
| **Germany** | | | | | | | | | | |
| **1960 to 1969** | 0 | 0 | 0 | -1 | 0 | -2 | 0 | 0 | -5 | **-8** |
| **1970 to 1979** | 0 | 0 | 0 | -4 | 2 | 0 | 2 | 1 | -5 | **-5** |
| **1980 to 1989** | 0 | -1 | 1 | -1 | 0 | 0 | 3 | 0 | 0 | **2** |
| **1990 to 1999** | 1 | -1 | 2 | 0 | 1 | 0 | 2 | 0 | -4 | **0** |
| **2000 to 2009** | 1 | -2 | 2 | -8 | 2 | -7 | 3 | 3 | -1 | **-11** |
| **2010 to 2014** | 1 | -3 | 0 | -1 | 0 | -4 | 0 | 0 | -1 | **-9** |
| **United Kingdom** | | | | | | | | | | |
| **1960 to 1969** | 1 | 0 | 0 | -1 | 1 | 0 | 1 | 1 | -2 | **0** |
| **1970 to 1979** | 1 | 0 | 0 | -2 | 0 | 0 | 0 | 0 | 0 | **-1** |
| **1980 to 1989** | 1 | -1 | 1 | -2 | 2 | 0 | 3 | 2 | 0 | **4** |
| **1990 to 1999** | 1 | 0 | 2 | 0 | 0 | -2 | 4 | 1 | -1 | **4** |
| **2000 to 2009** | 4 | -4 | 5 | -2 | 6 | -8 | 11 | 8 | -2 | **10** |
| **2010 to 2014** | 5 | 0 | 1 | -1 | 3 | -3 | 1 | 1 | 0 | **6** |
| **United States** | | | | | | | | | | |
| **1960 to 1969** | 1 | 0 | 1 | -1 | 0 | -1 | 0 | 0 | -1 | **-1** |
| **1970 to 1979** | 1 | 0 | 0 | -1 | 0 | -3 | 1 | 1 | 0 | **-2** |
| **1980 to 1989** | 1 | -1 | 1 | 1 | 0 | -3 | 3 | 3 | 0 | **2** |
| **1990 to 1999** | 2 | -2 | 5 | -3 | 2 | -3 | 4 | 1 | -2 | **3** |
| **2000 to 2009** | 5 | -3 | 7 | -1 | 3 | -5 | 2 | 2 | -1 | **7** |
| **2010 to 2014** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |

| Netherlands | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Fine-tuning | | Minor | | Mid-level | | Major | | | Overall |
| **1960 to 1969** | 0 | -3 | 0 | -1 | 0 | -3 | 3 | 2 | -5 | **-9** |
| **1970 to 1979** | 0 | -2 | 0 | -2 | 2 | -4 | 2 | 2 | -5 | **-9** |
| **1980 to 1989** | 3 | -3 | 1 | 0 | 2 | -4 | 1 | 0 | -3 | **-3** |
| **1990 to 1999** | 1 | -1 | 4 | -1 | 5 | -4 | 9 | 4 | -2 | **11** |
| **2000 to 2009** | 5 | -6 | 3 | -4 | 5 | -7 | 4 | 3 | 0 | **0** |
| **2010 to 2014** | 3 | -2 | 6 | -1 | 0 | -5 | 2 | 2 | -1 | **2** |
| **Norway** | | | | | | | | | | |
| **1960 to 1969** | 0 | -1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **-1** |
| **1970 to 1979** | 0 | 0 | 0 | -1 | 0 | 0 | 4 | 3 | 0 | **3** |
| **1980 to 1989** | 0 | -2 | 0 | -1 | 0 | 0 | 1 | 1 | -3 | **-5** |
| **1990 to 1999** | 0 | 0 | 3 | -1 | 0 | -1 | 2 | 2 | -2 | **1** |
| **2000 to 2009** | 0 | -4 | 8 | -5 | 1 | -4 | 8 | 3 | -1 | **3** |
| **2010 to 2014** | 0 | -3 | 3 | -1 | 1 | -1 | 2 | 2 | 0 | **1** |
| **Spain** | | | | | | | | | | |
| **1960 to 1969** | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | -1 | **0** |
| **1970 to 1979** | 0 | 0 | 0 | 0 | 0 | -1 | 3 | 3 | 0 | **2** |
| **1980 to 1989** | 0 | 0 | 0 | -3 | 0 | -1 | 2 | 1 | -1 | **-3** |
| **1990 to 1999** | 1 | -2 | 0 | -4 | 1 | -2 | 2 | 0 | -3 | **-7** |
| **2000 to 2009** | 0 | -2 | 4 | -2 | 1 | -7 | 2 | 0 | -7 | **-11** |
| **2010 to 2014** | 0 | 0 | 1 | -1 | 0 | -1 | 4 | 4 | 0 | **3** |
| **Sweden** | | | | | | | | | | |
| **1960 to 1969** | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 1 | -2 | **2** |
| **1970 to 1979** | 0 | 0 | 0 | -1 | 0 | -2 | 1 | 1 | -2 | **-4** |
| **1980 to 1989** | 0 | -1 | 1 | 0 | 0 | 0 | 2 | 1 | -1 | **1** |
| **1990 to 1999** | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | -2 | **1** |
| **2000 to 2009** | 0 | 0 | 0 | -4 | 0 | -2 | 2 | 2 | -6 | **-10** |
| **2010 to 2014** | 1 | 0 | 1 | -1 | 1 | 0 | 1 | 1 | -1 | **2** |
| **Switzerland** | | | | | | | | | | |
| **1960 to 1969** | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | **2** |
| **1970 to 1979** | 0 | 0 | 2 | -4 | 0 | 0 | 1 | 1 | -2 | **-3** |
| **1980 to 1989** | 0 | -1 | 1 | -1 | 0 | 0 | 2 | 0 | -1 | **0** |
| **1990 to 1999** | 0 | -1 | 3 | -2 | 2 | 0 | 1 | 0 | -1 | **2** |
| **2000 to 2009** | 0 | 0 | 0 | -4 | 3 | -1 | 2 | 1 | -1 | **-1** |
| **2010 to 2014** | 0 | 0 | 0 | 0 | 1 | -1 | 2 | 1 | 0 | **2** |

*Source: Derived by author from Determinants of International Migration (DEMIG) database, International Migration Institute, Oxford University, 2015.*

*Note: a positive sign implies more restrictive, zero means zero changes and negative reflects less restrictive policy change. More restrictive policy target at selected migrant populations, that is, all migrant populations except refugees and asylum seekers, are highlighted*

## 4.2 A summary of statistics

The key statistical measures of central tendency, dispersion and symmetry are presented in Table 4.4 that follows. Agglomeration theory focuses on the market pull of destination country conditions and the thesis shows a fairly diverse set of destinations of migration from Africa-10. The dispersion measures are relatively close to the mean for data on employment in agriculture and wage potential, while the destinations considered differ substantially in population, geographical size, remittance outflows, total labour employment and labour supply in manufactures and services. The descriptive statistics generated delineates the data used in the regression analysis.

The mean value of labour in the service sector is highest and almost twice as much as manufactures. It indicates that in the OECD-10, in recent decades, labour has been concentrated in the service sector. Data construction for the model was an important part of the analysis. For example, sectoral labour employment for manufactures has been measured differently over time, in earlier periods it was reported as employment in industry, in other countries a combination of industry and construction was reported and about the start of the millennium it was reported as manufactures. In order to adjust for some of these differences, the total employment in industry, construction and manufactures was taken. A second reason for this measure is that total employment in manufactures provided a more complete data set, in the cases of missing variables. Industry, construction and manufactures when considered separately did not provide better results.

A number of destinations deviated significantly from the mean in terms of labour employment in manufactures (Germany, United Kingdom and United States) as well as services (Germany, United Kingdom and United States and Spain). The difference in employment among the countries was largest in the service sector, indicated through the standard deviation. Nonetheless, data were symmetrical in each of three employment sectors, showing that both the mean and median were close together for the sample.

A single indicator was generated as the product of employment rate and nominal wages to represent the wage potential at the destination (probw). This reduced the problem of multicollinearity, since the measurement of wages and employment are correlated. The values are moderately positively skewed, which is expected for data on income, since it reflects between country inequalities. Nominal wages across the sample included relatively larger values from the United States (60,558 USD/annum) and Netherlands (52,876 USD/annum) compared to the minimum of 38,507 USD per annum in Spain. Wage potential was platykurtic, rather than being spread symmetrically around the mean, with lighter tails and a flatter peak than a normal distribution. The flatter peak is reflective of fewer outliers than for normal distributions, despite the diverse individual country conditions.

In the case of size, the number of observations is omitted in the table as surface area varies by countries represented in the panel but is constant over time. The data on size is leptokurtic indicating outliers, since the sample size includes geographically large countries like the US and small-sized Switzerland. The population variable reflects similar high standard deviations. Indeed, such differences between destination country conditions allow the thesis to account for how these drive African migrants' spatial distribution.

The ideal measure to capture network effects would be bilateral remittances; however, that information is not available for Africa earlier than 2010. Three options exist in the migration literature to estimate presence of networks between source and destination; these are remittances, migration from a previous period and a binary representation of historical ties. Since bilateral remittances were not available for the entire period of study, and it is assumed that some of the destinations are recent, two of the other possible measures were interacted to get a more robust explanatory variable. That is, remittance outflows from OECD-10 were linearised by taking the natural logarithm; they were subsequently interacted with a set of binary variables representing the presence colonial and language ties, or labour market agreements.[32] The unique case of labour market agreements between Germany and Morocco over the period was reflected in the network specification.

Three separate network variables resulted labelled as network Mauritius, Morocco and Africa-others. The distinction arises since the set of source countries are all former British

[32] A table showing the derivation of the binary network variable is reported in appendix 9.

colonies, except for Mauritius and Morocco. The mean reflects that networks between Morocco and the global north are highest relative to the rest of Africa. Minimum values of zero for the network variable reflect the plausible situation of missing networks between a country in Africa-10 and the OECD-10 destinations, as is the case of Mauritius to Netherlands in 1990.

The African countries fall into three categories of network connections, so it became impossible to check the effects of alternative specifications of historical ties, such as the impact of Moroccan networks on Egyptian migration; since the network defined variables interact with one another. Explicitly, it was impossible to use all three network values in the same regression. Additionally, as at 1990, some of the more recent destinations had no migration from Africa, and for these, networks were recorded as zero throughout the period. That is, whether networks exist or not was treated as a static condition rather than a dynamic one.

It is possible to measure network effects as dynamic using migration from a previous period. This measure was tested by interacting lagged values of migration with the network variable; nonetheless, the impact did not differ significantly from the earlier interacted term, and as it presents methodological challenges of multicollinearity in the general model, it was excluded. The network variable was symmetric and the standard deviation from the mean shows that the numbers are not spread out over too large values. This is expected since the natural log values were taken.

Using the values from the DEMIG database, for the period between 1990 and 2014, three categories were generated based on more restrictive major policy changes. These were then dichotomised to represent three policy measures, PI to PIII, in increasing order of more restrictive major policy change. Given that the data is disaggregated by target migrant group (migrants, skilled and highly skilled workers, low skilled workers, undocumented migrants, refugees and asylum seekers, as well as others), the policy measure reported in this thesis is restricted migrant populations.[33] The policy variables for both scenarios are analysed in categories identically defined.

[33] An alternative scenario is reported in appendix 12, to check for robustness of the chosen restricted policy target group and whether policy changes directed at certain migrant populations affect the results.

The frequency of the more restrictive changes affecting all target groups means that for this policy variable of three categories, a third one capturing all migrant populations is significantly bulkier at a multiple of six to one than the population group that excludes refugees, asylum seekers and irregular migrants. The other classifications have more balanced categories, there are marginally more first category changes for the restricted migrant population (16 versus 15) but [marginally] less second category changes (6 vs 7). A restricted sample of only migrants was chosen because theoretically we are modelling migrants' behaviour relative to market conditions. In this restricted sample, category PIII, as described above, represents the highest number of policy changes, but also the data revealed that such frequent, more restrictive, major, policy interventions occurred in fewer countries and periods.

The column presenting skewness values shows that the data is normally distributed with the exception of the first category of major change in restrictive policy, which is positively skewed. The policy category I has a moderate positive skewness that reflects a higher count of restrictive policy changes. This first category of policy shows that most destinations have made at least one more restrictive policy change over each decade of analysis. This first category of intervention occurs most frequently among the three policy variables, as observable in its mean. The second category of major restrictive policy changes, which represents two to five interventions, have moderately heavier tails (leptokurtic), indicating that outliers exist in those particular sets of data. This fits with the observation from the preliminary analysis that core destinations (OECD-5) have a higher incidence of restrictive policy interventions than emerging ones (OECD-N).

The normalised skewness and kurtosis measures in general, reflect that despite the relatively small sample size of analysis, the data tends towards its natural mean, in few exceptions the dispersion from the mean is moderate. In order to further normalise the data, all of the variables described, except the binary ones have been regressed in their natural logarithm form.

**Table 4.4: Summary of statistics for OECD-10; 1990, 2000, 2010, 2017[34]**

| Variable | Unit of measurement | Number of Observations | Mean | Standard Deviation | Min | Max | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|---|
| Total labour employment | Thousands of people | 40 | 24011.30 | 35796.04 | 231.50 | 141897.20 | 0.00 | 0.00 |
| Labour in agriculture | | 40 | 658.25 | 736.20 | 54.42 | 3223.41 | 0.00 | 0.00 |
| Labour in manufactures | | 40 | 11610.35 | 15661.33 | 908.72 | 59624.58 | 0.00 | 0.00 |
| Labour in services | | 40 | 21010.64 | 30445.00 | 945.00 | 124034.70 | 0.00 | 0.00 |
| Wage potential | Interacted variable | 40 | 40660.04 | 9002.80 | 25922.24 | 59301.1 | 0.37 | -0.79 |
| Population | Units | 40 | 61000000 | 82500000 | 4241473 | 326000000 | 0.00 | 0.00 |
| Geographical size | Kilometre-squared | constant | 2211325 | 3825486 | 41284 | 9984670 | 0.00 | 0.40 |
| Remittance outflows from OECD-10 | Constant USD | 40 | 9680000000 | 14100000000 | 159000000 | 69300000000 | 0.00 | 0.00 |
| Network Africa- all others[35] | Interacted variables | 40 | 2.96 | 4.60 | 0.00 | 10.84 | 0.00 | 0.00 |
| Network Morocco | | 40 | 4.82 | 4.94 | 0.00 | 10.84 | 0.00 | 0.00 |
| Network Mauritius | | 40 | 3.96 | 4.92 | 0.00 | 10.84 | 0.00 | 0.00 |
| Restrictive policy, PI | Binary variables | 30 | 0.46 | 0.50 | 0 | 1 | 0.72 | 0.00 |
| Restrictive policy, PII | | 30 | 0.20 | 0.40 | 0 | 1 | 0.00 | 0.40 |
| Restrictive policy, PIII | | 30 | 0.06 | 0.25 | 0 | 1 | 0.00 | 0.00 |

*Source: computed from various datasets described in Table 3.1*

*Note: The restrictive policy data ends in 2014 and is applied to selected regression analysis.*

[34] The summary of statistics for migration stock as well as the distance variable are reported in the appendix as those variables do not fit the format used here, being ten sources (AFRICA-10) to ten destinations (OECD-10)

[35] Colonial and historical ties are country specific, and different for Mauritius and Morocco than for the rest of the Africa-10 which are Egypt, Botswana, South Africa, Malawi, Kenya, Ghana, Nigeria, Seychelles.

## 4.3 Markets and migration costs in African migrant distributions

The model is situated within the discussion of location engendering economic activity, and as a result, migration. Empirical findings suggest that agglomeration economics is an important force driving migration flows and external factors are important determinants of migration patterns (Fujita *et al*, 1999; Crozet, 2004; Russel, 2009; Hering and Paillacar, 2016). Table 4.6 presents the results of gravity model estimates, that is, distance, as well as income [potential wages]; other destination country market conditions including sectoral employment and market size; and also, the effects of networks on migration from each of the African countries to a panel of ten global north destinations.

In terms of suitability of the model, the F-statistics significantly shows a linear relationship between migration and these predictors. The Hausman test showed that fixed effects technique was appropriate in four of the cases (Egypt, South Africa, Nigeria, and Seychelles) while the random effects method was the best predictor in the other instances (Morocco, Botswana, Ghana, Malawi, Kenya, and Mauritius). Fixed effects are suitable for systematic unobserved variations among the panel data (Mummolo and Petterson, 2017). Consequently, the Hausman test helped determine the method used so as to be appropriate to each country dataset. Model 2, reported in the same table, adds policy restrictiveness, measured using the three categories of intervention frequency. The results of both regressions are consistent, that is, the direction of impact is mostly identical and even the magnitude is closely related.

The post estimation model specification tests, Akaike and Bayesian information criteria, were used to distinguish between alternative models estimated; the results reported in this section are those with the optimal specification and other options are reported in the appendix. These information criteria are not discussed in this section, because they cannot compare between models reported given time differences between the two linear models or variations in estimation between the linear models and non-linear one.

The results show that the size of the destination country, which is proxied by population is a consistent predictor of market attraction for Kenya (6%), Mauritius (9%), Egypt (11%), and Malawi (14%) in the first model. The proxy is used to reduce the number of constant parameters that would have resulted from using geographical size, so as to improve the linear model, and to reduce the effect of outliers where leptokurtosis is visible in the summary of statistics. Alternatives to measuring market size such as Gross Domestic Product (in Brakman, Garretsen and Schram, 2002) were found to interact with the other income term, wages, in our thesis. Since our model rests on the attraction that wages offer, it was important to retain the latter.

In studies similar to ours, stronger markets have been associated with destinations with larger surface area and higher population (Ciccone and Hall, 1996). Here population conformed to indications of forward linkages of destinations, which predict that more migrants are located at stronger markets. Destination country population significantly impacts migration in the second model as well as in three of the four cases similar to the first model already presented, namely: Kenya (6%), Egypt (14%), and Malawi (15%) and additionally for Ghana (8%), Botswana (11%), Mauritius (11%), and at less than one per cent for Seychelles. Overall, the model did not behave significantly differently in trials in which the population variable was excluded, so the results that are inclusive of its impacts are reported. In all cases the level of confidence was at most five per cent.

The implication is that as population varies by one unit, migration increases by at least six per cent and up to fifteen per cent. Our study conforms to the findings of Ciccone and Hall (1996), Coniglio (2002), and Hering and Paillacar (2016) who observe that population can be an indicator of market concentration. Congruently, African migrant distributions are significantly higher in already populated global north destinations. Exceptionally, in the case of emigration from South Africa, more populated destinations had fewer migrants by up to seventeen per cent. This reflects lack of emigration diversity from South Africa whose migrants concentrate in three OECD-5 countries; a significant proportion are in the United Kingdom which has relatively smaller population among the sample size.

Czaika and de Haas (2013) showed small countries were more emigration diverse regionally. The results of this regression analysis do not show any consistency with size of

origin country and emigration diversity. Indeed, international migration from smaller African countries such as Malawi and Mauritius showed less dispersion internationally, and, mostly, remained in relatively more populated destinations. For instance, most of migration from Malawi (82%) is directed towards the United Kingdom.

The sector of employment matters in African migrant distribution, with the agricultural sector being the most significant indicator of migration patterns. A similar direction of change in sectoral significance is identified in Crozet (2004); however, in the case of the European countries it was driven by the service sector. In the two models reported in this thesis, labour in the agricultural sector significantly determines migration from Egypt (-3%), Ghana (-3%), Botswana (-4%), Kenya (-2%), Malawi (-6%) as well as Mauritius (-4%), Seychelles (-11%). Furthermore, migration continued to rise to countries with reduced employment in the service sector for Kenya and Malawi at three per cent each and Mauritius (-7%). The service sector at the destination country was not a strong predictor of migrant stock from the rest of Africa.

The theoretical framework had relaxed the assumption of homogeneity in the agricultural sector as inconsistent with Africa to global north labour market conditions. The model assumed constant returns to scale in the agricultural sector, yet it is notable that we cannot assume away wage and market condition differentials between OECD countries and Africa despite comparatively lower profit margins in the agricultural sector. Therefore, the results show that part of the traditional sector employment decline in the OECD was replaced by African migrants. Agricultural sector employment has statistical and economic significance on migration from at least half of the African countries in model 2, yet migration was rising by three per cent (Egypt, Ghana) to eleven per cent (Seychelles), in spite of declining opportunities in the sector. Except in the case of Egypt which is significant at ten per cent level of confidence, all other countries are at most $\alpha = 0.05$ in both models.

Indeed, the presence of these badly-behaved variables suggests a need to test the more specific non-linear relationship. At the same time, the industry sector affects migration from Morocco (-3%) negatively, but none of the other African countries shows statistically significant relationships with this sector. Crozet (2004), also observed that local employment in the manufacturing sector was not a significant predictor of market attraction

in Europe. In our study, as also suggested in Crozet (2004) this may be a challenge with manufacture sector data construction over time. The linear model was, however, not ignorable because it permitted a systematic cataloguing of the characteristics of destination countries that determined migration clusters, modelled as migration to any particular destination as a fraction of all migration from that country. Krugman contributes to the discussion on which push factor is dominant by setting the direction of migration to the pull of manufactures, even though the absence of manufactures at source is implicit rather than expressed.

The wage potential variable combined wages and employment as important centripetal forces for migrants. This wage potential conforms to the theoretical prediction that regions with closer proximity to consumer markets have lower transaction costs and better income, and in conjunction with employment predicts the degree to which migrants are attracted to these potential returns in their decision to migrate. Accordingly, the home market effect of the new economic geography theory applies when firms have higher access to markets and can make better incomes, so that nominal wages are higher (Coniglio, 2004). The direction of change that we find is statistically significant for Botswana (7%) and Ghana (4%) in Model 2, at $\alpha$= 0.05. This entails that migrants from these countries tend to go to locations with combined higher wage and employment rates and a rise in wages is associated with up to seven per cent increase in migration. The wage potential also showed spatial association for the two countries; Botswana and Ghana, for which distance was also not a significant deterrent of migration. This thesis conforms to studies which report that high market access regions attract workers (Brakman, Garretsen and Schram, 2002; Paillacar and Hering, 2008; Kurekova, 2011, Hering and Paillacar, 2016).

This thesis could not examine migrant distribution by skill levels due to missing data for the period of interest (for instance, the Docquier and Marfouk database by level of skills stops in 2000), but notes the findings of Hering and Paillacar (2016) using a similar new economic geography model. Hering and Paillacar (2016) reveal that sensitivity to market access is lower for workers with higher levels of education, suggesting that educated workers are more sensitive to amenities. This combined with network effects explain persistent destination choices of some African migrants even in the face of better economic opportunities elsewhere, for instance, in Scandinavian countries. Our assumption is

predicated upon Krugman's conceptualisation of migrants as those ones who take advantage of market opportunities through the position their human capital affords them. Indeed, it is industrial labour that is theoretically highly mobile and workers migrate with firms to a particular location (Krugman, 1991). This characterisation of migrants who take advantage of market access fit conceptually with the findings of Redding and Schott (2003) who show that since remoteness from the core erodes the skill premium, and firms who used skilled worker force would locate in the core, then migrants will follow to where market access is high.

Kurekova (2011) noted that while wage differentials were statistically significant determinants of migration in simple linear models, using ordinary least squares, once country effects were added the statistical significance disappeared. Similar to our study, networks were important country specific distinctions in the Kurekova (2011) panel on Eastern to Western European migration. While there is a spatial migration structure from Africa to the global north, these results in the thesis confirm that in the linear form it is driven by wage differentials in a few countries (Botswana and Ghana).

The lower significance of wages in other cases conforms to Kurekova (2011) as well as Hering and Paillacar (2016) and draws attention to the emerging literature indicating non-linearity in wage impacts (Crozet, 2004; Kurekova, 2011). Moreover, Herring and Paillacar (2016) argue that the non-significant wages could mean that migrants are drawn alternatively to stability and career opportunities than to actual wages. The model in this thesis covers the effect of career opportunities since the wage potential variable that is adopted also takes account of employment opportunities. Therefore, the debatable relationship for African countries with non-statistically significant wage potential informs our solution, predicated on Crozet's (2004), to estimate a non-linear form model.

Gravity models have shown consistency in explaining migration patterns and the results of this thesis, conform with the prognosis that proximity positively affects migration costs and through this channel migration flows (for example in Brakman *et al*, 2002; Tranos *et al*, 2012). This magnitude of impact of the wage potential increases with average distance to the global north. African migrants from Botswana with average distance from the considered destinations (9,602 $km^2$) relatively farther than Ghana (5,832 $km^2$) required a

stronger increase in wage potential reflected in the larger magnitude of impact of the explanatory variable. That the economic significance of wage potential improved in the second model suggests that in the presence of more restrictive policy, wages may become a stronger indicator of migrants' destination choice.

The thesis interprets networks combined the framework of Castells (1996) where social organisation and shared information reduces migration costs, with Krugman (1991) centripetal forces where forward linkages can encourage more migration. The network variable reflects cultural proximity using the ability to speak the same language, which also comes as a consequence of colonial ties, and interacted with remittances it reflects the presence of [African] nationals abroad. All African countries have a sizeable diaspora in the OECD-5, so the importance of networks found is expected. In the cases of Morocco, Botswana, South Africa, Kenya, Malawi and Mauritius, networks are statistically significant determinants of migrant distributions, in both models. Among the wide array of African countries that had strong networks in the OECD-5 were those with less immigration diversity, such as Malawi, which has been shown earlier in the data exploration section, remained in the OECD-5.

The model specification matters as networks become statistically significant in the presence of the policy variable in all cases except Egypt. This means that when policies become more restrictive, destinations with already established networks are more favourable to Ghanaian (2%) and Nigerian (4%) migrants. The level of confidence for Nigeria is at $p \leq 0.10$, in all other cases, it is at most five per cent.

Since these networks represent post-colonial and language ties, they fit within the accepted literature on migration patterns (Tranos *et al*, 2012; McKenzie and Rapoport, 2007) and specifically for African migrant distribution (see Adepoju and van der Wiel, 2010). However, the magnitude of impact is marginal in some cases at less than one per cent for Morocco, Botswana, Kenya, Malawi, Ghana and Mauritius, suggesting that in recent decades the strength of networks as traditionally measured is declining.

In other words, colony and language ties as well as remittances continue to help predict migrant destinations while African migrants continue to form new connections to destinations with previously fewer connections. The conceptualisation of networks within

a market framework fits within Mabogunje (1970) type explanations of expansion of these networks. Migration network theories have been criticised for a circular logic in their prediction that migration continues infinitely to the same destinations without explaining the structures that might break these patterns, and this model suggests that new markets perpetuated emerging networks.

The network effect is stronger for Egypt (2%), Nigeria (4%), South Africa (7%) and Seychelles (6%) when we consider jointly the two scenarios of liner representations where one model accounts for policy effects. Among these countries with relatively strong networks, Nigeria and South Africa are emigration diverse, while at the same time, the predominance of their migration still remains within accustomed destinations. The relative strength of the network effects in Nigeria and South Africa, in the presence of networks instrumented with remittances, further reflects their rank as top remittance receiving countries in Africa according to data from the World Bank (2018). Moreover, the volume of migration from South Africa and Nigeria to the entire global north sample makes them unique in representing both the presence of existing networks and the formation of new connections. In the case of Seychelles and Egypt, the magnitude of impact should be interpreted as a reflection of their persistent return to previously common destinations, which are in the OECD-5.

The implication of these networks is interesting since they mean that African migrants under the right market conditions will disperse to new locations. This raised positive opportunities towards reducing proportion of African migrants going to a particular destination, where such direction is of interest to destination or source countries. In the converse sense, it implies that African migrants were responsive to incentives to move to new destinations. Unfortunately, most of the existing studies on Africa were robust in country historical evidence approaches, which do not report magnitude of impact numerically. Consequently, a comparison of magnitude of impact between existing studies and this thesis was not plausible. The thesis notes that historical ties remain significant in determining migrant destinations in recent decades; however, in many cases, networks as measured traditionally in African migration literature are no longer strongly economically significant. For example, as observed in Tranos *et al* (2012) languages such as English are more widely spoken than in the 1980s as a result of globalisation. The importance of colonial ties remained while its

impact was increasing in Tranos *et al* (2012) who compared all immigrants going to the OECD. This comparison of presence or absence of colonial networks does not arise for our sample of only African countries, so that the results reveal that African distribution of migrants over time is less dependent on colonial ties.

The impact of distance is significant at $\alpha$= 0.05, in both models for Morocco (-3% each), Kenya (less than one per cent each), Malawi (-11%, and -9%), Mauritius (-4% and -7%) and in the case of Seychelles only in model 2 at three per cent. In all statistically significant cases, the direction of change is inverse, as predicted by gravity theory, migration declines for farther locations. The theoretical implication is that at high transport costs globally the world will be made of peasant farmers, however since the distance variable is particularly significant for Africa, rather than core-periphery equilibriums that emerge firms should move to serve Africa from location (see Krugman, 1991). Consequently, assuming that such capital mobility is impactful, our model indicates that symmetric equilibrium will emerge.

There is supporting empirical evidence for other continents on the importance of distance in migratory patterns given that farther distances are generally associated with higher migration costs (Hering and Paillacar, 2016; Garcia *et al*, 2014; Tsegai and Quang, 2010). Although Hering and Paillacar (2016) suggest that the negative impact of distance reduces with level of education, data on educational attainment was not available to verify this in the thesis.

In the case of Seychelles, while the fixed effects methodology was parsimonious, we still need to consider with caution the magnitude of significance of the distance variable in which the unit of measurement, did not vary over time (see Mummulo and Peterson, 2017). We observe that counterfactuals such as already existing diaspora of Seychelles nationals in the United States could reflect in within-unit variations of the distance variable, through reduced transportations costs that are associated with networks. People from Seychelles could find moving to farther destinations relatively easier when they already have networks there. This reflects in the important migration volumes to the United States relative to other closer destinations for Seychelles (see Table 4.2). Nonetheless, we note that the magnitude of significance is not far-fetched from those observed in the other countries for which the random effects was parsimonious. This is peculiar only to Seychelles given the estimation

technique. We conclude that, over time destinations with three per cent higher transportation costs are associated with one per cent less migration from Seychelles.

In the two models, distance is not representative of migration patterns from Southern Africa (Botswana and South Africa) and Western Africa (Ghana and Nigeria). These latter two countries (Ghana and Nigeria) are also part of the more emigration disperse among the Africa-10 sample size. However, unlike Morocco, which is predictably emigration disperse to much of Europe, given relative proximity; Nigerian and Ghanaian migrants are spread across the OECD-10, including significant proportions in relatively more distant US and Canada (featured in appendix 9).

The magnitude of impact of distance varies with the lowest impact of less than one per cent for Northern Africa, which is comparably closer to Europe, and highest at eleven per cent for Malawi. Interestingly, economic significance of distance is not comparable among African geographical regions. Migrants from Egypt (-11%) travel relatively farther distances than their Moroccan (-3%) counterparts; for Southern Africa and the Seychelles, distance is not significant and the contradictory direction of impact suggests recent migration dispersion for South Africa.

The discussion of policy impacts in this thesis falls within Krugman's frame of thought that barriers to mobility are centrifugal forces deterring further migration. Overall, in 60 per cent of the cases, restrictive policy of the destination country negatively affected migration from Africa, but only in half of these cases did we find policy statistically significant. The data excluded refugees and asylum seekers as well as undocumented migrants from the sample in order to streamline the analysis to reflect the impact of those policies directed at labour migrants rather than other migrant population types. The direction of the relationships for migration policy costs showed statistically significant results that restrictive policy targeted at specific [documented, voluntary] migrant reduced migration from Kenya (-0.8%), Seychelles (3%) and for Ghana between one per cent for lower categories of restrictions (PI and PII) and three per cent for the highest category of restrictions (PIII). In the case of Ghana, all of the categories of policy restrictiveness show a statistically significant relationship with migration and at more frequent policy interventions migrations decreased further.

The model specification for Ghana was distinctly better in the case where the impact of policy was included (Model 2). In the other three cases, for Botswana, Egypt and Nigeria, the direction of impact from policy restrictions was negative on migration as predicted by theory; however, not statistically significant. Interestingly, those countries where the policy measure was statistically significant for a restricted target sample were not significantly affected on a larger target sample and the converse applied. This reflects that migrant populations in each African country respond distinctly to type of policy intervention and also suggests that migrant populations differ significantly even among selected countries in which migration had not been driven historically by asylum seekers and refugees or other non-labour migrants.

The results are explainable within the findings of Mountford and Rapoport (2014) whose work shows policy openness significantly impacts on migration from Africa, and more specifically within the works of Russek (2009) who show that restriction on market access kept destination markets artificially small, reducing migration. Adepoju (2006) and Flahaux (2014) apposite to our findings reported that restrictive policies of former colonies drove migration from Africa downwards. However, given the simulation and qualitative approaches used in the mentioned studies, the magnitude of impact when reported in other studies was circumstantial and could not be compared with ours.

In the case of Seychelles an increase of degree of restrictiveness increased migration by three per cent, however at more frequent policy interventions this was resolved and migration declined by three per cent. The first finding reporting direct relationship between migration and policy restrictiveness reflects intertemporal substitution bias (see De Haas, 2011) where migrant stock tends to rise with more restrictive policy changes. Intertemporal substitution effect implies that migrants who would otherwise be mobile view restrictive policy as a signal that once they leave, they cannot return. Moreover, seeking best practices, as is the replication of the Canadian point system and its derivatives targeting selected immigrants across developed economies may frustrate migrants search raising the value of remaining where they are (de Haas, 2011). The thesis argues that inter-temporal substation effects are intensified by policy coordination among developed countries such as when migration policies mirror each other for example in the cases of Canada and US until 1970s (also see Martin 2013).

How policy affects the influx of migrants remains unresolved in the overall literature (Martin, 2003; Russel 2009; Czaika and Parsons, 2017). Czaika and Parsons (2017) found that skill selecting and skill targeting policies such as the point-based system influenced the flow of highly skilled migrants, while the overall effect on all migrant populations was uncertain. The thesis finds similar uncertainty in generalising, for all of Africa, the effects of migrant populations not disaggregated by skill levels, while able to confirm that more restrictive policy deters migration from Ghana, Kenya and Seychelles.

The negative relationship between migration policy and migrant stock in Ghana may be partly observed in the brisk shift in migration from Ghana to the United Kingdom following policy restrictions at the latter. A similar shift for Nigeria in response to restrictive policy was not captured in the migration variable. Furthermore, the measurement of the category three (PIII) policy changes had more interventions which could have driven the significance. Russel (2009) interprets that the effectiveness of migration policies depends on the level on trade costs. This could explain the lower significance in Nigeria where networks appeared to significantly support migration costs.

The results provide overall explanation of migration flows showing that destination country markets size, networks, distance, and restrictive policy affect African migration patterns. However, as predicted by Krugman (1991) for destinations distant from the centre, these patterns are not associated with core-periphery patterns. The NEG relies on destination country productivity, so essentially this thesis proceeds to test the relatedness of destination market size, concentration and productivity and migration costs in non-linear form in order to explain African migration patterns.

**Table 4.5: Gravity model estimates on the impacts of markets and migration costs on migration to OECD-10, 1990, 2000, 2010 and 2017**

| Dependent variable: $Migration_{ij}$/ Sum $Migration_{ij}$ | Fixed Effects Technique | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | Egypt | | South Africa | | Nigeria | | Seychelles | |
| | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 |
| C | -1.438*** (0.639) | -1.712** (0.733) | 0.623 (0.683) | 1.969 (1.169) | -1.217 (2,443) | -1.305 (1.320) | -1.298 (1.825) | -0.036 (1.822) |
| Agric (z) | -0.015 (0.019) | -0.035* (0.018) | 0.033 (0.020) | 0.028 (0.029) | -0.129 (0.073) | -0.001 (0.033) | -0.077 (0.054) | -0.117** (0.046) |
| Industry (x) | -0.004 (0.005) | -0.006 (0.003) | 0.002 (0.005) | 0.004 (0.005) | 0.009 (0.019) | -0.002 (0.06) | 0.001 (0.014) | 0.002 (0.008) |
| Services (y) | -0.020 (0.024) | -0.041 (0.020) | 0.035 (0.026) | 0.027 (0.031) | -0.076 (0.114) | -0.012 (0.38) | -0.066 (0.070) | 0.007 (0.049) |
| Wage potential (probw) | -0.020 (0.029) | -0.012 (0.028) | 0.047 (0.031) | 0.026 (0.046) | 0.027 (0.77) | -0.007 (0.051) | -0.035 (0.085) | -0.125 (0.071) |
| Population ($s_j$) | 0.112** (0.047) | 0.146*** (0.048) | -0.108 (0.051) | -0.171** (0.077) | 0.217 (0.183) | 0.083 (0.087) | 0.162 (0.136) | 0.112 (0.120) |
| Transport costs (δ) | -0.003 (0.004) | -0.005 (0.005) | 0.005 (0.005) | 0.010 (0.009) | -0.011 (0.018) | 0.002 (0.010) | -0.010 (0.014) | -0.034** (0.014) |
| Network (n) | 0.021** (0.010) | 0.003 (0.010) | 0.063*** (0.011) | 0.072* (0.016) | 0.015 (0.041) | 0.037* (0.019) | -0.004 (0.030) | 0.061** (0.026) |
| Restrictive policy (PI) | | -0.003 (0.004) | | 0.002 (0.007) | | -0.009 (0.008) | | 0.031** (0.011) |
| Restrictive policy (PII) | | -0.001 (0.005) | | 0.002 (0.08) | | -0.003 (0.009) | | -0.007 (0.013) |
| Restrictive policy (PIII) | | -0.004 (0.006) | | -0.008 (-0.010) | | -0.006 (0.011) | | -0.036** (0.015) |
| F | 3.94 | 3.16 | 9.56 | 5.26 | 0.97 | 3.34 | 0.66 | 2.46 |
| Prob> F | 0.005 | 0.042 | 0.000 | 0.007 | 0.477 | 0.035 | 0.706 | 0.086 |
| F (9, 23) | 8.78 | 11.79 | 16.02 | 7.81 | | 3.37 | 0.47 | 3.18 |
| Prob > F | 0.000 | 0.000 | 0.000 | 0.001 | 0.708 | 0.036 | 0.882 | 0.043 |
| $R^2$ overall | 0.643 | 0.572 | 0.508 | 0.480 | 0.69 | 0.605 | 0.114 | 0.622 |
| AIC | -274.826 | -187.461 | -269.538 | -169.305 | -167.629 | -156.923 | -190.954 | -174.526 |
| BIC | -261.315 | -172.048 | -256.027 | -153.891 | -154.118 | -141.509 | -177.443 | -159.113 |
| Hausman $Chi^2$ | | 30.97 | | 29.53 | | 35.04 | | 46.14 |
| Prob>$Chi^2$ | | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| Obs | 40 | 30 | 40 | 30 | 40 | 30 | 40 | 30 |

***, **, *: significant at 1, 5 and 10 per cent, standard errors are in parenthesis

Source: Authors' Computation

| Dependent variable: $Migration_{ij}$/ Sum $Migration_{ij}$ | Random Effects Technique | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| | Morocco | | Botswana | | Kenya | | Malawi | |
| | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 |
| **C** | 0.525 | 0.511 | -0.455 | -1.725* | 0.006 | 0.193 | 0.312 | -0.176 |
| | (0.572) | (0.659) | (0.957) | (0.976) | (0.405) | (0.328) | (0.985) | (1.150) |
| **Agric (z)** | -0.012 | -0.013 | -0.029 | -0.042** | -0.024** | -0.029*** | -0.063*** | -0.063*** |
| | (0.012) | (0.015) | (0.018) | (0.018) | (0.008) | (0.009) | (0.018) | (0.24) |
| **Industry (x)** | -0.030* | -0.022** | -0.007 | -0.009 | -0.007 | -0.006 | -0.019 | -0.015 |
| | (0.010) | (0.010) | (0.012) | (0.012) | (0.006) | (0.004) | (0.015) | (0.17) |
| **Services (y)** | 0.041 | 0.036 | -0.047 | -0.074 | -0.038 | -0.034* | -0.075 | -0.088* |
| | (0.039) | (0.042) | (0.012) | (0.052) | (0.026) | (0.019) | (0.064) | (0.069) |
| **Wage potential (probw)** | -0.019 | -0.016 | 0.049 | 0.070** | 0.020 | 0.010 | -0.048 | -0.024 |
| | (0.022) | (0.025) | (0.032) | (0.031) | (0.014) | (0.011) | (0.038) | (0.044) |
| **Population ($s_j$)** | -0.005 | -0.009 | 0.080 | 0.118* | 0.066** | 0.063* | 0.145** | 0.154*** |
| | (0.046) | (0.051) | (0.062) | (0.064) | (0.030) | (0.023) | (0.074) | (0.082) |
| **Distance (δ)** | -0.035*** | -0.031*** | -0.085 | -0.003 | -0.090* | -0.094*** | -0.109** | -0.097*** |
| | (0.007) | (0.008) | (0.056) | (0.047) | (0.013) | (0.014) | (0.024) | (0.034) |
| **Network (n)** | 0.004** | 0.005*** | 0.006*** | 0.004*** | 0.009*** | 0.009*** | 0.006*** | 0.005*** |
| | (0.004) | (0.001) | (0.002) | (0.001) | (0.000) | (0.000) | (0.001) | (0.002) |
| **Restrictive policy (PI)** | | 0.013 | | -0.005 | | -0.003 | | 0.004 |
| | | (0.010) | | (0.011) | | (0.004) | | (0.015) |
| **Restrictive policy (PII)** | | 0.004 | | -0.018 | | -0.008* | | 0.008 |
| | | (0.012) | | (0.014) | | (0.05) | | (0.021) |
| **Restrictive policy (PIII)** | | 0.016 | | -0.022 | | -0.004 | | -0.020 |
| | | (0.017) | | (0.020) | | (0.007) | | (0.027) |
| **Wald ($Chi^2$, 7)** | 58.24 | 36.47 | 29.25 | 43.87 | 64.87 | 424.26 | 22.11 | 46.24 |
| **Prob $Chi^2$** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.022 | 0.000 |
| **$R^2$ overall** | 0.645 | 0.657 | 0.638 | 0.697 | 0.887 | 0.957 | 0.686 | 0.708 |
| **AIC** | | -145.871 | | -130.658 | -228.298 | -191.061 | -154.261 | -121.589 |
| **BIC** | | -130.458 | | -115.245 | -214.787 | -175.647 | -140.750 | -106.176 |
| **Hausman $Chi^2$** | | 5.50 | | 3.52 | | 7.11 | | 7.42 |
| **Prob>$Chi^2$** | | 0.78 | | 0.94 | | 0.525 | | 0.59 |
| **Obs** | 40 | 30 | 40 | 30 | 40 | 30 | 40 | 30 |

***, **, *: significant at 1, 5 and 10 per cent, standard errors are in parenthesis

Source: Author's computation

| Dependent variable: Migration$_{ij}$/Sum Migration$_{ij}$ | Random Effects Technique | | | |
|---|---|---|---|---|
| | 17 | 18 | 19 | 20 |
| | Ghana | | Mauritius | |
| | Model 1 | Model 2 | Model 1 | Model 2 |
| C | -1.129 (0.809) | -1.310*** (0.466) | -0.394 (0.719) | -0.574 (0.543) |
| Agric (z) | -0.023 (0.015) | -0.033*** (0.009) | -0.036** (0.016) | -0.040*** (0.011) |
| Industry (x) | -0.007 (0.013) | -0.009 (0.007) | -0.008 (0.010) | -0.011 (0.009) |
| Services (y) | -0.038 (0.053) | -0.047 (0.028) | -0.051 (0.042) | -0.077*** (0.032) |
| Wage potential (probw) | 0.031 (0.030) | 0.047*** (0.017) | 0.007 (0.029) | 0.028 (0.021) |
| Population ($s_j$) | 0.074 (0.062) | 0.087*** (0.034) | 0.090** (0.051) | 0.118*** (0.039) |
| Distance (δ) | 0.011 (0.024) | -0.004 (0.015) | -0.048 (0.038) | -0.078*** (0.022) |
| Network (n) | 0.074 (0.001) | 0.002*** (0.000) | 0.005*** (0.002) | 0.006*** (0.001) |
| Restrictive policy (PI) | | -0.012** (0.006) | | 0.003 (0.008) |
| Restrictive policy (PII) | | -0.013* (0.008) | | 0.017 (0.011) |
| Restrictive policy (PIII) | | -0.032* (0.011) | | 0.003 (0.013) |
| Wald (Chi$^2$, 7) | 16.79 | 73.11 | 21.95 | 77.65 |
| Prob Chi$^2$ | 0.018 | 0.000 | 0.008 | 0.000 |
| $R^2$ overall | 0.344 | 0.793 | 0.610 | 0.803 |
| AIC | -168.984 | -178.226 | -188.314 | -155.695 |
| BIC | -155.473 | -162.812 | -174.803 | -140.282 |
| Hausman Chi$^2$ | | 3.07 | | 15.29 |
| Prob>Chi$^2$ | | 0.96 | | 0.053 |
| Obs | 40 | 30 | 40 | 30 |

***, **, *: significant at 1, 5 and 10 per cent, standard errors are in parenthesis

**Source:** Author's computations

**Location specific effects on migrant distribution from Africa**

Having observed a clustering of migrants from Africa at OECD-5 destinations and a gradual dispersal to OECD-N destinations; the thesis proceeds to examine what could account for location specific disparities by extending our examination of observed characteristics of those destinations using a non-linear model. The non-linear model has the additional advantage of capturing cumulative effects that forward linkages have on migrant distributions. The results of location specific effects on migrant distribution from Africa are presented in Table 4.6.

The initial estimation under the default assumption regarding the number of iterations and derivatives (changes) to compute[36] did not converge to consistent values among all parameters for all countries. Crozet (2004) observed that it was not possible to predict both mu and sigma given that mu was not independently attached to any variable and applied a calibrated model with fixed values for mu. A similar calibration was tested for this research but only marginally improved overall predictiveness of the model (F statistics). Moreover, calibration was inconclusive in resolving convergence challenges overall in the countries, thus was not reported.

In order to determine which of the parameters could not be estimated concomitantly, two techniques of iterative optimisation were used to re-estimate the model, ensuring that the derivatives specification controlled for redundancy. An initial scenario used unconstrained parameters to determine those parameters that were statistically not different from zero and the alternative approach reported in Table 4.6, constrained those parameters, these are delta and sigma. This solution further helped to more accurately determine the effect of other regressors. The Akaike and Bayesian information criterion were used to select among the

[36] The delta (4e-7) default assumption was relaxed variously in country specific estimations. The delta (#) according to specifies the relative change in a parameter, delta, to be used in computing the numeric derivatives. The specification was optimised to control for redundancy among parameters. The specifications by country are Egypt, South Africa, Botswana, Ghana, Nigeria, Mauritius, Seychelles, and Malawi (4e-10); Morocco (4e-9), and Kenya (4e-8).

results of the three scenarios.[37] The scenario presented subsequently (Table 4.6) was most representative among the three with the exception of Northern Africa (Egypt and Morocco), which were marginally enhanced in the alternative forms reported in the appendix. A more balanced panel was preferred given the decennial data, so the scenario excluding the final period of 2017 was used.

The theoretical argument that the thesis models following Crozet (2004) is that the degree of agglomeration is a function of centripetal and dispersing forces. Implicitly, when there exists high enough trade and transactional cost for which it becomes unprofitable to import manufactures, a symmetric equilibrium rather than core-periphery patterns will persist. In Krugman and Venables (1995, 1996) the argument is slightly different in that the relocation of a firm draws intermediate goods, rather than industrial labour, which is immobile. In the Krugman and Venables (1995) interpretation, labour intensive industries may locate in regions with abundant labour as is the case for capital. Therefore, our results should fit among the footloose entrepreneur type findings where both destination and source markets remain in symmetric equilibria as a result of dispersing forces. However, Robert-Nicoud (2005) affirm that the symmetric steady state is only stable when transportation costs are significant enough, with this in mind the thesis can discuss the stability of this equilibrium.

Notably, Robert-Nicoud (2005) through mathematical resolutions of all the varieties of NEG models, whether core-periphery or footloose entrepreneur specifications, show that all are isomorphic, so that describing the properties of one type of the model is enough to understand the stability of the other. This non-linear model further to determining the equilibria-type, explains the direction of impact of sector employment on migrant distribution, which had been unresolved in the linear specification.

As expected in all models of agglomeration forces and specifically conforming with Crozet (2004) the results show a strong positive association between migration and service sector employment. We pay attention to the Coniglio (2002) observation that the spatial equilibrium differs for skilled workers: because while sufficiently high transportation costs inhibit the agglomeration of firms, human capital can respond distinctly. The spillover

[37] The scenario of missing convergence for some countries is reported in Appendix 17 and the scenario with unconstrained parameters is reported in Appendix 18.

effects of skill agglomeration and the associated productivity can lead to high returns to migration and foster location specific skill clustering. This manifests in our model through service sector migration from Africa, but inconclusively since the thesis did not control for skill levels.

Similar to Crozet (2004) the elasticity of substitution between inputs took account of the traditional sectors (x, z) in relation to service sectors (y), which provided more robust results for south-north migration.[38] In nine out of ten cases, service sector employment was a statistically significant determinant of African migrant destination choices; raising migration to a certain destination by between one per cent (Egypt) and seven per cent (Malawi). Predictably, because of relatively lower economic integration among continent than within continents this was a much smaller magnitude than reported within Europe (0.43 and 0.97) in Crozet (2004). The results reflect that African migrants are responsive to market access and tend to concentrate spatially and in the case of Eastern Africa (Kenya and Malawi) and Seychelles, these require relatively stronger markets to induce increases in migration.

In addition, the thesis adopts the convention of Hering and Paillacar (2016) in controlling partially for the price mechanism using nominal wages. In this case the impact that remains to be observed is the attraction that better job opportunities bring, by interacting nominal wages with employment as used in Crozet (2004). This wage potential variable represents earnings subject to a probability of employment (Crozet, 2004, Massey 2005). The wage potential, that is employment opportunities interacted with nominal wages,[39] were significant predictors of African migrants' destination choices in the cases of Nigeria (2%), Ghana (4%), Egypt (4%) and Mauritius (-6%). Apart from the case of Nigeria with a 10 per cent level of confidence all impacts were significant at five per cent.

Coniglio (2002) remarked that in spite of increased regional migration as a result of integration, when the volume of migration remains small, the market effects can be expected to be marginal as observed in our results. Moreover, according to Coniglio (2002) at certain

[38] The alternative specification combining manufactures and agriculture is reported in Appendix 21.

[39] While it is expected that real wages are more representative, Fujita et al (1999) argue that in the case that expenditure for manufactured goods is high in a given region, high real wages can reflect either high nominal wages or low price index, therefore the preferred variable is nominal wages

transactional costs only high skilled workers have the incentive to migrate. While this thesis could not test directly for skilled migration, for lack of recent data, it is noted that of the four countries with significant market access, three of them, Ghana, Mauritius, and Nigeria had significant relatively high skilled migration rates of 45 per cent, 55 per cent and 10.1 per cent respectively as at 2000 (see OECD database of Docquier and Marfouk, 2007).

In Helpman type models, wages are higher in regions that are either part of or within proximity of a larger market and personal incomes are valid approximations for market size (see Brakman, Garretsen, and Schram, 2002; Hering and Paillacar, 2016). Destinations with better wage potentials attracted between two per cent and four per cent more African migrants, specifically from Ghana and Egypt. This magnitude is further significant because three of those source economies (except Mauritius) have relatively high overall migration volumes. Migrants from Mauritius, which is an exceptional case, are concentrated in France and the United Kingdom, with relatively lower wages than United States and Germany, for instance. This is reflected in the negative relationship between wages and migrant distribution. Brakman *et al,* 2002 describe unique equilibrium conditions that result from Helpman type models; that is, while Krugman's model predicts stable core-periphery equilibrium or pure agglomeration, Helpman type models show that for high trade costs there will be symmetric equilibrium. Moreover, where there are high transfers, for example remittances, the wages potential is expected to decline (Brakman *et al*, 2002). However, the association between remittances and wage potential could not be explored specifically in the thesis, given the focus on understanding networks and the interaction of remittances to form a network proxy.

The size of the destination country market interacted with delta, lambda, and beta variously and also affected convergence of the model. The solution was to use surface area to represent market size, which varies across countries but is constant within each destination. Consequently, it was only statistically significant for three countries, Egypt, Morocco, and Mauritius; with negligible economic impact. Moreover, the economic impacts for Morocco and Mauritius were negative conforming with predictions of dispersion away from agglomerated areas, in other words *market crowding effects*.

The various conceptualised migration costs raised a question on how the thesis should assign a parameter to measure migration costs cumulatively. One way to include policy would have been to interact it with the network parameter. Given that the network in this study is already represented by an interacted variable and the policy is generated in binary form, after dichotomising categories of frequent restrictive policy interventions, it was methodologically challenging to further interact the two costs. Nonetheless, a composition of all network costs was tested, however, the policy variable interacted with the network variable did not return more significant results than when specified separately.

Hence, policy effects were tested twofold. In one instance policy replaced networks in the model, since only one of the two could be modelled at once. This also resolved the challenges arising from the opposite direction of impact exhibited by networks which have a positive effect on migration and restrictive policy, which is inversely related [to migration]. The model did not accommodate the specification of policy interacted with networks because each policy category had to be estimated separately as the policy model distinguishes between more restrictive policy based on frequency of interventions. In other to test for robustness, migration costs were estimated in two separate forms including a control form without policy effects. The estimation using policy effects helped to avoid compounding the number of missing parameters.

The Fujita et al (1999) frame demonstrates that labour immobility including through policy costs deter agglomeration. The thesis results show that policy was a statistically significant predictor of migrant distribution only from Nigeria (-1%) at ten per cent level of significance; and specifically, category “II” policy changes, or increased frequencies of more restrictive state interventions deterred migration. In other words, migration tends to rise with more frequent restrictive policy changes represented by category “II” policy but once there were above five of such interventions, they seized to be significant. In the absence of existing model specifications to capture the theoretical *market crowding effect*, it can be conceptually inferred that more restrictive policy could reflect some of the government concerns with increasing living costs associated with agglomeration.

The results of the thesis are consistent with concerns raised by Clemens *et al* (2018) and de Haas (2011) around the effectiveness of destination country policy in deterring migration.

Category II type restrictive policy interventions also increased migration from Mauritius by two per cent, against theoretical predictions, suggesting that migration rises in Mauritius in spite of more restrictive interventions. These weak effects of more restrictive policy on migrant spatial distribution imply that symmetric equilibrium will remain unstable as long as market attraction factors remain strong enough to reduce the centrifugal impacts (see Robert-Nicoud, 2005).

This stage of analytical framework further verifies if any of the variable effects detected in the linear model are cumulative. In the estimation of equation 11, five parameters are generated, three of which interact with migration costs (β, δ, λ) and two with market potential (μ,σ). Theory predicts that demand [backward] linkages are stronger when labour is skilled and consumers including migrants can spend more of their income on commodities (see Robert-Nicoud, 2005). In addition to these, supply side [forward] linkages lower costs of living at the destination so that the larger the share of expenditure spent on commodities (μ) the lower the elasticity of substitution among varieties (σ). The model in this thesis follows Crozet (2004) so that migration decisions are based on current nominal wages, a market pull effects and forward linkages are captured in the market potential parameters. The market potential parameters (μ,σ) capture the effects of location specific productivity. Sigma (σ) measures elasticity of substitution between [sector specific] labour inputs.

Technical limitations meant that the specification reported in Table 4.6 constrains the values of delta and sigma, because at a first stage of analysis they had been tested to be statistically not different from zero. Mu (μ), which measures the share of consumers expenditure on commodities, signifies market potential. Mu was statistically significant in eight of the ten cases and expectably had values of between 3% and 8% similar to the regional results of Crozet at four and six per cent (2004). However, in Crozet the values were assumed rather than estimated so a discussion of the strength of regional market potential against the pull from more remote Africa is difficult. The findings confirm that a stronger market potential is required to drive African migrant distributions but that where it exists African migrants' redistribution is strong. The magnitude of impact of this market potential (mu) ranges between less than one per cent (Egypt) and six percent (Malawi) with the most frequent values being at three per cent (Botswana, South Africa) and four per cent (Kenya and Seychelles). This reflects that African migrants respond to market conditions, particularly

employment in services and in the case of Egypt the wage potential. The market potential is however too weak to result in core-periphery patterns. Core-periphery pattern formation would require a significant proportion of African migrants as a ration of all migrants from each country to be directed towards any certain global north destination.

The parameters sigma, delta and labour in services (a1) all define the constant elasticity of substitution price effect; of these labour supplies in services impacts significantly on African migrants' destination choices. Markets play a more significant role than migration costs for location-specific African migrant distribution. The market potential does not however account for migration from Ghana and Mauritius. Furthermore, exceptionally, Morocco showed negative but significant market attraction. The case of Morocco reflects migration patterns that have been more low-cost driven and do not shown market potential, in other words since migrants from Morocco can access a variety of OECD-10 destinations, their choice is driven more by geographical proximity so that we do not find evidence of clustering at locations based on market access.

Observably, for Africa, inhibiting forces ordinarily encourage the development of simultaneous equilibria at source and destination countries, and we find footloose entrepreneur type solutions. These are interpreted similar to Crozet (2004) who describes these as 'not strong enough to show core-periphery patterns'. How do we then interpret more precisely our thesis results that show evidence that market forces are attractive enough to encourage concentration of African migrants at destination with favourable market access?

It is the case for Egypt (0.8%), Botswana (3%), South Africa (3%), Kenya (4%), Malawi (6%), Nigeria (2%) and Seychelles (4%) that market potential encourages agglomeration of migrants at the OECD-10. Following Robert-Nicoud's (2005) observation that one type of equilibria always prevails, should the thesis interpret that these patterns exhibit evidence of spatial clustering? It is also to be noted that the interpretation says nothing of the stability of such equilibria. The results must then be read with caution since in the ordinary sense agglomeration suggest that activities in the service sector have moved out of Africa and become spatially located in the OECD-10, rather, what the thesis finds is significant clustering of African migrants at destinations with market access. It remains unclear, due to

a lack of data to disaggregate by skill sets, whether these also reflect that heterogenous skill sets are arising between the industrial core and Africa. The thesis only confirms that agglomerating forces remain strong indicators of African migration patterns despite the presence of dispersing forces.

Networks (β) in a spatial context specified by interactions with distance (δ), returned statistically significant and buttressed the results of the linear model, however, the magnitude of impact in the non-linear specification became negligible. The network variable is robust across specifications, but the economic magnitude is marginal. In all cases except for the Islands, the direction of impact was positive as observed in other studies on African migration patterns (Adepoju and van der Wiel, 2010). Given that this research is possibly among the first to estimate cumulative effects of parameters on migration from Africa, the magnitude of impact could not be compared with other studies.

The variable measuring distance, which ordinarily interacts with beta and lambda, is both geographical distance and OPEC oil prices that complement geographical distance as a measure of transportation costs. The two indicators, geographical distance and OPEC oil prices were not statistically different from zero in the structural form; hence, the distance variable (delta) was constrained in Table 4.6. Migration costs (λ) were therefore cumulatively not significant except for Egypt and Morocco at one per cent degree of freedom. This is interpreted to mean missing forward linkages associated with distance costs.

In the case of Egypt, a unit decline in migration costs reduced migration by one per cent. However, for Morocco, migration rose by three per cent in spite of migration costs. This implies that the Helpman model predictions remain accurate, despite irresolute about what constitutes migration costs for Africa. In other words, distance does significantly capture migration costs for Morocco. The results confirm that in recent decades, which represent the time frame covered by the thesis, market potential has become an increasingly important indicator of African migrant distribution.

**Table 4.6: Helpman non-linear model estimates on the spatial effects of markets and migration costs on migrant distributions, periodic evidence from 1990, 2000 and 2010**

| **Dependent variable: $Migration_{ij}$/Sum $Migration_{ij}$** | | **Northern Africa** | | **Southern Africa** | | **Eastern Africa** | | **Western Africa** | | **Islands** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Egypt** | **Morocco** | **Botswana** | **South Africa** | **Kenya** | **Malawi** | **Ghana** | **Nigeria** | **Mauritius** | **Seychelles** |
| | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| Destination country (j) market conditions | Labour employment services ($a_1$) | 0.012*** (0.003) | -0.025*** (0.009) | 0.036* (0.020) | 0.040** (0.019) | 0.046*** (0.016) | 0.077** (0.034) | -0.005 (0.024) | 0.026** (0.010) | 0.019* (0.011) | 0.053* (0.018) |
| | Wage potential ($probw_{jt}$) $a_2$ | 0.042*** (0.007) | -0.093 (0.022) | 0.051 (0.030) | 0.015 (0.031) | -0.022 (0.022) | 0.007 0.041 | 0.044** (0.021) | 0.022* (0.012) | -0.062* (0.031) | 0.042 (0.031) |
| | Population ($S_j$) $a_3$ | - | - | - | - | - | - | 0.038 (0.033) | 0.001 (0.001) | - | - |
| | Size (Sj) $a_3$ | 0.006*** (0.001) | -0.006*** (0.003) | 0.003 (0.004) | -0.000 (0.003) | -0.003 (0.003) | -0.009 (0.007) | - | - | -0.005* (0.003) | -0.001 (0.004) |
| Migration costs | Policy category I ($a_5$) | 0.004 (0.003) | 0.014 (0.009) | 0.004 (0.010) | 0.005 (0.010) | 0.011 (0.012) | 0.021 (0.019) | -0.001 (0.005) | 0.001 (0.007) | 0.029* (0.013) | 0.018 (0.011) |
| | Policy category II ($a_6$) | -0.003 (0.004) | 0.017 (0.012) | -0.013 (0.011) | -0.000 (0.010) | 0.003 (0.013) | 0.002 (0.024) | -0.002 (0.004) | -0.010* (0.006) | 0.024* (0.013) | 0.003 (0.016) |
| | Policy category III ($a_7$) | 0.001 (0.006) | 0.027 (0.018) | -0.007 (0.016) | 0.017 (0.025) | 0.021 (0.029) | -0.021 (0.026) | -0.020 (0.013) | 0.004 (0.014) | 0.028 (0.020) | -0.011 (0.018) |
| | Migration cost ($\lambda$) | 0.010*** (0.002) | -0.037*** (0.009) | 0.011 (0.010) | 0.003 (0.00) | 0.006 (0.008) | 0.007 (0.009) | 0.004 (0.004) | 0.007 (0.006) | -0.013 (0.01) | 0.008 (0.007) |
| | Network ($\beta$) | 0.000*** (0.000 | - | 0.000*** (0.000) | 0.000 (0.000) | 0.000*** (0.000) | 0.000 (0.000) | 0.000*** (0.000) | 0.000** (0.000) | -0.000 (0.000) | -0.000 (0.000) |
| Parameter of market potential (CES) | Mu | 0.008** (0.003) | -0.044*** (0.010) | 0.032* (0.017) | 0.034*** (0.016) | 0.039*** (0.015) | 0.060** (0.030) | 0.028 (0.014) | 0.020** (0.009) | 0.006 (0.013) | 0.040** (0.016) |
| | Trend ($a_4$) | -0.062*** (0.010) | 0.056* (0.029) | -0.042 (0.046) | 0.007 (0.045) | 0.072* (0.038) | 0.054 (0.077) | -0.074 (0.048) | -0.015 (.016) | 0.079*** (0.030) | -0.023 (0.051) |
| **$R^2$** | | 0.948 | 0.595 | 0.589 | 0.517 | 0.601 | 0.485 | 0.777 | 0.784 | 0.475 | 0.585 |
| **Adjusted $R^2$** | | 0.925 | 0.441 | 0.433 | 0.333 | 0.449 | 0.253 | 0.692 | 0.702 | 0.275 | 0.399 |
| **RMSE** | | 0.006 | 0.020 | 0.026 | 0.024 | 0.024 | 0.041 | 0.012 | 0.014 | 0.024 | 0.024 |
| **AIC** | | -203.043 | -132.646 | -129.041 | -131.125 | -130.171 | -103.06 | -175.848 | -162.090 | -129.389 | -133.442 |
| **BIC** | | -190.433 | -118.634 | -116.431 | -118.514 | -117.561 | -90.452 | -163.237 | -149.639 | -116.779 | -120.832 |
| **Obs** | | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |

**Source:** Author's computation

***, **, *: significant at 1, 5 and 10 per cent, standard errors are in parenthesis

# CHAPTER FIVE

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Summary

This thesis examined the influence of markets characterised by economies of scale as well as the role of migration costs in the form of barriers to mobility namely: distance, and restrictive policy, on migrant distributions from ten African countries to ten global north destinations. It contends that markets with increasing returns to scale, reflected in wage and employment productivity, exhibit spatial effects and migration costs inhibit African migrants, affecting their destination choices.

The framework posits that labour redistribution would persist towards stronger markets, because of increasing returns to scale that characterise those destinations but that for Africa, the costs of migration are significant barriers to mobility. Transportation costs remain contravening forces while this research conceptualises additional centrifugal effects based on more restrictive destination country policy changes. It therefore tests whether labour migration from Africa can lead to cumulative spatial concentration of economic activities. An understanding of such spatial patterns is crucial to projecting what drives relatively high volumes of African migrants at certain destination. The forward linkages that imply cumulative spatial concentration are important to projecting whether certain activities, particularly in the service sector, risk becoming unavailable within the continent.

The thesis proceeded from a footloose entrepreneur solution to Krugman's (1991) theory where dispersion forces, particularly transportation costs, are strong enough to lead to

simultaneous market equilibria at source and destination countries of migrants. It tests empirically the determinants of spatial distribution of African migrants in ten OECD countries and concludes that location specific characteristics such as market size and [market] concentration at the destination are strong drivers of spatial clustering of African migrants. It submits that unless dispersing forces of distance and policy costs remain strong, we can expect the simultaneous market equilibria condition to be unstable in describing Africa to OCED migrant distribution. Implicitly, when transaction costs are not low enough between Africa and the OECD-10 for location factors to exhibit hysteresis, or self-sustaining agglomeration, yet destination market forces are attractive enough, it will be associated with larger African migrant clusters.

Through a gravity model as well as a non-linear representation arising from Helpman, this thesis captures destination market effects characterised by productivity, and the extent to which migration costs interact with these to determine African migrants' distribution patterns. The correlation between unique errors and endogenous regressors are determined through a Hausman model specification test and the choice between fixed or random effects is specific to each African country. Several scenarios of the model were tested, and the Akaike and Bayesian information criterion applied post estimation, to choose among alternative model specifications. The thesis applies the mixed effects technique because of its strength in controlling for omitted variable bias to estimate the effects of a panel of ten destination country markets on each African country.

The gravity model showed that destination country market conditions, in particular the wage potentials in the global north increased migration from Africa. The impact of wage potentials is between four per cent (for Ghana) and seven per cent (for Botswana); it is positively associated with average distance from the industrial core. This implies that African migrants went to destinations with returns to labour as well as improved employment opportunities.

While destinations with networks have higher migrants, its contribution to migration since the 1990s is in modal values about one per cent; except for the case of South Africa and Seychelles, where existing connections with the destination country, captured by colonial ties and remittances, raised migration by up to six per cent. This means that the impact of

colonial and language ties may be waning as migrants continue to find emerging destinations that offer them the economic opportunities that they seek. In conjunction with the positive impact of market attractions on migration, the results show that employment and wage conditions are becoming more economically significant determinants in the spatial settlement of African migrants.

The model also showed that barriers to mobility, specifically distance, remain a significant obstacle to migration, by a magnitude of between three (for Egypt and Morocco) and eleven per cent (for Malawi) reflecting the association between regional proximity and ease of transportation. In other words, migration volumes were affected by distance between origin and destination country, with more migrants remaining within geographical proximity. The results show that natural barriers to migration significantly affect African migrants' destination choices, and the proportion of people who can move in response to market attraction remains small in magnitude.

Another factor deterring agglomeration was restrictive policy, but only in a few cases, by magnitudes of up to three per cent. Implicitly, where migration was much less than the model would predict, such as the decline from Ghana to previously common destinations such as the United Kingdom, the impact of more restrictive policy was visible albeit it cannot be excluded that other dispersing forces also affected the migrant proportions.

The Helpman model capturing cumulative location specific effects of markets was more representative of the predictions of the NEG theory. Its extension to Africa affirms the NEG framework on the redistribution of migrants in the face of contravening forces. At the same time, the market potential showed significant influence on African migrants' destination choices in spite of contravening forces. The market potential is significant at $\alpha = 0.05$ for all African countries, except Ghana and Mauritius; and in the case of Botswana at ten per cent level of confidence. The wage potential drives migration from Egypt, Ghana as well as Nigeria. Labour in service sector drives migration for most African countries at $\alpha = 0.05$, but for Botswana and Mauritius at $\alpha = 0.10$. Nonetheless, fears about redistribution of African migrants in response to market incentives are not justified since the volume of migration cannot be judged as critical in magnitude and agglomeration effects do not

indicate core-periphery patterns. Furthermore, the attraction of networks in recent decades is smaller in magnitude.

## 5.2 Conclusion

This thesis situated African migrant distribution in the global north within symmetric equilibria conditions of the New Economic Geography framework, which demonstrates that market attraction forces are constrained by mobility costs. It tests the extent to which African migrant distribution is impacted by destination country economic conditions, particularly those that reflect economies of scale. The research covers spatial migration patterns between ten African countries of origin modelled individually, and a panel of ten destinations in the global north, using mixed effects techniques.

The more recent methodological advances in modelling African migration patterns stopped at accounting for where African migrants are concentrated. The panel distribution of ten destination countries used in this thesis allows a comparison of market centrifugal and centripetal forces at various destinations to explain where African migrants are likely to go based on location specific characteristics. The dependent variable uses the share of migrants going to any destination among a panel of OECD-10 receiving countries as a fraction of all migrants from each Africa-10 country. The use of non-linear modelling to explain the determinants of African migrant concentrations in locations contributes to the literature on centrality in migration patterns; otherwise, capturing the opportunity costs of migrants faced with alterative destination choices.

The findings confirm the presence of home market effects or demand side linkages in spatial distribution of African migrants. Specifically, the determinants that recur in more than half of the countries include the size of destination economy, sectoral labour employment particularly in services, distance, and the presence of networks. The findings show that African migrants, particularly those from Egypt, Botswana, Kenya, Malawi, Ghana, and Mauritius put a premium on the market size when making migration decisions. Destination markets with higher population have between five (Egypt) and fifteen (Malawi) per cent influence on African migrants' destination decisions. Smaller countries such as Botswana, Malawi and Mauritius also tend to be comparatively attracted to larger destinations.

In all cases, wages interacted with employment opportunities remain the most significant determinant of African migrant destination choices. In the cases of Egypt and Mauritius, only a one per cent rise in wages at the destination is required to increase migration by one per cent, but the values are higher for Nigeria (2.6%), Botswana (3.6%), South Africa (4%), Kenya (4.6%), Seychelles (5.3%) and Malawi (7.7%).

In the cumulative spatial distribution model, employment opportunities, which are exogenous in the service sector, drove migration from most of Africa, with the highest magnitudes of impact at seven per cent. In addition, wage potentials inform migrants' decision to move from Nigeria, Ghana; and Seychelles by between two and four per cent. This impact suggests imperfect market information about destination country conditions in African migrant decision making. The research also demonstrated that networks had positive effects on migration from Africa, but the traditional specifications of networks only marginally impacted upon African migrant distribution in the recent decades.

The results confirm the theoretical predictions that when labour mobility is restricted, through barriers to mobility such as distance, or in a few cases the presence of stricter policy, these impede geographical concentrations of African migrants. The effects of distance were particularly strong for Kenya, Malawi, Morocco, Seychelles, and Mauritius, so that transportation costs were significant deterrents of migration from these locations to the OECD. Increase in policy restrictiveness deterred migration from Kenya, Seychelles, and Ghana.

The results show little regional consistency in what determines the distribution of African migrants. Migration from Egypt is significantly different in comparison to Morocco as is migration from Eastern Africa countries and so forth for the rest of the regions. This resulting evidence implies that each country's specific characteristics are important in the distribution of migrants from Africa to the global north.

## 5.3 Recommendations

Larger market size is an important predictor of migrant destination choice; however, there are indications of imperfect market information: for instance, African migration does not decline with opportunities in the agricultural sector and employment opportunities inform

migration decisions in only three cases. The results confirm that migrant location choices have opportunity costs and source and destination interventions can be aimed at helping migrants choose maximally between desirable alternatives. This strengthens the case for studies that have been recommending the need for source and destination countries to cooperate in improving labour market information available to migrants, in order to facilitate a better match between destination needs and migrant choices. In the agricultural sector, policies that will improve upon imperfect market information should be put in place. Tools towards improving labour market efficiency between source and destination, such as information centres at point of departure can be tested towards achieving better labour demand and supply matches than currently obtainable.

The marginal role that networks of African migrants at various destinations play in determining the distribution of migrants is positive. African migrants would tend to go to previously popular destinations where the influx of migrants has been high. Yet, the economic significance suggests that African migrants are dispersing towards new destinations and have a potential to continue to do so under the right conditions. It indicates that migrants would respond to initiatives that help them to settle at previously less popular destinations where networks had previously been strong.

This research takes note of global policy drives towards promoting regular channels of migration and discouraging the use of alternative pathways. Policy coordination can include multilateral arrangements where destinations with relatively fewer migrants, and labour market gaps would be able to offer comparatively higher migration incentives; the converse holds. However, because of the skewed effect of deterrent forces on different countries, these initiatives should appeal to a wide range of potential migrants, paying attention to the factors affecting individual source economies reported in this thesis. Noticeably, policy choices and generally migration management can benefit from improved data on Africa.

The conclusion that African migrant destination choices are country and region-specific means that recommendations regarding African migrants should distinguish between its countries. Observably, destination country employment and wage conditions have centripetal attractions for African migrants, particularly for Nigeria and Egypt. Natural barriers to mobility remain significant deterrents to migration between Africa and the global

north and more restrictive policy reduces migration from Nigeria. A case in point is that distance is a more significant deterrent of migration from Eastern Africa. Incentives to migrate towards less agglomerated countries or the converse disincentives to migrate away from strong markets must take account of how migration costs affect the mobility of African migrants by country of origin.

## 5.4 Limitations of the Study

Migration distribution is a complex phenomenon that include especial importance selection by level of skill, particularly in the case of Africa where financial and education capabilities determine who can migrate internationally. There is a gap to be filled in the spatial distribution of African migrants by levels of income, gender, and skill, which this thesis could not undertake given sparse data. Furthermore, African migration distribution to other destinations outside the OECD is changing in magnitude; however, the available data for those destinations is less consistent over time than that of the OECD, this limits the geographical scope covered. In addition, migration costs also refer to how migrants finance their departures, but again due to lack of data, such cost and its implication for which income class migrates was not undertaken.

Finally, but not less significantly, the thesis excludes the ethics of migration; even though the author is aware of the possibility of violations of ethical considerations, for instance, in migrant selection criteria or related to the loss of highly skilled human capital from countries that need the skills most. Indeed, the thesis infers that positive self-selection in the market as well as destination country selection criteria can lead to unequal distribution of labour across continents. However, the theoretical framework merely suggests that markets and migration costs would lead to a redistribution of labour but does not discuss the consequences of such a reallocation.

Notwithstanding these limitations, the theoretical depiction remains accurate in explaining African migration patterns, and the results contribute to the literature on concentration of migrants. This thesis is also relevant to other studies that may wish to extend the literature as well as to policy directed at maximising migrant distribution.

## 5.5 Contribution to Knowledge

The novelty of the thesis is that it extends the New Economic Geography theory to account for migrant distributions from more distant locations in the presence of migration costs such as geographical distance and restrictive policy that are a reality for African migration. Although there has been a growing body of research explaining spatial patterns of migration as a result of attraction and dispersion forces, this thesis applies recent developments in the data and methodology of migration to explain African migrant configurations. Specifically, it estimates the attraction of wages as a key determinant of migration by reflecting destination country productivity in these wages through a model that captures increasing returns to scale. The research is also unique in systematically modelling the impacts of migration costs on African migrant distribution within a core-periphery framework that accounts for both market attraction and migration costs, measuring policy impact is a particular contribution. No other known study has tested the core-periphery equilibrium predictions of the NEG for Africa.

The thesis is unique in testing an agglomeration model in the case of migration from Africa to the global north, which provides insights on how supply side linkages contribute to clustering of African migrants by destination. It discusses patterns of migration in a spatial context by accounting for productivity and interactions between destination country characteristics and migration costs. It further derives a measurable impact of destination country restrictive policy interventions on African migration patterns.

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**Appendix 1: Emerging destinations by stock of African migrants, 1970 to 2010**

| Country of Origin | Country of Destination | 1970 | 1980 | 1990 | 2000 | 2010 | Distance in km [Source to destination] |
|---|---|---|---|---|---|---|---|
| Cameroon | | 0 | 0 | 0 | 662 | 1752 | 5430 |
| Cape Verde | | 714 | 1770 | 4343 | 5206 | 11467 | 4848 |
| Congo, Dem. Rep. | | 122 | 310 | 785 | 3025 | 3515 | 6377 |
| Ethiopia | | 435 | 1115 | 2853 | 4150 | 8144 | 5706 |
| Ghana | | 659 | 1662 | 4173 | 5618 | 12123 | 5230 |
| Guinea | | 0 | 0 | 0 | 1657 | 2191 | 5056 |
| Liberia | | 0 | 0 | 0 | 1365 | 2127 | 5338 |
| Rwanda | | 0 | 0 | 0 | 662 | 1120 | 6487 |
| Sierra Leone | | 0 | 0 | 0 | 2689 | 4659 | 5152 |
| Sudan | | 0 | 0 | 0 | 4253 | 4662 | 4759 |
| Tanzania | | 0 | 0 | 0 | 562 | 1449 | 7344 |
| Togo | | 0 | 0 | 0 | 676 | 1100 | 5155 |
| Zimbabwe | Netherlands | 0 | 0 | 0 | 507 | 1202 | 8223 |
| Eritrea | Norway | 18 | 45 | 181 | 504 | 1030 | 5627 |
| Gambia, The | | 22 | 118 | 453 | 538 | 1283 | 5635 |
| Angola | | 0 | 0 | 1429 | 1045 | 4646 | 5745 |
| Cameroon | | 0 | 0 | 149 | 763 | 5517 | 4343 |
| Cape Verde | | 0 | 0 | 381 | 723 | 4841 | 3415 |
| Equatorial Guinea | | 0 | 0 | 40 | 4287 | 24829 | 4538 |
| Gambia, The | | 0 | 0 | 41 | 3600 | 18112 | 3253 |
| Ghana | | 0 | 0 | 255 | 2148 | 14684 | 3894 |
| Guinea | | 0 | 0 | 141 | 2147 | 12657 | 3577 |
| Guinea-Bissau | | 0 | 0 | 42 | 1518 | 7462 | 3385 |
| Liberia | | 0 | 0 | 13 | 583 | 1074 | 3875 |
| Nigeria | | 0 | 0 | 256 | 4734 | 38775 | 3844 |
| Senegal | | 0 | 0 | 405 | 7416 | 51672 | 3160 |
| Sierra Leone | | 0 | 0 | 56 | 616 | 1286 | 3675 |
| South Africa | Spain | 0 | 0 | 1144 | 542 | 2602 | 8577 |
| Congo, Dem. Rep. | | 18 | 41 | 74 | 550 | 1486 | 7082 |
| Gambia, The | | 3 | 7 | 11 | 1466 | 3358 | 5847 |
| Ghana | | 16 | 37 | 68 | 567 | 1441 | 6300 |
| Somalia | | 9 | 61 | 49 | 6807 | 17948 | 6795 |
| Uganda | Sweden | 20 | 45 | 82 | 1174 | 2975 | 6688 |

Source: Author's compilation from World Bank, Global Matrixes of Bilateral Migration stock (GBMB), 2018

**Appendix 2: Emerging destination by spread of migrants to global north countries starting in the year 2000**

| Country of Origin | Country of Destination | 2000 | Remarks |
|---|---|---|---|
| Botswana | Austria | 10 | Origins with common historical roots |
| Malawi | Austria | 20 | |
| Namibia | Austria | 27 | |
| Botswana, Burkina Faso, Burundi, Cameroon, Liberia, Sierra Leone, Uganda | Bulgaria | 2 each | Diverse origins |
| Malawi | Czech Republic | 19 | Diverse origins |
| Rwanda | Czech Republic | 13 | |
| Togo | Czech Republic | 15 | |
| Botswana, Guinea-Bissau | Finland | 3 each | Diverse origins |
| Burkina Faso, Gabon | Finland | 1 each | |
| Central African Republic, Seychelles | Finland | 2 each | |
| Lesotho | Greece | 2 | Origins with common historical roots |
| Namibia | Greece | 5 | |
| Swaziland | Greece | 4 | |
| Ethiopia | Iceland | 31 | |
| Namibia | Iceland | 19 | |
| Sierra Leone | Iceland | 10 | |
| Botswana | Ireland | 117 | |
| Liberia | Ireland | 52 | |
| Rwanda | Ireland | 64 | |
| Angola | Japan | 45 | |
| Botswana | Japan | 13 | |

| | | | |
|---|---|---|---|
| Chad | Japan | 36 | |
| Nigeria | Latvia | 4 | Diverse Origins |
| South Africa | Latvia | 7 | |
| Zimbabwe | Latvia | 5 | |
| Lesotho | Macedonia, FYR | 1 | - |
| Liberia | Netherlands | 2021 | Low income countries of origin |
| Sierra Leone | Netherlands | 3393 | |
| Sudan | Netherlands | 5742 | |
| Benin, Chad, Mali, Niger | New Zealand | 6 each | Low income origins |
| Burkina Faso, Cape Verde, Mauritania, Togo | New Zealand | 3 each | |
| Burundi | Norway | 59 | Low income countries of origin |
| Niger | Norway | 6 | |
| Central African Republic, Gabon, Malawi, Niger, Swaziland | Poland | 1 each | Low income origin |
| Burkina Faso, Chad, Eritrea, | Serbia and Montenegro | 1 each | Low income origin |
| Central African Republic, Equatorial Guinea, Gabon, Gambia, Guinea-Bissau | Serbia and Montenegro | 2 each | |
| Botswana | Switzerland | 13 | Origins with common historical roots |
| Malawi | Switzerland | 29 | |
| Swaziland | Switzerland | 20 | |
| Cameroon, Rwanda | Turkey | 16 each | |
| Congo, Dem. Rep. | Turkey | 20 | |
| Uganda | Turkey | 19 | |

Source: Author's compilation from World Bank, Global Matrixes of Bilateral Migration stock (GBMB), 2018

*Note: The countries are those who had no migrants from the country of origin as at 1990. The top three countries of origin according to magnitude of migrants were selected for each new destination*

## Appendix 3: Market Factors in African countries

| Country of origin | Unemployment (%) | | Labour productivity growth (%) | | Economically active population | | Annual nominal minimum wages, USD | Consumer Price Indices | |
|---|---|---|---|---|---|---|---|---|---|
| Year | 1990 | 2014 | 1992 | 2013 | 2000 | 2013 | Latest period (2013-2015) | 1991 | 2014 |
| Angola | 6.94 | 6.79 | -9.33 | 1.91 | 4337000 | 6350000 | 1984 | 83.6 | 7.3 |
| Benin | 0.80 | 0.78 | -0.58 | 1.77 | 1384000 | 1643000 | 971 | - | -1.1 |
| Botswana | 19.93 | 18.89 | -1.33 | 3.46 | 281000 | 330000 | 735 | 11.8 | 4.4 |
| Burkina Faso | 2.65 | 3.01 | -2.85 | 3.12 | 4982000 | 7652000 | 841 | 2.2 | -0.2 |
| Burundi | - | - | - | - | 2754000 | 3891000 | | 9.0 | 4.4 |
| Cameroon | 5.45 | 4.20 | -6.47 | 1.74 | 3482000 | 3574000 | 880 | 0.1 | 1.9 |
| Cape Verde | - | - | - | - | 35000 | 31000 | 1588 | 9.6 | -0.2 |
| Central African Republic | 6.96 | 7.76 | -6.01 | -16.62 | 1189000 | 1286000 | 920 | -2.8 | 1.5 |
| Chad | 6.85 | 6.94 | 0.03 | 0.53 | 2418000 | 3065000 | 1456 | | |
| Comoros | - | - | - | - | 171000 | 240000 | 1780 | | 0.6 |
| Congo, Dem. Rep. | 6.75 | 6.48 | -0.70 | 3.29 | 11694000 | 14934000 | 471 | -1.7 | |
| Côte d'Ivoire | 5.76 | 3.91 | -3.05 | 5.22 | 2946000 | 2812000 | 888 | | 0.5 |
| Djibouti | - | - | - | - | 233000 | 303000 | | | 2.9 |
| Eritrea | 7.35 | 7.23 | 1.87 | -2.05 | 1090000 | 1680000 | | | |
| Ethiopia | 7.03 | 5.85 | -12.54 | 3.61 | 24049000 | 33869000 | | 35.7 | 7.4 |
| Gabon | 21.70 | 19.03 | -7.93 | 2.29 | 207000 | 187000 | 3641 | -11.7 | 4.7 |
| Gambia, The | - | - | - | - | 461000 | 658000 | 312 | 8.6 | 5.9 |
| Ghana | 21.7 | 4.9 | -1.86 | 5.59 | 4785000 | 6558000 | 632 | 18.0 | 15.5 |
| Guinea | 1.94 | 1.84 | -2.48 | -0.11 | 3320000 | 4092000 | | | 9.7 |
| Guinea-Bissau | 6.76 | 7.15 | -1.10 | - | 391000 | 471000 | 462 | 57.6 | -1.5 |
| Kenya | 10.13 | 9.17 | -4.41 | 2.49 | 10757000 | 14068000 | 662 | 20.1 | 6.9 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Lesotho | - | - | - | - | 348000 | 371000 | 1303 | 17.7 | 5.3 |
| Liberia | 3.86 | 3.71 | 1.50 | 5.17 | 712000 | 967000 | 446 | | |
| Madagascar | 2.95 | 3.50 | -1.77 | -0.49 | 5243000 | 7971000 | 556 | 8.6 | 6.1 |
| Malawi | - | - | - | - | 3907000 | 5390000 | 405 | 12.6 | 24.4 |
| Mali | 8.45 | 8.25 | -5.21 | 2.38 | 2376000 | 3277000 | 691 | 1.8 | 2.1 |
| Mauritania | 31.86 | 30.89 | -1.69 | 3.20 | 570000 | 801000 | 1202 | 5.6 | 3.5 |
| Mauritius | - | - | - | - | 63000 | 43000 | 1031 | 7.0 | 3.2 |
| Mozambique | 8.86 | 8.36 | -9.47 | 4.64 | 7092000 | 9250000 | 1149 | 32.0 | 2.6 |
| Namibia | 19.00 | 16.83 | 5.14 | 1.96 | 253000 | 272000 | | | 5.4 |
| Niger | 5.09 | 5.05 | -10.84 | 2.29 | 3099000 | 4677000 | 729 | -7.8 | -0.8 |
| Nigeria | 7.36 | 7.50 | -2.29 | 3.29 | 12443000 | 12314000 | 1326 | 13.0 | 8.1 |
| Rwanda | - | - | - | - | 3242000 | 4749000 | | 19.6 | 1.3 |
| Sao Tome and Principe | - | - | - | - | 28000 | 34000 | | | 6.4 |
| Senegal | 10.03 | 10.19 | -2.33 | 0.85 | 2929000 | 4165000 | 770 | -1.8 | -1.1 |
| Seychelles | - | - | - | - | 28000 | 30000 | 4357 | 2.0 | 1.4 |
| Sierra Leone | 3.38 | 3.05 | 9.40 | 10.68 | 1041000 | 1377000 | 1326 | - | 7.3 |
| Somalia | 6.95 | 6.93 | 11.15 | 0.06 | 2048000 | 2605000 | | | |
| South Africa | 21.00 | 24.82 | -7.07 | 0.79 | 1482000 | 1089000 | | 15.3 | 6.4 |
| Sudan | 15.34 | 15.35 | -7.07 | 1.77 | 6223000 | 7437000 | 889 | 123.6 | 36.9 |
| Swaziland | - | - | - | - | 148000 | 136000 | 694 | | |
| Tanzania | - | 3.61 | - | - | 13557000 | 18309000 | 290 | | |
| Togo | 7.14 | 6.88 | -6.29 | 2.63 | 1106000 | 1346000 | 849 | 0.4 | 0.2 |
| Uganda | 3.02 | 3.61 | -0.55 | 1.62 | 8420000 | 810000 | 28 | | 4.3 |
| Zambia | 18.9 | 13.35 | -0.31 | 2.73 | 2685000 | 11930000 | 1019 | 97.6 | 7.8 |
| Zimbabwe | 5.66 | 5.39 | -2.19 | -1.10 | 3269000 | 3483000 | | - | -0.2 |

Sources: International Labour Organisation: Global Employment Trends. Available at http://www.ilo.org/global/about-the-ilo/multimedia/maps-and-charts/WCMS_233936/lang--en/index.htm and World Bank Data Available at http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?page=4 and African Development Bank data Portal available at http://dataportal.afdb.org/DataAnalysis.aspx and United Nations

Notes: ILO motivates unemployment rates different from those in national sources as due to differences in coverage and/or definitions.

**Appendix 4. Sample of more restrictive policy changes at destination countries, by magnitude of restriction**

| United States | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Magnitude** | **Summary** | **Year** | **Description** | **Level of legislation** | **Policy area** | **Policy tool** | **Target group** |
| Major change | replaces the fixed cap of 270,000 with a flexible cap of 714.000. | 1991 | Immigration Act of November 29, 1990 (104 Statutes-at-Large 4978) comes into operation in October 1991 - replacing the fixed quota of 270.000 with a flexible quota of 714.000 and laying out three tracks for non-refugee settlement migration: a family track, an employment track and a track to allow people without US connections, but with some employable skills<br>> This Act was an attempt to revamp the legal immigration system and admit a greater share of highly-skilled and educated immigrants. | National policy | Legal entry and stay | Quota/ target | All migrants |
| Mid-level change | widening of the temporary low-skilled worker programme | 2004 | Save our Small and Seasonal Businesses Act (SOS) - significantly widened the programme by altering the manner in which H-2B visas for low-skilled temporary workers are counted. While the cap remains, H-2B workers who were admitted in any of the three fiscal years prior to their current application may be readmitted under the programme without counting against the current year's cap. | National policy | Legal entry and stay | Work visa/permit | Low-skilled workers |
| Minor change | Retains the priority on family migration with | 1991 | Immigration Act of November 29, 1990 (104 Statutes-at-Large 4978) comes into operation in October 1991 - attributed 465.000 of the overall 714.000 visas to family migration, with an additional 55,000 visas for spouses and children of IRCA | National policy | Legal entry and stay | Quota/ target | Family members |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | an important quota | | | | | | |
| Fine-tuning | more visas for high skilled | 2000 | American Competitiveness in the Twenty-First Century Act - to meet demand for skilled immigrants (especially in science, math, and engineering specialties) and enable employers to fill technology jobs, the Act raised the annual number of H-1B visas given to high-skilled workers in specialty occupations to 115,000 in 2000, then to 195,000 for 2001, 2002, and 2003, but mandated that the number of visas return back to its original 65,000 by 2004.<br>> Non-profit or government research organizations, institutions of higher education, and other non-profit entities were exempted from the visa caps altogether. | National policy | Legal entry and stay | Quota/ target | Skilled/ high-skilled workers |

Source: Determinants of International Migration (DEMIG) (IMI, 2015)

## Appendix 5: Specification of Networks

| | | DESTINATION COUNTRY | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOURCE REGION | SOURCE COUNTRY | Canada | France | Germany | UK | US | Spain | Netherlands | Norway | Sweden | Switzerland |
| SOUTHERN AFRICA | BOTSWANA | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| | SOUTH AFRICA | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| NORTHERN AFRICA | MOROCCO | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | EGYPT | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| WEST AFRICA | GHANA | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| | NIGERIA | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| EAST AFRICA | KENYA | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| | MALAWI | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| ISLANDS | SEYCHELLES | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | MAURITIUS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |

Source: generated from literature review on former colonies, common language and labour market agreements.

Key: one indicates presence of networks and zero otherwise

## Appendix 6. Destination Country Conditions

| Country | Year | Population | Size | Nominal wages | Employment in agriculture | Employment in services | Employment in manufacturing |
|---|---|---|---|---|---|---|---|
| Unit of measurement | | Units | Squared Kilometres | Average annual, USD | Thousands of people | Thousands of people | Thousands of people |
| Canada | 1990 | 27791000 | | 34321.93 | 550.51 | 9337.38 | 4014.30 |
| Canada | 2000 | 30769700 | | 38466.66 | 485.35 | 10950.58 | 6373.38 |
| Canada | 2010 | 34005274 | 9984670 | 44335.70 | 378.94 | 13239.26 | 6298.70 |
| Canada | 2017 | 36708083 | | 47621.84 | 344.89 | 14540.46 | 6665.18 |
| France | 1990 | 58512808 | | 32665.75 | 1178.25 | 14764.00 | 1719.01 |
| France | 2000 | 60912500 | | 36340.75 | 957.50 | 17658.35 | 1503.00 |
| France | 2010 | 65027507 | 640679 | 41547.57 | 744.53 | 19297.97 | 10961.45 |
| France | 2017 | 67118648 | | 43755.33 | 697.95 | 20746.57 | 10466.43 |
| Germany | 1990 | 79433029 | | 37967.40 | 1070.00 | 19649.07 | 15099.88 |
| Germany | 2000 | 82211508 | 357114 | 41873.14 | 959.40 | 23077.19 | 12198.93 |
| Germany | 2010 | 81776930 | | 42970.23 | 625.93 | 26611.72 | 20865.70 |
| Germany | 2017 | 82695000 | | 47585.31 | 531.98 | 29714.00 | 22186.50 |
| UK | 1990 | 57247586 | | 30750.35 | 477.00 | 18943.1 | 10100.00 |
| UK | 2000 | 58892514 | | 38110.36 | 401.78 | 20126.47 | 13380.10 |
| UK | 2010 | 62766365 | 242495 | 44520.53 | 351.58 | 23218.97 | 10634.83 |
| UK | 2017 | 66022273 | | 43731.54 | 368.30 | 25799.30 | 11051.15 |
| US | 1990 | 249623000 | | 44721.35 | 3223.42 | 86813.50 | 56857.50 |
| US | 2000 | 282162411 | | 52801.18 | 2463.50 | 104377.60 | 59624.58 |
| US | 2010 | 309338421 | 9525067 | 58054.38 | 2206.00 | 112969.50 | 47046.51 |
| US | 2017 | 325719178 | | 60558.36 | 2454.17 | 124034.70 | 52949.24 |
| Netherlands | 1990 | 14951510 | | 46463.93 | 235.00 | 5554 | 2413.00 |
| Netherlands | 2000 | 15925513 | | 47595.69 | 237.33 | 6051.23 | 3117.33 |
| Netherlands | 2010 | 16615394 | 41850 | 53023.00 | 232.63 | 6802.68 | 2591.43 |
| Netherlands | 2017 | 17132854 | | 52876.51 | 176.05 | 7146.33 | 2491.73 |
| Norway | 1990 | 4241473 | 323802 | 30303.44 | 128.00 | 945 | 932.00 |
| Norway | 2000 | 4490967 | | 36378.50 | 77.33 | 1685.88 | 929.88 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Norway | 2010 | 4889252 | | 47309.64 | 63.70 | 1944.80 | 908.73 |
| Norway | 2017 | 5282223 | | 51212.21 | 54.43 | 2077.73 | 937.10 |
| Spain | 1990 | 38867322 | | 34387.97 | 990.60 | 8939.8 | 6199.30 |
| Spain | 2000 | 40567864 | | 36327.47 | 964.63 | 9736.10 | 9446.33 |
| Spain | 2010 | 46576897 | 505992 | 40018.05 | 786.08 | 13636.60 | 8358.60 |
| Spain | 2017 | 46572028 | | 38507.49 | 819.50 | 14229.63 | 7297.38 |
| Sweden | 1990 | 8558835 | | 28150.09 | 149.3 | 2989.2 | 1649.50 |
| Sweden | 2000 | 8872109 | | 32983.99 | 121.7 | 3170.7 | 1646.70 |
| Sweden | 2010 | 9378126 | 450295 | 38600.59 | 94.80 | 3530.83 | 1745.15 |
| Sweden | 2017 | 10067744 | | 42392.76 | 91.45 | 4022.58 | 1757.25 |
| Switzerland | 1990 | 6715519 | | 49394.22 | 163.75 | 2551.45 | 1085.32 |
| Switzerland | 2000 | 7184250 | | 54405.28 | 193.42 | 2803.44 | 999.13 |
| Switzerland | 2010 | 7824909 | 41284 | 60400.20 | 138.90 | 3170.15 | 1758.50 |
| Switzerland | 2017 | 8466017 | | 62282.57 | 140.70 | 3567.63 | 1814.63 |
| Source: Author's computation from various sources | | World Bank, World Development Indicators | | OECD (2018), Employment by activity (indicator)<br>OECD (2018), Average annual nominal wages | | | |

**Appendix 7. Minimum geographical distance between source and destination capital cities, squared kilometers**

| Origin country across/ Destination country down | Botswana | South Africa | Egypt | Morocco | Kenya | Malawi | Ghana | Nigeria | Seychelles | Mauritius |
|---|---|---|---|---|---|---|---|---|---|---|
| Canada | 12759 | 13011 | 8864 | 5896 | 12116 | 14623 | 8498 | 8665 | 13480 | 14910 |
| France | 8356 | 8533 | 3177 | 1833 | 6392 | 10441 | 4787 | 4672 | 7805 | 9350 |
| Germany | 8544 | 8691 | 2853 | 2665 | 6291 | 9612 | 5365 | 5196 | 7441 | 9079 |
| UK | 8721 | 8897 | 3475 | 2074 | 6740 | 6571 | 5112 | 5009 | 8109 | 9677 |
| US | 12730 | 12989 | 9355 | 6187 | 12989 | 9571 | 8540 | 8744 | 13912 | 15205 |
| Netherlands | 8702 | 8868 | 3270 | 2304 | 6613 | 10203 | 5239 | 5112 | 7898 | 9497 |
| Norway | 9347 | 9493 | 3591 | 3166 | 7062 | 9771 | 6073 | 5928 | 8105 | 9778 |
| Spain | 7757 | 7958 | 3350 | 822 | 6137 | 11078 | 3908 | 3842 | 7808 | 9235 |
| Sweden | 9262 | 9394 | 3381 | 3417 | 6875 | 9352 | 6191 | 6020 | 7810 | 9539 |
| Switzerland | 8020 | 8187 | 2739 | 1880 | 5980 | 6293 | 4614 | 4183 | 7368 | 8986 |
| **Mean** | **9419** | **9602** | **4405** | **3024** | **7719** | **9751** | **5832** | **5737** | **8973** | **10525** |
| **Standard Deviation** | **1818** | **1851** | **2495** | **1749** | **2576** | **2320** | **1563** | **1702** | **2502** | **2402** |
| **Minimum** | **7757** | **7958** | **2739** | **822** | **5980** | **6293** | **3908** | **3842** | **7368** | **8986** |
| **Maximum** | **12759** | **13011** | **9355** | **6187** | **12989** | **14623** | **8540** | **8744** | **13912** | **15205** |

Sources: Author's compilation from Gleditsch, K.S. and Ward, M.D. (2001) database and common border, and distance from to online resources, 2018[40]

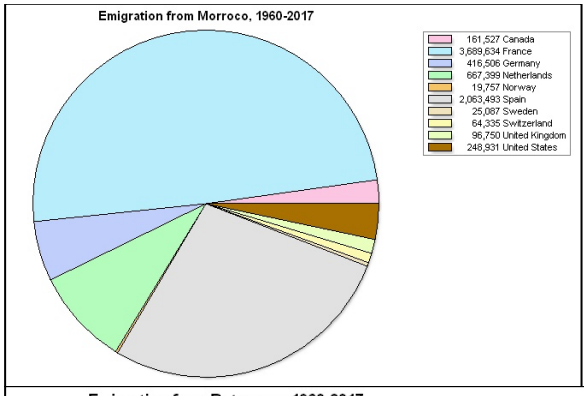
Available at http://ksgleditsch.com/data-3.html, and www.distancefromto.net

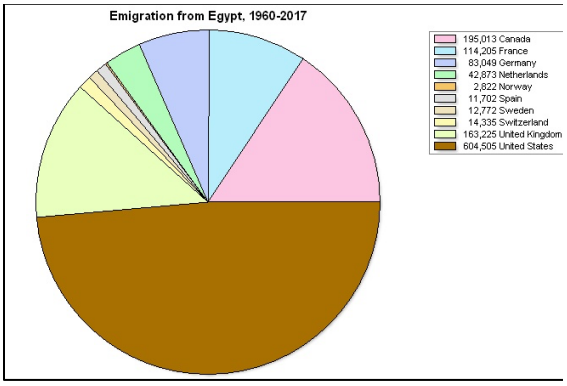
[40] The Gleditsch and Ward (2001) database does not cover all countries of interest especially emerging destinations

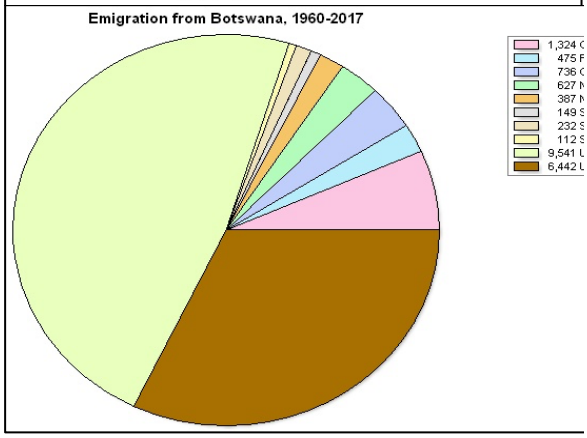
**Appendix 8: Summary of statistics on migration from country i, measured as number of persons 1960, 1970, 1980, 1990, 2000, 2010, 2017**

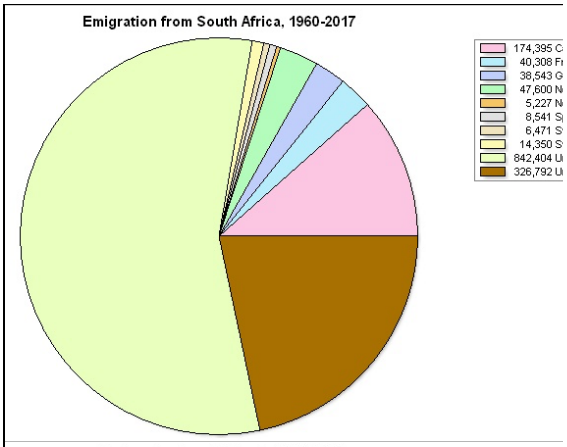
| Variable \| | Observations | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Egypt | 70 | 17778.57 | 31754.44 | 0.00 | 181677 |
| Morocco | 70 | 106477.4 | 214107.9 | 22.00 | 940552 |
| Botswana | 70 | 286.0651 | 641.8919 | 0.000 | 2880 |
| South Africa | 70 | 21494.75 | 0.036 | 0.000 | 245000 |
| Ghana | 70 | 13612.42 | 45587.96 | 0.000 | 171428 |
| Nigeria | 70 | 23607.44 | 54723.43 | 0.000 | 306874 |
| Malawi | 70 | 1210.276 | 3921.972 | 0.000 | 21000 |
| Kenya | 70 | 16895.85 | 37167.03 | 0.000 | 152999.2 |
| Mauritius | 70 | 5058.937 | 10695.58 | 0.000 | 45011 |
| Seychelles | 70 | 410.5686 | 823.2247 | 0.000 | 3847.846 |

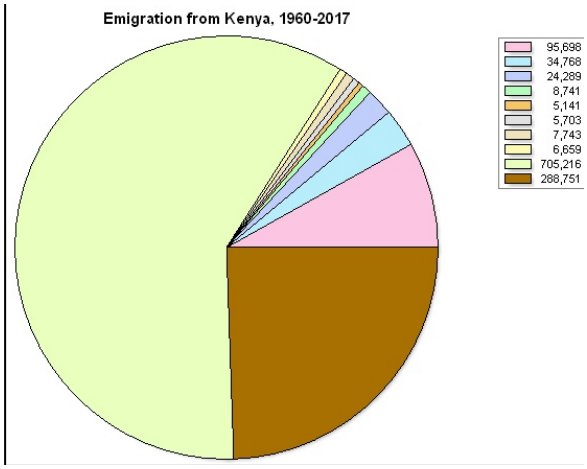
Source: Author's computation from Bilateral Estimates of Migrant Stock, 1960, 1970, 1980, 1990, 2000, 2010, 2017

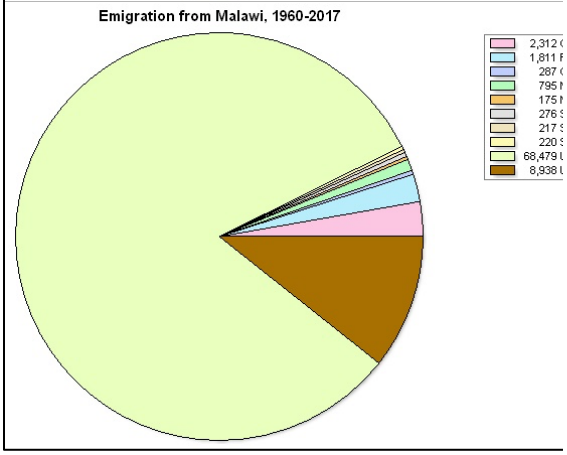

Emigration from Morroco, 1960-2017
161,527 Canada
3,689,634 France
416,506 Germany
667,399 Netherlands
19,757 Norway
2,063,493 Spain
25,087 Sweden
64,335 Switzerland
96,750 United Kingdom
248,931 United States

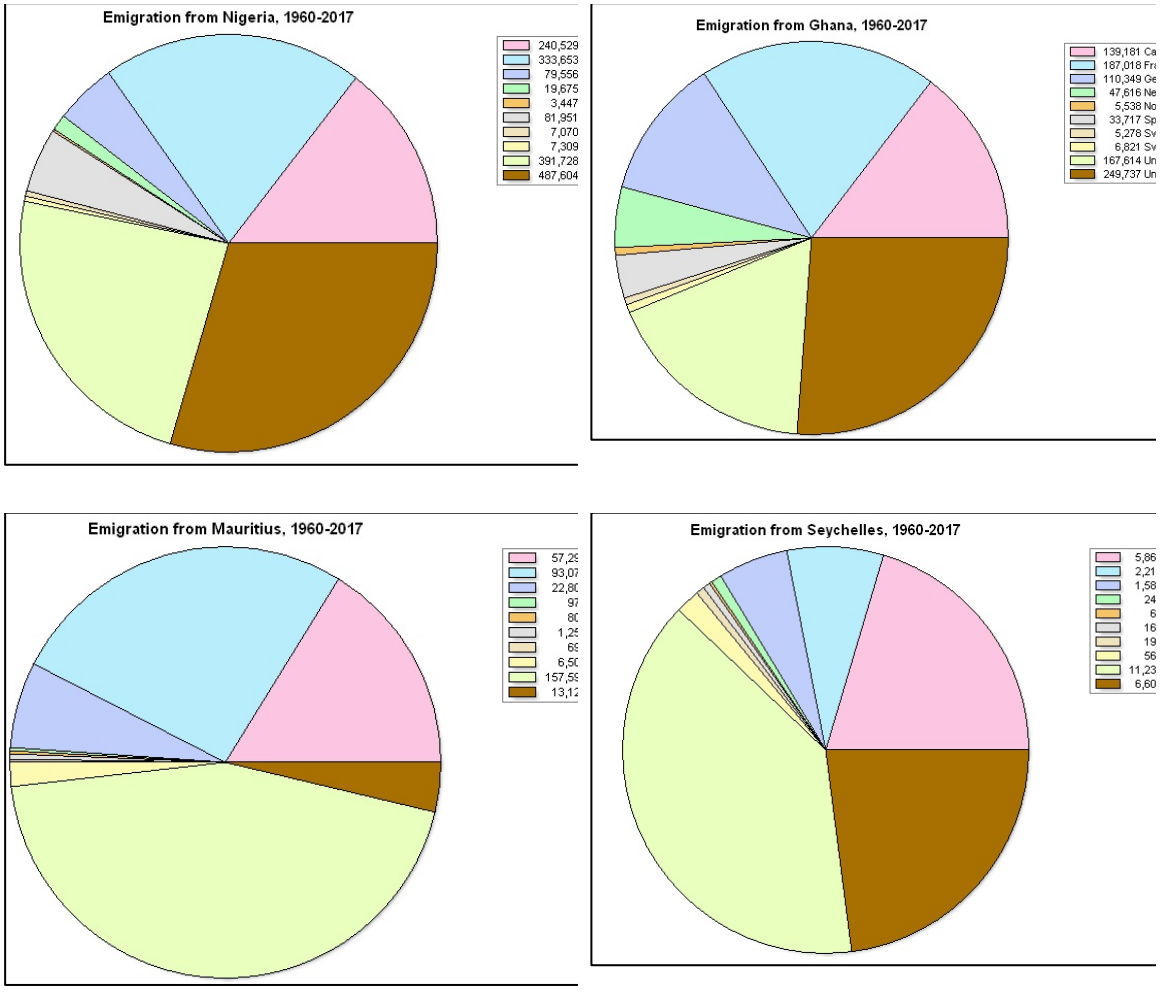

Emigration from Egypt, 1960-2017
195,013 Canada
114,205 France
83,049 Germany
42,873 Netherlands
2,822 Norway
11,702 Spain
12,772 Sweden
14,335 Switzerland
163,225 United Kingdom
604,505 United States


Emigration from Botswana, 1960-2017


Emigration from South Africa, 1960-2017

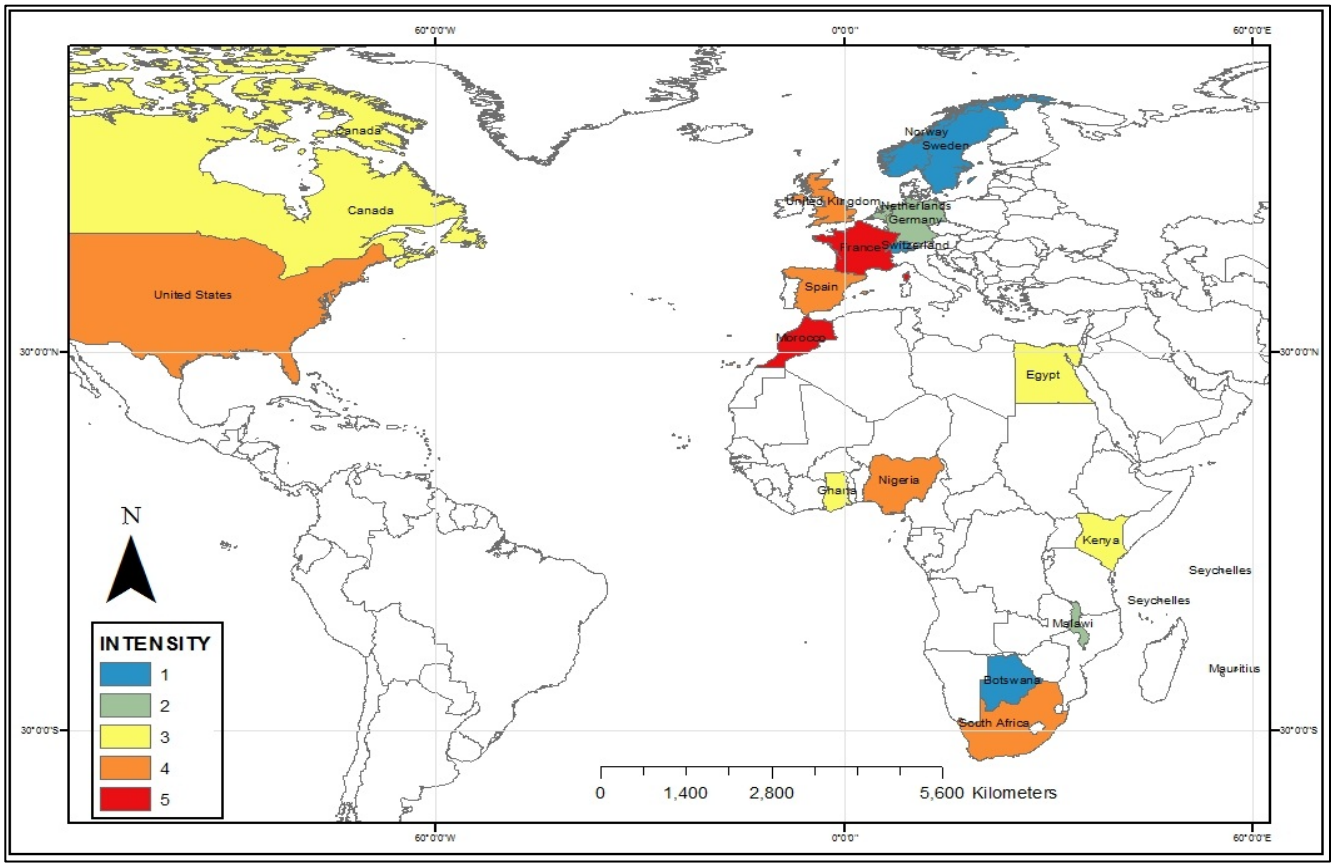

Emigration from Kenya, 1960-2017
95,698
34,768
24,289
8,741
5,141
5,703
7,743
6,659
705,216
288,751


Emigration from Malawi, 1960-2017




**Appendix 9: Intensity of migration at OECD-10, by country of origin**

Source: Author's computation from World Bank, 2018. Bilateral Estimates of Migrant Stock




**Appendix 10: Intensity of migration from "Africa-10" to "OECD-10", 1960 to 2017**

Source: Author's Computation using World Bank, 2018. Bilateral Estimates of Migrant Stock (1960 – 1980, 1990, 2000, 2013, 2017)

**Appendix 11: Diagnostic Tests: Hausman Fixed Against Random Effects Estimates**

| Dependent variable: $Migration_{ij}/Sum\ Migration_{ij}$ | Northern Africa | | | | Southern Africa | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | Egypt | | Morocco | | Botswana | | South Africa | |
| | FE | RE | FE | RE | FE | RE | FE | RE |
| Agric (z) | -0.020 | -0.014 | -0.013 | -0.013 | 0.022 | -0.060 | 0.035 | -0.056 |
| Industry (x) | -0.006 | -0.006 | -0.010 | -0.022 | -0.005 | -0.015 | -0.001 | -0.010 |
| Services (y) | -0.038 | -0.021 | 0.030 | 0.036 | -0.074 | -0.102 | -0.030 | -0.064 |
| Wage potential (probw) | -0.006 | -0.036 | -0.103 | -0.036 | 0.238 | 0..060 | 0.171 | 0.003 |
| Population ($s_j$) | 0.120 | 0.048 | 0.154 | 0.009 | 0.054 | 0.180 | -0.002 | 0.136 |
| Network (n) | 0.004 | 0.000 | 0.019 | 0.005 | -0.010 | 0.004 | -0.006 | 0.004 |
| Restrictive policy (PI) | 0.005 | 0.002 | 0.007 | 0.013 | -0.022 | 0.013 | -0.015 | 0.010 |
| Restrictive policy (PII) | 0.000 | 0.010 | 0.004 | 0.004 | -0.011 | -0.001 | -0.007 | 0.019 |
| Restrictive policy (PIII) | 0.004 | 0.000 | 0.013 | 0.016 | -0. 037 | -0.014 | -0.017 | 0.015 |
| $Chi^2$ (9) | 30.97 | | 5.50 | | 3.52 | | 29.53 | |
| Prob> $Chi^2$ | 0.00 | | 0.78 | | 0.94 | | 0.00 | |
| Obs | 40 | 30 | 40 | 30 | 40 | 30 | 40 | 30 |

**Source:** Author's computation

**Appendix 11: Diagnostic Tests: Hausman Fixed against random Effects estimates (cont'd)**

| Dependent variable: $Migration_{ij}/Sum\ Migration_{ij}$ | Western Africa | | | | Eastern Africa | | | |
|---|---|---|---|---|---|---|---|---|
| | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| | Ghana | | Nigeria | | Kenya | | Malawi | |
| | FE | RE | FE | RE | FE | RE | FE | RE |
| | | | | | | | | |
| Agric (z) | -0.012 | -0.042 | 0.008 | -0.042 | -0.000 | -0.048 | 0.012 | -0.078 |
| Industry (x) | -0.011 | -0.012 | -0.005 | -0.011 | -0.003 | -0.009 | -0.009 | -0.020 |
| Services (y) | -0.042 | -0.063 | -0.041 | -0.072 | | | -0.007 | -0.102 |
| Wage potential (probw) | 0.082 | 0.042 | 0.067 | 0.033 | 0.046 | -0.039 | 0.186 | -0.047 |
| Population ($s_j$) | 0.148 | 0.120 | 0.154 | 0.132 | 0.106 | 0.070 | -0.064 | 0.203 |
| Network (n) | -0.018 | 0.002 | -0.003 | 0.003 | -0.003 | 0.005 | -0.031 | 0.005 |
| Restrictive policy (PI) | -0.017 | -0.008 | -0.019 | -0.005 | -0.014 | 0.009 | -0.007 | 0.016 |
| Restrictive policy (PII) | -0.012 | -0.004 | -0.007 | -0.009 | -0.008 | 0.013 | -0.015 | 0.036 |
| Restrictive policy (PIII) | -0.039 | -0.028 | -0.010 | -0.005 | -0.013 | 0.015 | -0.073 | -0.011 |
| $Chi^2$ (9) | 3.07 | | 35.04 | | 7.11 | | 7.42 | |
| Prob> $Chi^2$ | 0.96 | | 0.00 | | 0.525 | | 0.59 | |
| Obs | 40 | 30 | 40 | 30 | 40 | 30 | 40 | 30 |

**Source:** Author's computation

**Appendix 11: Diagnostic Tests: Hausman Fixed against random Effects estimates (cont'd)**

| Dependent variable: $Migration_{ij}/Sum\ Migration_{ij}$ | | | | |
|---|---|---|---|---|
| **Islands** | | | | |
| | **17** | **18** | **19** | **20** |
| **Series** | **Mauritius** | | **Seychelles** | |
| **Agric (z)** | 0.004 | -0.032 | -0.008 | -0.032 |
| **Industry (x)** | -0.001 | -0.023 | -0.014 | -0.026 |
| **Services (y)** | | | | |
| **Wage potential (probw)** | 0.112 | -0.025 | -0.008 | -0.029 |
| **Population ($s_j$)** | -0.008 | 0.064 | 0.027 | 0.065 |
| **Network (n)** | 0.001 | 0.002 | -0.001 | 0.000 |
| **Restrictive policy (PI)** | -0.017 | 0.019 | 0.007 | 0.023 |
| **Restrictive policy (PII)** | -0.006 | 0.034 | 0.012 | 0.025 |
| **Restrictive policy (PIII)** | -0.054 | 0.028 | 0.006 | 0.021 |
| **$Chi^2$ (9)** | 15.29 | | 46.14 | |
| **Prob> $Chi^2$** | 0.053 | | 0.00 | |
| **Obs** | 30 | | 30 | |

**Source:** Author's computation

## Appendix 12: Spearman's Correlation Matrix

| | megy | mmor | mbot | msa | mken | mmal | mgha | mnig | mmau | msey |
|---|---|---|---|---|---|---|---|---|---|---|
| megy | 1 | | | | | | | | | |
| mmor | 0.3731 | 1 | | | | | | | | |
| mbot | 0.7269 | 0.0587 | 1 | | | | | | | |
| msa | 0.8327 | 0.2392 | 0.7994 | 1 | | | | | | |
| mken | 0.697 | 0.0403 | 0.8083 | 0.9088 | 1 | | | | | |
| mmal | 0.7537 | 0.1831 | 0.8624 | 0.9003 | 0.9399 | 1 | | | | |
| mgha | 0.8447 | 0.4265 | 0.6635 | 0.8029 | 0.6187 | 0.6829 | 1 | | | |
| mnig | 0.8247 | 0.4474 | 0.6859 | 0.8416 | 0.697 | 0.7684 | 0.9226 | 1 | | |
| mmau | 0.7459 | 0.2948 | 0.5431 | 0.6254 | 0.5875 | 0.6509 | 0.5782 | 0.6129 | 1 | |
| msey | 0.8012 | 0.1021 | 0.7998 | 0.8664 | 0.8477 | 0.8916 | 0.7309 | 0.7876 | 0.7578 | 1 |

**Source:** Author's computation

**Appendix 13: Gravity model estimates on the impact of markets and migration costs on migration, 1990, 2000, 2010**
Case II: Restrictive policy by all migrant populations

| **Dependent variable: Migration$_{ij}$/Sum Migration$_{ij}$** | **Northern Africa** | | **Southern Africa** | | **Western Africa** | | **Eastern Africa** | | **Islands** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Egypt** | **Morocco** | **Botswana** | **South Africa** | **Ghana** | **Nigeria** | **Kenya** | **Malawi** | **Mauritius** | **Seychelles** |
| C | -0.833*** (2.38) | 0.001 (0.00) | -1.194 (-1.27) | 0.092 (0.17) | -0.662 (-1.26) | -0.383 (-0.66) | 0.494 (1.41) | -0.519 (-0.44) | -0.924 (1.65) | 0.502 (0.74) |
| Agric | -0.007 (-0.92) | -0.021 (-1.24) | -0.032* (-1.94) | -0.033*** (3.43) | -0.018*** (-1.79) | -0.012 (1.04) | -0.022*** (-3.06) | -0.069** (-2.89) | -0.046*** (-3.95) | -0.016 (-1.14) |
| Industry | -0.007* (-1.63) | -0.028** (-2.64) | -0.008 (-0.76) | -0.003 (0.60) | -0.008 (-1.21) | -0.003 (0.51) | -0.005 (-1.17) | -0.018 (1.41) | -0.014 (-1.57) | -0.007 (0.92) |
| Services | -0.005 (-0.29) | 0.013 (0.30) | -0.037 (-0.76) | -0.039 (-1.40) | -0.022 (-0.71) | -0.013 (0.41) | -0.024 (-1.25) | -0.084 (1.20) | -0.083** (-2.56) | 0.000 (0.00) |
| Prob. of employment (probw) | 0.026** (2.08) | -0.001 (-0.04) | 0.046 (1.55) | 0.020 (1.21) | 0.023 (1.24) | 0.029 (1.45) | 0.003 (0.32) | -0.017 (-0.38) | 0.030 (1.41) | -0.001 (-0.07) |
| Population ($s_j$) | 0.027 (0.18) | 0.027 (0.50) | 0.080 (1.35) | 0.069** (2.03) | 0.050 (1.35) | 0.032 (0.77) | 0.046* (1.93) | 0.161* (1.94) | 0.131* (3.32) | 0.025 (0.56) |
| Distance (δ) | 0.032*** (4.06) | -0.028*** (-3.32) | -0.007 (0.18) | -0.100*** (-4.32) | -0.003 (-0.24) | -0.025 (-1.39) | -0.104*** (9.17) | -0.081*** (-2.78) | -0.054*** (-2.67) | -0.086*** (-3.17) |
| Network (n) | 0.000 (0.40) | 0.004** (2.76) | 0.004*** (2.65) | 0.007*** (7.81) | 0.002*** (2.47) | 0.004*** (3.80) | 0.010*** (13.86) | 0.005*** (2.85) | 0.005*** (4.68) | 0.008*** (5.55) |
| Restrictive policy (P_all_llI) | -0.008 (-1.04) | 0.011 (0.64) | 0.018 (0.96) | 0.010 (0.94) | -0.021* (-1.80) | -0.017 (-1.33) | -0.010 (1.38) | 0.038 (1.39) | 0.020 (1.40) | 0.024*** (1.74) |
| Restrictive policy (P_all_II) | -0.015 (-1.91) | 0.017 (0.96) | -0.013 (-0.71) | 0.001 (0.15) | -0.027 (-2.20) | -0.030** (-2.26) | -0.015** (2.00) | 0.035 (1.28) | 0.025* (1.83) | 0.017 (1.22) |
| Restrictive policy (P_all_III) | -0.014 (-1.63) | 0.013 (0.65) | 0.002 (0.12) | 0.009 (0.82) | -0.034** (-2.59) | -0.024 (-1.67) | -0.011 (-1.34) | 0.027 (0.91) | 0.014 (0.90) | 0.006 (0.43) |
| $R^2$ | 0.919 | 0.641 | 0.766 | 0.898 | 0.781 | 0.812 | 0.960 | 0.723 | 0.816 | 0.853 |
| Adjusted $R^2$ | 0.876 | 0.452 | 0.644 | 0.844 | 0.666 | 0.714 | 0.939 | 0.578 | 0.719 | 0.776 |
| RMSE | 0.008 | 0.020 | 0.020 | 0.011 | 0.013 | 0.014 | 0.008 | 0.030 | 0.015 | 0.014 |
| F-Stat | 21.59 | 3.40 | 6.25 | 16.74 | 6.80 | 8.25 | 45.71 | 4.98 | 8.43 | 11.06 |
| Obs | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |

Source: Author's computation
***, **, *: significant at 1, 5 and 10 per cent, T-values are in parenthesis
restrictive policy refers to all migrant populations

**Appendix 14: Helpman model estimates on the effect of markets, and selected migration costs on migration to country j, sectoral disaggregation 1990, 2000, 2010, 2017**

| **Dependent variable: $Migration_{ij}/Sum\ Migration_{ij}$** | | **Southern Africa** | | **Northern Africa** | | **Western Africa** | | **Eastern Africa** | | **Islands** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Egypt** | **Morocco** | **Botswana** | **S. Africa** | **Ghana** | **Nigeria** | **Kenya** | **Malawi** | **Mauritius** | **Seychelles** |
| Param of market potential (CES) | Mu (μ) | 0.047** (2.24) | -0.098 (-0.59) | 0.051 (0.50) | 0.048** (2.28) | -5.006 (0.69) | 0.032 (0.16) | 0.119 (1.12) | 1.378 (0.24) | 0.049 (0.38) | 0.057 (0.44) |
| | Sigma (σ) | -0.081 (-0.15) | -0.379 (-0.14) | 0.508 (0.50) | -0.132 (-0.23) | -0.868 (0.26) | 0.531 (0.18) | 0.020 (0.02) | 0.805 (0.99) | -0.111 (0.03) | 0.179 (0.09) |
| Parameters estimating migration cost | Transport cost (δ) | 0.328 (0.02) | 0.134 (0.01) | -1.46 (-0.01) | 0.740 (0.03) | -0.557 (0.01) | -0.055 (0.000 | -0.07 (-0.01) | 0.473 (0.08) | 0.189 (0.00) | -.084 (-0.00) |
| | Migration cost (λ) | -0.025 (-0.03) | 0.051 (0.04) | 0.115 (0.02) | -0.045 (0.04) | -3.691 (0.01) | 0.058 (0.00) | -0.004 (-0.01) | -1.061 (-0.16) | -0.017 (0.00) | -0.030 (0.00) |
| | Network (β) | -3.09e (-0.02) | 4.09e (0.05) | 1.65e (0.01) | -2.52e (-0.03) | 1.54e (0.01) | 1.79e (0.00) | -1.23e (-0.01) | 1.00e (0.31) | -0.042 (0.00) | 1.91e (0.00) |
| Destination country (j) conditions | Labour employment agric ($La_{jt}$) a5 | 0.004*** (2.79) | -0.000 (-0.07) | -0.023*** (-3.27) | 0.004*** (2.72) | -0.999** (-2.21) | -0.010 (-0.82) | -0.024*** (-3.00) | -1.702*** (-3.72) | -0.021** (-2.35) | -0.022** (-2.09) |
| | L industry ($Lxc_{jt}$) a6 | 0.001 (0.87) | -0.039*** (3.42) | 0.016 (1.64) | 0.001 (0.80) | -0.411 (-0.70) | 0.009 (0.57) | 0.018*** (1.67) | 1.525*** (2.48) | -0.010 (-0.86) | 0.013 (1.00) |
| | L services ($Ly_{jt}$) a1 | 0.049*** (7.01) | -0.028 (-0.98) | 0.122*** (4.31) | 0.047*** (6.84) | -0.373 (-0.22) | 0.072 (1.42) | 0.143*** (4.15) | 8.121*** (4.45) | 0.084** (2.29) | 0.087** (2.08) |
| | Prob. Of employment ($probw_{it}$) a2 | 0.096*** (4.87) | -0.118 (0.73) | 0.070 (0.70) | 0.095*** (4.83) | -4.307 (0.63) | 0.087 (0.44) | 0.088 (0.86) | 2.372 (0.45) | -0.005 (0.04) | 0.039 (0.32) |
| | Surface Area ($S_j$) a3 | 0.006*** (4.93) | 0.003 (0.71) | 0.004 (0.86) | 0.006*** (4.82) | -0.123 (0.43) | 0.012 (1.55) | -0.002 (0.37) | -0.000 (0.00) | -0.003 (0.06) | -0.000 (-0.04) |
| | Trend ($a_4$) | -0.097*** (11.76) | 0.049 (1.28) | -0.001 (-0.02) | -0.095*** (11.50) | -4.145 (1.41) | -0.037 (0.57) | 0.012 (0.27) | -4.084 (1.61) | 0.057 (1.26) | -0.029 (-0.53) |
| | $R^2$ | 0.924 | 0.706 | 0.662 | 0.926 | 0.970 | 0.507 | 0.764 | 0.980 | 0.578 | 0.661 |
| | Adj $R^2$ | 0.895 | 0.594 | 0.534 | 0.898 | 0.959 | 0.320 | 0.675 | 0.971 | 0.418 | 0.533 |
| | Root MSE | 0.011 | 0.022 | 0.027 | 0.010 | 1.095 | 0.031 | 0.022 | 1.080 | 0.027 | 0.025 |
| | Obs | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 37 | 40 | 40 |

***, **, *: significant at 1, 5 and 10 per cent, T-values are in parenthesis

**Appendix 15: Gravity model estimates on the effect of markets and migration costs on migration to country j, 1990 to 2010**[41]

| **Dependent variable: Migration$_{ij}$/Sum Migration$_{ij}$** | **Southern Africa** | | **Northern Africa** | | **Western Africa** | | **Eastern Africa** | | **Islands** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **South Africa** | **Botswana** | **Egypt** | **Morocco** | **Ghana** | **Nigeria** | **Kenya** | **Malawi** | **Mauritius** | **Seychelles** |
| Total labour employment (L) | -0.002*** (-2.92) | 0.006 (1.16) | 0.005*** (4.73) | -0.009** ( -2.50) | 0.005 (0.96) | 0.009** (1.92) | -0.000 (-0.02) | 0.002 (0.76) | 0.020*** (4.69) | 0.018*** (3.35) |
| Prob. Of employment (probw) | 0.019** (1.90) | 0.089 (1.47) | -0.013*** (-1.01) | 0.029 (0.79) | 0.066 (1.09) | 0.044 (0.98) | -0.133*** (-3.88) | 0.006 (0.16) | 0.064 (1.35) | -0.012 (-0.59) |
| Distance (δ) | -6.41e (-0.25) | -0.000 (-0.85) | 1.86e (1.41) | -.000 (-1.40) | -.000*** (-2.13) | -.000 ( -0.40) | -.000** (2.24) | -1.39e (-0.30) | 2.23e (0.83) | 1.44e (0.09) |
| Population ($S_j$) | -0.162*** (-6.16) | -0.599*** ( -3.84) | -0.010 ( -0.39) | 0.151* (1.78) | 0.300** (2.45) | 0.057 (-0.45) | 0.211*** (2.83) | -0.103 ( -1.25) | 0.166** (1.68) | -0.037 (-0.28) |
| Restrictive policy (p) | -0.001 (-1.39) | 0.021 (2.72) | -0.002 (-1.55) | 0.009* (1.83) | 0.008 (1.12) | -0.003 (- 0.57) | -0.016*** (-3.71) | 0.009** (1.91) | -0.004 (0.50) | -0.006 (-0.86) |
| Network (n) | -4.50e*** (3.34) | -7.26e*** (-9.10) | -1.76 (-0.12) | - 1.66e*** (-0.37) | -1.68e*** (-2.53) | -3.70e*** (-5.69) | 4.21e*** (10.56) | -1.06e** (-2.40) | -4.25e (-0.79) | -2.19e*** (-3.13) |
| Trend ($a_i$) | 0.001*** ( -4.97) | 0.006*** (4.34) | -0.000 (-0.32) | -0.001*** (-2.10) | -0.003** ( -2.29) | 0.000 (0.32) | -0.001 (-2.32) | 0.000 (0.53) | -0.002** (-2.32) | -0.000 (-0.19) |
| $R^2$ | 0.997 | 0.914 | 0.995 | 0.955 | 0.886 | 0.935 | 0.975 | 0.978 | 0.943 | 0.895 |
| Adj $R^2$ | 0.997 | 0.912 | 0.994 | 0.952 | 0.878 | 0.931 | 0.974 | 0.977 | 0.939 | 0.895 |
| Root MSE | 0.009 | 0.059 | 0.012 | 0.037 | 0.048 | 0.049 | 0.034 | 0.038 | 0.047 | 0.059 |
| Obs | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 |

**Source:** Author's computation

***, **, *: significant at 1, 5 and 10 per cent, T-Statistics are in parenthesis

[41] The bilateral-remittance decennial dataset was used. In order to take advantage of a fuller dataset for other variables, the regressions in Appendix 14 and Appendix 15 computes the years between each reported decade using the compound annual growth rate formula (CAGR = $\sqrt[10]{(Y_1/Y_0)} - 1$).

**Appendix 16: Helpman model estimates on the effects of markets and migration costs on migration to country j, 1990 to 2017**

| | | Southern Africa | | Northern Africa | | Western Africa | | Eastern Africa | | Islands | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dependent: Migration** | | **South Africa** | **Botswana** | **Egypt** | **Morocco** | **Ghana** | **Nigeria** | **Kenya** | **Malawi** | **Mauritius** | **Seychelles** |
| Param of market potential (CES) | Mu (μ) | 0.001* (1.81) | -0.010 (-1.41) | -0.005** (-2.20) | 0.017*** (4.01) | 0.000 (0.01) | -0.010 (-0.16) | 0.001 (0.51) | -0.001 (-0.05) | -0.018 (-0.35) | -0.020 (-0.40) |
| | Sigma (σ) | 2.41e (0.00) | -8.07e (-0.00) | 1.57e (0.00) | 3.59e (0.00) | -4.44e (-0.00) | 2.07e (0.00) | -4.53e (-0.00) | -2.16e ( -0.00) | 2.93e (0.00) | 1.49e*** (0.00) |
| Parameters estimating migration cost | Transport cost (δ) | -8.78e ( -0.00) | 5.04e (0.00) | 3.06e (0.00) | -2.57e (0.00) | 3.64e (0.00) | -4.84e (-0.00) | 9.61e (0.00) | 2.27e- (0.00) | -4.11e (-0.00) | -2.45e (-0.00) |
| | Migration cost (λ) | -1.222*** (-3.87) | -6.995*** (-3.24) | -0.001 (0.49) | 0.013 (.913) | 0.595** (2.11) | -0.002 ( -0.31) | 5.704*** (4.76) | 0.015 (0.28) | -0.017 (-0.22) | 0.038 (0.26) |
| | Network (β) | 1.20e (0.00) | -8.59e (-0.00) | 4.17e (0.00) | -2.71e (0.00) | 6.85e- (0.00) | 8.84e (0.00) | 2.83e (0.00) | -1.21e (-0.00) | 7.66e (0.00) | -7.59e (-0.00) |
| Destination country (j) conditions | Total labour employment ($L_{jt}$) | -0.064*** (-6.51) | -0.274*** (-4.04) | 0.041*** (3.36) | 0.176*** (5.22) | 0.081 (1.65) | 0.070 (1.50) | 0.217* ( -5.75) | 0.005 (0.18) | 0.116*** (2.92) | 0.211*** (4.14) |
| | Prob. Of employment ($probw_{jt}$) | 0.041*** (3.69) | 0.177** (2.31) | -0.040*** (-2.76) | -0.154*** (-3.84) | -0.020 (-0.45) | -0.041 (-0.66) | -0.180*** ( -4.23) | -0.018 (-0.44) | -0.020 (-0.36) | -0.029 (-0.49) |
| | Surface area ($S_j$) | 5.50e (0.44) | -1.09e (-0.43) | -5.70e (-1.51e) | -3.00e*** (-3.38) | 3.67 (0.23) | 2.20e (1.12) | -4.65e ( -1.57) | 1.52e (0.48) | -4.64e*** (-2.42) | -5.48e*** (-2.70) |
| | Trend ($a_4$) | -1.404*** (-3.66) | -8.163 (3.12) | .725 (1.52) | 7.445*** (5.73) | 0.562 (1.47) | -0.100 (-0.62) | -0.374*** ( -4.01) | 0.028 (0.28) | -0.248* (-1.73) | -0.348** (-2.03) |
| | $R^2$ | 0.997 | 0.877 | 0.995 | 0.942 | 0.880 | 0.928 | 0.967 | 0.977 | 0.943 | 0.898 |
| | Adj $R^2$ | 0.997 | 0.868 | 0.994 | 0.938 | 0.872 | 0.923 | 0.965 | 0.976 | 0.940 | 0.891 |
| | Root MSE | 0.010 | 0.070 | 0.070 | 0.035 | 0.058 | 0.049 | 0.039 | 0.038 | 0.046 | 0.058 |
| | Obs | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 |

**Source:** Author's computation

***, **, *: significant at 1, 5 and 10 per cent, T-Statistics are in parenthesis

## Appendix 17: Helpman non-linear model estimates on the location specific effects of markets, and migration costs on migrant distribution, 1990, 2000, 2010

| Dependent variable: $Migration_{ij}/SumMigration_{ij}$ | Series | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | | Egypt | Morocco | Ghana | South Africa |
| Parameter of market potential (CES) | Mu (μ) | 0.127* | -0.154 | 0.188 | 0.034 |
| | | (1.73) | (0.94) | (1.52) | (0.14) |
| | Sigma (σ) | -17.950 | 5.983 | 43.022 | 0.000* |
| | | (-0.87) | (1.10) | (0.41) | (0.000) |
| Migration costs | Migration cost (λ) | -0.008* | -0.013 | -0.016** | 0.008 |
| | | (1.75) | (-1.50) | (-2.16) | (0.60) |
| | Network (β) | 0.225 | 0.863* | -6.938 | 0.000* |
| | | (0.27) | (3.40) | (-0.80) | (0.000) |
| | Distance (δ) | -0.258 | -0.038 | 0.112 | -0.000* |
| | | (1.65) | (-0.41) | (1.16) | (-0.000) |
| | Policy category I ($a_5$) | 0.004 | -0.017* | 0.013* | 0.006 |
| | | (0.88) | (-1.93) | (1.73) | (0.45) |
| | Policy category II ($a_6$) | 0.004 | -0.023** | 0.005 | 0.001 |
| | | (0.82) | (-2.13) | (0.59) | (0.06) |
| | Policy category III ($a_7$) | 0.000 | -0.024 | 0.049** | 0.020 |
| | | (0.00) | (-1.03) | (2.45) | (0.82) |
| Destination country (j) market | Labour employment services ($a_1$) | 0.003 | -0.013 | -0.003 | 0.040* |
| | | (0.21) | (-0.40) | (0.14) | (3.34) |
| | Wage potential ($probw_{jt}$) $a_2$ | 0.140** | -0.162 | 0.184 | 0.015 |
| | | (2.12) | (-1.10) | (1.67) | (0.06) |
| | Population ($S_j$) $a_3$ | 0.014 | 0.054 | 0.016 | -0.000 |
| | | (0.76) | (1.56) | (0.57) | (-0.01) |
| | Trend ($a_4$) | -0.000** | -0.000 | -9.49e | 0.011 |
| | | (-2.49) | (-0.89) | (-0.04) | (0.12) |
| | $R^2$ | 0.932 | 0.796 | 0.813 | 0.644 |
| | Adj $R^2$ | 0.887 | 0.661 | 0.689 | 0.406 |
| | Root MSE | 0.009 | 0.018 | 0.014 | 0.026 |
| | AIC | -211.308 | | | -127.052 |
| | BIC | -195.894 | | | -111.639 |
| | Obs | 30 | 30 | 30 | 30 |

**Source:** Author's computation

***, **, *: significant at 1, 5 and 10 per cent, T-Statistics are in parenthesis

## Appendix 18: Helpman non-linear model estimates on the spatial effects of markets, and migration costs on migrant distribution, 1990, 2000, 2010, case II, unconstrained parameters

| Dependent variable: $Migration_{ij}$/ Sum $Migration_{ij}$ | Series | Northern Africa | | Southern Africa | | Eastern Africa | | Western Africa | | Islands | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Egypt | Morocco | Botswana | South Africa | Kenya | Malawi | Ghana | Nigeria | Mauritius | Seychelles |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Destination country (j) market conditions | Labour employment services ($a_1$) | 0.009** | -0.006 | 0.038 | 0.043 | 0.049** | 0.064** | 0-.028 | 0.028 | 0.010 | 0.048** |
| | | (0.004) | (0.009) | (0.028) | (0.026) | (0.020) | (0.030) | (0.033) | (0.014) | (0.008) | (0.019) |
| | Wage potential ($probw_{jt}$) $a_2$ | 0.039 | -0.111 | 0.039 | -0.103 | -0.036 | -0.053 | -0.181* | 0.025 | -0.022 | -0.019 |
| | | (0.065) | (0.234) | (0.206) | (0.205) | (0.211) | (0.351) | (0.103) | (0.138) | (0.126) | (0.173) |
| | Size (Sj) $a_3$ | 0.006*** | -0.005 | 0.004 | -0.000 | -0.003 | -0.006 | 0.071 | 0.004 | -0.009** | -0.003 |
| | | (0.001) | (0.003) | (0.009) | (0.007) | (0.010) | (0.003) | (0.044) | (0.003) | (0.003) | (0.011) |
| Migration costs | Policy category I ($a_5$) | 0.004 | 0.013 | 0.001 | 0.008 | 0.004 | 0.018 | 0.001 | -0.005 | 0.014** | 0.014 |
| | | (0.003) | (0.010) | (0.010) | (0.011) | (0.013) | (0.014) | (0.005) | (0.006) | (0.006) | (0.009) |
| | Policy category II ($a_6$) | 0.000 | 0.010 | -0.016 | 0.001 | -0.005 | 0.008 | -0.000 | -0.0191*** | 0.016** | 0.000 |
| | | (0.005) | (0.013) | (0.011) | (0.012) | (0.014) | (0.025) | (0.005) | (0.004) | (0.007) | (0.012) |
| | Policy category III ($a_7$) | 0.005 | - | -0.009 | 0.016 | 0.014 | -0.014 | -0.024* | -0.000 | 0.013 | -0.012 |
| | | (0.004) | | (0.020) | (0.029) | (0.037) | (0.028) | (0.012) | (0.017) | (0.014) | (0.019) |
| | Distance ($\delta$) | -1.699 | 0.201 | 0.791 | -0.008 | -0.794 | 1.817 | 0.043 | 0.962 | 0.178 | -1.214 |
| | | (7.176) | (0.834) | (28.581) | (0.802) | (14.245) | (33.137) | (0.060) | (39.734) | (0.815) | (13.759) |
| | Migration cost ($\lambda$) | 0.039 | 0.014 | 0.009 | 0.010 | 0.008 | 0.004 | 0.018 | 0.006 | -0.017 | 0.012 |
| | | (0.040) | (0.009) | (0.021) | (0.018) | (0.019) | (0.020) | (0.007) | (0.010) | (0.011) | (0.019) |
| | Network ($\beta$) | 0.000** | 0.090 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000*** | 0.000** | -0.284 | 0.000 |
| | | (0.000) | (0.004) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.496) | (0.000) |
| Parameter of market potential (CES) | Mu | 0.019 | -0.076 | 0.007 | -0.095 | 0.013 | 0.020 | -0.238* | 0.003 | 0.043 | 0.015 |
| | | (0 .069) | (0.267) | (0.236) | (0.238) | (0.239) | (0.372) | (0.126) | (0.159) | (0.142) | (0.201) |
| | Sigma | -2.510 | -8.973 | 0.769 | 3.357 | 0.694 | 0.602 | 5.850*** | 0.835 | -54.133 | 0.629 |
| | | (14.950) | (43.690) | (7.044) | (4.817) | (5.620) | (7.370) | (1.278) | (6.717) | (977.17) | (5.091) |
| | Trend ($a_4$) | -0.0413 | 0.065 | -0.055 | -0.002 | 0.042 | 0.127 | -0.171*** | -0.042 | 0.094** | 0.012 |
| | | (0.014) | (0.056) | (0.060) | (0.068) | (0.054) | (0.098) | (0.088) | (0.030) | (0.037) | (0.054) |
| **$R^2$** | | 0.971 | 0.700 | 0.572 | 0.523 | 0.573 | 0.533 | 0.867 | 0.716 | 0.539 | 0.575 |
| **Adjusted $R^2$** | | 0.954 | 0.527 | 0.347 | 0.273 | 0.349 | 0.248 | 0.790 | 0.567 | 0.258 | 0.351 |
| **RMSE** | | 0.006 | 0.021 | 0.027 | 0.025 | 0.026 | 0.041 | 0.012 | 0.017 | 0.024 | 0.025 |
| **AIC** | | -211.308 | -137.310 | -121.196 | -126.420 | -123.692 | -97.597 | -170.719 | -149.873 | -128.927 | -127.270 |
| **BIC** | | -195.895 | -121.897 | -105.783 | -111.007 | -108.279 | -80.782 | -155.306 | -134.460 | -112.112 | -111.857 |
| **Obs** | | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |

Source: Author's computation

***, **,*: significant at 1, 5 and 10 per cent, Standard Errors are in parenthesis

**Appendix 19: Helpman non-linear model estimates on the spatial effects of markets, and migration costs on migrant distributions, periodic evidence from 1990, 2000, 2010, Variant with manufacturing and agriculture labour combined**

| Dependent variable: $Migration_{ij}$/ Sum $Migration_{ij}$ | Series | Northern Africa | | Southern Africa | | Eastern Africa | | Western Africa | | Islands | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Egypt | Morocco | Botswana | South Africa | Kenya | Malawi | Ghana | Nigeria | Mauritius | Seychelles |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Destination country (j) market conditions | Labour employment services ($a_1$) | 0.011** (0.005) | 0.028** (0.013) | 0.020 (0.023) | 0.022 (0.023) | 0.029 (0.028) | 0.043 (0.043) | 0.034 (0.032) | 0.017 (0.017) | 0.040*** (0.010) | 0.025 (0.028) |
| | Wage potential ($probw_{jt}$) $a_2$ | 0.041*** (0.008) | -0.028 (0.022) | 0.033 (0.045) | -0.015 (0.037) | -0.035 (0.049) | -0.061 (0.051) | 0.003 (0.018) | 0.021 (0.032) | -0.054** (0.027) | -0.015 (0.042) |
| | Population ($S_j$) $a_3$ | | | | | | | -0.017 (0.027) | 0.003 (0.003) | | |
| | Size (Sj) $a_3$ | 0.006*** (0.001) | -0.010*** (0.003) | 0.003 (0.005) | -0.001 (0.004) | -0.003 (0.005) | -0.010 (0.007) | | | -0.006** (0.002) | -0.001 (0.005) |
| Migration costs | Policy category I ($a_5$) | 0.005 (0.003) | 0.011 (0.009) | 0.007 (0.013) | 0.0136 (0.012) | 0.012 (0.014) | 0.030 (0.020) | -0.004 (0.009) | -0.002 (0.010) | 0.024** (0.012) | 0.023 (0.013) |
| | Policy category II ($a_6$) | -0.001 (0.004) | 0.001 (0.011) | -0.005 (0.013) | 0.013 (0.012) | 0.011 (0.014) | 0.022 (0.020) | -0.003 (0.006) | -0.011 (0.010) | 0.024** (0.010) | 0.016 (0.014) |
| | Policy category III ($a_7$) | 0.005 (0.006) | 0.020 (0.017) | 0.015 (0.014) | 0.042 (0.029) | 0.046 (0.036) | 0.022 (0.023) | -0.010 (0.011) | 0.016 (0.016) | 0.026 (0.019) | 0.018 (0.015) |
| | Migration cost ($\lambda$) | 0.007*** (0.002) | -0.016** (0.007) | -0.008 (0.013) | -0.010 (0.012) | -0.011 (0.012) | -0.015 (0.022) | -0.008 (0.007) | -0.006 (0.007) | -0.015 (0.011) | -0.004 (0.012) |
| | Network ($\beta$) | 0.000*** (0.000 | -4.460 (8.504) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000*** (0.000) | 0.000** (0.000) | -0.000 (0.000) | -0.000 (0.000) |
| Parameter of market potential (CES) | Mu | 0.005 (0.005) | 0.031** (0.013) | 0.009 (0.018) | 0.010 (0.019) | 0.015 (0.024) | 0.019 (0.035) | 0.005 (0.013) | 0.007 (0.014) | 0.024*** (0.009) | 0.009 (0.024) |
| | Trend ($a_4$) | -0.066*** (0.011) | 0.091*** (0.028) | -0.055 (0.071) | 0.016 (0.055) | 0.051 (0.078) | 0.092 (0.082) | 0.004 (0.030) | -0.039 (0.045) | 0.091*** (0.025) | 0.015 (0.072) |
| **$R^2$** | | 0.937 | 0.662 | 0.472 | 0.375 | 0.385 | 0.301 | 0.605 | 0.615 | 0.529 | 0.378 |
| **Adjusted $R^2$** | | 0.909 | 0.511 | 0.271 | 0.137 | 0.151 | 0.035 | 0.454 | 0.468 | 0.350 | 0.142 |
| **RMSE** | | 0.007 | 0.019 | 0.029 | 0.027 | 0.030 | 0.046 | 0.016 | 0.019 | 0.022 | 0.029 |
| **AIC** | | -203.556 | -144.611 | -118.910 | -122.291 | -116.724 | -91.479 | -152.193 | -144.717 | -134.265 | -119.857 |
| **BIC** | | -190.945 | -130.599 | -106.299 | -109.680 | -104.114 | -78.868 | -139.582 | -132.106 | -121.654 | -107.246 |
| **Obs** | | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |

Source: Author's computation

***, **, *: significant at 1, 5 and 10 per cent, Standard Errors are in parenthesis