Determinants of Migration:
The Role of Social and Trade Policies

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Declaration

The thesis is the result of my own work. Material from the published or unpublished work of others which is used in the thesis is credited to the author in question in the text. No part of this thesis has been previously submitted for a degree in the University of Oxford or any other university.

Dedication

This thesis is dedicated to my parents, Teddy Maherdy and Ziska Syafri, for their love and for teaching me the virtue of dreaming big and perseverance; to my wife, Anindya Ria Kusuma, for believing in me and for always being by my side unconditionally; to my brother, Bertho Fernando, for being my best friend.

Abstract

Determinants of Migration: The Role of Social and Trade Policies

The main aim of this thesis is to investigate the role of social and trade policies as determinants of migration. The thesis has four core independent chapters that aim to address five major challenges in migration and development research: the effect of non-migration policies, the interplay and dichotomy of internal and international migration, the challenge in conducting impact evaluation of policies on migration, the bridging of structure and agency in migration research, and the way to approach explanatory complexity in migration determinants research. The contribution of this thesis falls mainly in explaining the determinants of South-North and internal migration.

On social policy, this thesis finds overwhelming evidence on the robust role of welfare services and programs in origin countries through risk-diversification and relative-redistribution channels. I propose a term called reverse magnet hypothesis and provide the identification strategy to test its robustness. One finding is that the scope and type of welfare programs influence migration decision through the behavioural influence it provides through the relaxation of financial constraints.

On trade policy, this thesis finds no migration theory can individually explain global migration. Instead, I find evidence of multiple pathways and combination of different migration theories that serve as causal conditions for total migration and high-skilled migration. This thesis finds that capital linkages play a focal role in migration. It also finds a counterfactual evidence of migration hump, which indicates that the relationships between capital, trade, and migration flows are indeed dynamic.

This thesis shows that methodological and theoretical pluralism enrich explanations on migration determinants. Also, the role of origin country determinants should no longer be neglected nor underutilised in migration determinants literature.

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I knew that a journey for a DPhil would be like a marathon, what I did not know was that such journey would be a long and a winding one, sometimes marred by bumps and lumps along the way. I would never be able to count the never-ending blessings graced upon me by Allah the Almighty, the Most Gracious, the Most Merciful. My family for trusting in me that I could finish the DPhil journey: Papa (Teddy), Mama (Ziska), Lovey Wifey (Ria), Little Bro (Bertho), in-laws (Zakir, Reni, Bianka), and the rest of my big family in Indonesia.

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The completion process of this thesis criss-crossed three continents: Europe, Asia, and Africa -so many names to mention, and yet too little space to write them down. Dominique Attala and Mary Smith were always there for me with friendly reminders about the ticking-clock for submission. My supervisor at the UN-ECA, Dr Nassim Oulmane, who allowed me the necessary space and time for me to finish the final chapter of my thesis amidst my work and missions. Also, to all my friends at PPI Oxford, Indonesian families in Oxford, and the QEH Loft with whom I shared laughs, stories, and happiness during my DPhil life in Oxford. A special shoutout to Geniki Natih (Oxford) and Fekadu (Addis Ababa) without whom I would not be able to submit in-time!

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Chapter 1

Introduction

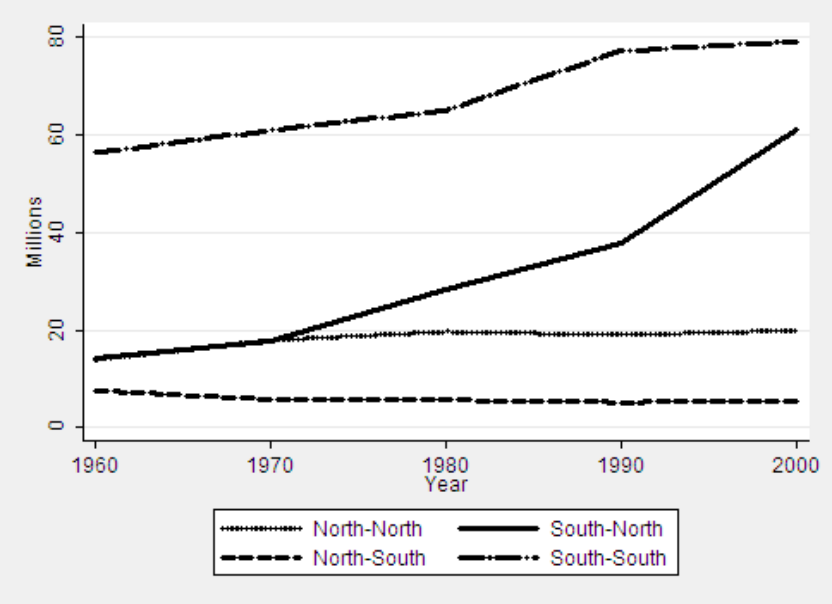
1. Background and Motivation

Why do people migrate? This is the main research question that underlies this thesis. There has been a growing body of work attempting to identify the factors that determine people's decisions to migrate (micro-level) as well as the flows and stocks of migrants (macro-level). The usual suspects are factors that are related to economic motives. The premise of securing a greater level of income has been traditionally argued as the major factor that determines migration. This argument falls under the income maximisation school of thought that forms the basis of the decision-making process of rational individuals as *homo economicus*. Thus, income gap between regions or countries are argued as the main driver of migration for both internal and international migration. In other words, 'in search of better life' motive is often thought as the root cause of migration flows from developing economies to advanced economies. In effect, it is often thought that more economic development at origin countries is the *panacea* to managing South-North migration.

According to neoclassical economics, pioneered by the work of Harris and Todaro (1970), economic development should be effective in reducing migration from poorer to wealthier areas. However, as argued by de Haas (2010), development in the broadest sense is often associated with more mobility and migration. Ozden et al. (2011) observe that albeit the fact that the majority of international migration has largely been within the South-South migration corridors, there has been a steep increase in South-North migration over the last fifty years, (figure 1.1.). As shown by Czaika and de Haas (2014), origin countries have become more diversified while prime destination countries have been shrinking over time. This hints the likelihood that as less developed countries

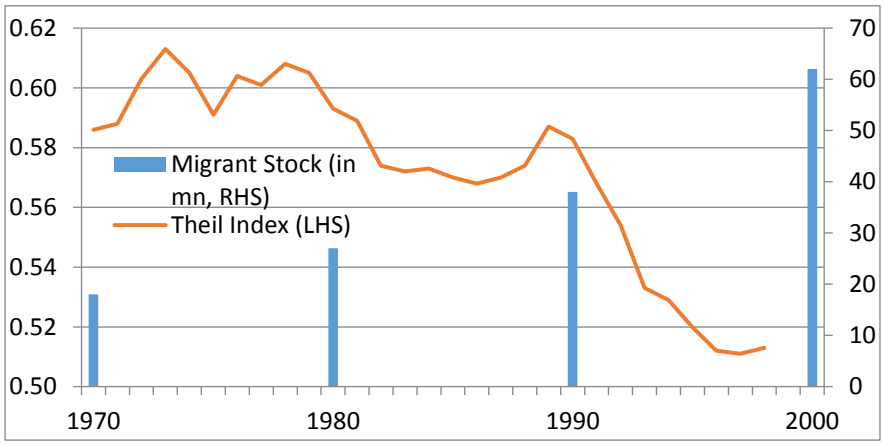
gradually become more developed, more people migrate to traditional prime destination countries, which explains the rapidly increasing number of South-North migration since the 1980s, as shown in figure 1.1. Moreover, figure 1.2. depicts that although between-country income inequality narrowed sharply between 1990 and 2000, it did not stop migration stock from doubling its level from around 35 million in 1990 to more than 60 million in 2000. This indicates that income gap alone, amidst its obvious importance as migration determinants, is not sufficient to explain the continuing positive growth trend in international migration over the last decades.

Figure 1.1. Stock of Migrants by Migration Corridors



Source: Ozden et al. (2011)

Figure 1.2. South-North Migrant Stock vs Between-Country Income Inequality



Source: Sala-i-Martin (2002) and World Bank.

In this thesis, I try to look beyond the development-migration nexus. If development is an outcome, I am interested in analysing how the inputs for development influence migration. What are the inputs for development? Public policy is an obvious candidate. Per definition, public policy is considered as the encompassing policies produced by the government that affect the public. It transcends traditional economic-related policies, as environmental and public security policies are also part of public policies. Why do policies, as inputs, matter for development? The answer lies in incentives. People are moved by incentives. Public policies basically affect people's incentives in making decisions and actions. Since people's decisions and actions determine how the economy works, good policies may lead to better development, *vice versa*. Therefore, by looking into the inputs for development, we can circumvent the 'black box' determinants related to the effect of development on migration.

For this thesis, I choose to investigate the effects of two different public policies on migration: (i) social policy, and (ii) trade policy. At first sight, the choice of these two distinct policies might raise a question regarding the relevance and connection between them. The connecting dots between these two policies are that they are rigorously used as part of development strategies by the governments in developing countries. Social policy is considered to be an effective way in boosting

human capital, a necessary ingredient for economic growth. Meanwhile, trade policy is argued to be an effective way to create jobs and to bring in capital through trade liberalisation and economic integration, that are argued to be key ingredients for economic growth.

Certainly, there are other public policies in origin countries such as industrial or labour market policies which also affect economic development. However, they do not share the central stage yet in migration theories compared to social and trade policies.[1] New economics of labour migration (NELM) has discussed how migration is part of risk-diversification strategy as well as the importance of relative deprivation as migration determinant. However, NELM has not yet fully embrace the role of social policy in risk-diversification and relative deprivation with respect to migration decisions and flows. Meanwhile, world systems theory in sociology and neoclassical trade theory in economics have long discussed the relationship between trade and migration. Nonetheless, world systems theory has mostly touched only the theoretical concepts so far whereas economic literature has been more interested in the trade-creation impact of migrants. Going back to my reasoning in choosing social and trade policies, we can see that these two policies have shared properties. They are both inputs for development. In fact, they are actively pursued as part of the development strategies in developing countries. Finally, they are also the centrepieces of contemporary migration theories yet still strikingly underdeveloped and underexplored both in theory and empirics.

Another distinct strategy employed in this thesis is that I solely focus on migration from developing countries to advanced countries (South-North migration). Migration literature has been overwhelmingly biased towards advanced countries' perspectives. As such, there is an abundant research work on the impact of migration on destination/host countries. There has been a growing

[1] Segmented labour market theory does talk about the role of labour markets' constructs as migration determinants. However, its focus is on destination countries (pull factor) instead of origin countries.

literature as well on how welfare state in advanced countries acts as a pull factor for international migration. In contrast, there is a striking lack of research on how policies or other structural factors in developing countries affect migration.

To sum up, the motivation behind this thesis and its topic is to fill in the research void on how 'inputs' factors influence migration as well as how developing countries' perspectives play their role as migration determinants. I contend that it is important to go beyond the black box of development-migration debates, and instead embrace the debates on how the 'inputs' for development affect migration. Secondly, it is critical also to gauge how structural factors in developing countries influence migration so that we can get a more comprehensive and balanced perspectives in our quest of understanding migration determinants.

2. Six Challenges in Migration Research: Thesis Contributions

In the previous section, I have explained the motivation for this thesis. Those motives are also the contributions of this thesis to the literature. However, there are further challenges in migration research that I believe are not yet fully addressed. I identify five challenges for future migration research that this thesis attempts to fill in. I do not claim these five issues to be exhaustive. However, I do contend that migration literature has been lacking in its attempt to addressing them.

First, I point out that the effect of non-migration policies is often neglected in the migration literature. This is particularly interesting because the migration impact of non-migration policies could be of greater magnitude than migration policy. Take for example the labour market policy in destination countries. More flexible labour markets in destination countries could lead to more migratory pull forces for potential migrants. Another example is from the origin countries' point of view, market liberalisation or the opening up of the origin country's economy for foreign capital could lead to temporary disruption in the domestic labour market which leads to more migration

outflows during the adjustment periods. These two policies are examples of non-migration policies which result in significant impact on migration even though the original intention and objectives of these policies are not to control migration.

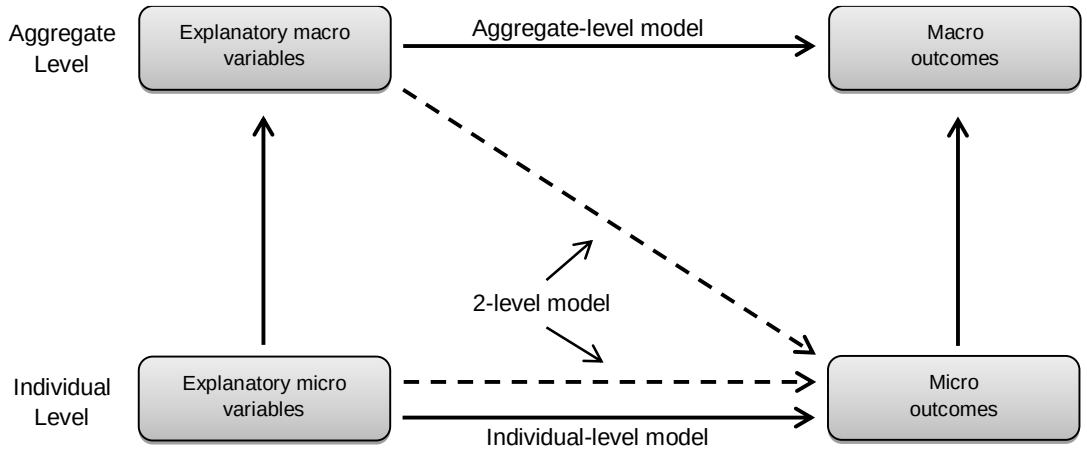
The second issue is the challenge to incorporate internal and international migration research. King and Skeldon (2010) argue that an appropriate balance is necessary to integrate both internal and international migration in empirical analyses without falling into the illusion of establishing a 'grand theory' of migration. Many migration studies have placed more emphasis on international migration whereas the discussion of internal migration more often takes place among the scholars in urban and regional sciences. I argue that it is critical to bridge these two types of migration in a systematic analysis wherever possible. The missing dimension of borders typically related to internal migration does not necessarily imply that migrating internally is always easier and more attainable. Migrating from the inner-part of China to the coastal areas of Eastern China is likely to be more gruelling to take than shorter-distance international migration. Another example is the migration from the western part of Indonesia to the eastern part of Indonesia which shares similar distance with London-Tehran, and yet it is technically considered as internal migration.

Third issue is the impact evaluation of policy on migration. Assessing policy counterfactuals in migration is by nature difficult. Like many other macro-policies, migration policies are usually non-experimental.[2] However, some non-migration policies could be quasi-natural experiments which could be assessed using non-experimental impact evaluation methods. Advances in empirical methods should be viewed by migration scholars as an opportunity to evaluate the effectiveness of policy intervention on migration flows and migration decisions. Such advances in empirical methods in the evaluation of policy interventions should be utilised fully, not only to assess the

[2] McKenzie (2012) provides the strategy forward to establish more of experimental studies on the impact of migration.

effectiveness of migration policies but also other public policies that may have unintended, indirect, or implicit effects on migration.

Figure 1.3. Multilevel Analysis: Conceptual Framework



Source: Courgeau (2003)

Fourth is the issue of bridging structure and agency. Although migration is basically a decision taken at the level of individuals, higher level variables (contextual or structural factors) are often the most important aspects in determining migration decisions. Finding the right balance between functional and structural approaches in migration research is thus particularly challenging.[3] I argue that multilevel analysis (figure 1.3.), wherever possible, should be the way in doing empirical analyses. The inclusion of contextual variables in the analysis, while at the same time teasing out causality mechanism, should be the way forward. This is even more relevant for applied policy research which has particular interests on how policy influences outcomes, such as migration flows, stocks, and decisions.

The fifth issue is how to embrace complexity of explanations. Migration research, in all disciplines, has largely attempted to bring forward simplified explanations on the question of why people migrate. Large-N studies that rely heavily on statistical estimations have the ultimate goal of

[3] Bakewell (2010) discusses the challenges in addressing agency and structure debate in migration studies.

identifying correlations and causations. Although moderation effects are certainly feasible in statistical studies, multiple interaction effects lead to complex inferences which are not advisable. Statistical studies, thus, are more suited to research questions that aim to isolate the effect of a potential factor as migration determinant. However, they are not suited to identify multiple scenarios or paths that may lead to the same outcomes. On the other hand, ethnographical approach offers rich expositions but it is quite impossible to draw causal mechanisms that also carry external validity –some even questions the internal validity of ethnographical approach. A battery of alternative empirical methods such as network analysis, fuzzy set, and scenario analysis could provide us with multiple pathways and scenarios that lead to an outcome although they are rather less useful in answering the causality issue. Above all, I contend that migration literature needs to go beyond simply finding correlations but to embrace complexity of explanations that could potentially identify multiple explanations of migration.

The sixth issue is the incorporation of spatial dependence. Social science events normally occur in sequential phases in which events in one region spread to others. Events are often not purely independent. Cluster and spatial effects hence are particularly important in gaining comprehensive understanding of migration mechanism. Other disciplines, such as political economy, have taken seriously the spatial dependence aspect of democracy and corruption ('domino effects').[4] I argue that migration studies need to also incorporate spatial dependence wherever possible. I contend that the direct inclusion of spatial effect variables, and not only correcting for spatial dependence, should be the way forward for migration research.

This thesis aims to contribute to the literature by addressing each of the first five challenges. I leave out spatial dependence issue in migration for future studies. The first challenge on the effect of non-migration policies is actually what the whole thesis is all about. Trade and social policies

[4] Leeson and Dean (2009) investigates the empirical plausibility of democratic domino theory.

are non-migration policies. The second challenge on bridging internal and international migration is addressed in chapter 3 where I simultaneously analyse the determinants of migration decisions for both internal and international migration. The third challenge on the impact evaluation of policy intervention on migration is addressed in chapter 3 and 5. In chapter 3, I employ micro-level impact evaluation whereas macro-level impact evaluation is conducted in chapter 5. Chapter 2 also to some extent addresses this challenge. The fourth challenge in bridging structure and agency is addressed in chapter 3 where I incorporate both micro- and macro-level factors as potential determinants for migration decision. Finally, the fifth challenge of embracing complexity of explanations is addressed in chapter 4 where I employ fuzzy set analysis that provides us with multiple pathways of explanations to explaining migration determinants.

3. Summary of Thesis Chapters

In the first core chapter **(chapter 2)**, I look into the impact of social policy in origin countries on migration flow. I call this effect "reverse welfare magnet".[5] I propose two mechanisms that trigger reverse welfare magnet: (i) risk-diversification, and (ii) relative-redistribution. Established migration theories have discussed, albeit implicitly, the role of social policy in the migration dynamics of developing countries. However, most empirical studies have focused more on the effect of the welfare state in destination countries on immigration, typically to test the welfare magnet hypothesis. This 'destination country bias' leaves a huge gap in migration literature in which origin countries' perspectives, especially those of the developing countries, are largely absent.

[5] Borjas (1999) introduces the 'welfare magnet' term to demonstrate the case of welfare migrants. I use the term 'reverse welfare magnet' to point out that the same concept can be applied in the context of origin countries within South-North migration discussions.

Combining bilateral migration data (DEMIG-C2C) and public expenditure data (SPEED-IFPRI) from 1985 to 2010, I employ gravity model regressions to analyse how different types of social policy expenditures, which include public spending on education, health, and social protection, influence migration flow. Since social policy is likely to be endogenous to migration flow, I conduct an instrumental variable approach to identify causality. I use election years based on political budget cycle literature and the intensity of IMF programs in-effect as instruments for social policy variables.[6] I contend that these two instruments affect social policy expenditures but not migration flows. Thus, the migration impact of political budget cycle and IMF programs is only channelled through social policy spending.

This chapter finds evidence of reverse welfare magnet which is often neglected in standard gravity model. General social policy in developing countries is found to be migration-reducing. By breaking down the social policy components, I also find support for reverse welfare magnet hypothesis albeit with varying degree of significance. Our empirical strategy addresses the issues of multilateral resistance and the presence of zeros in migration flow numbers. This chapter provides empirical support for the prediction of new economics of labour migration. That is, through the provision of better livelihood security, social policy in developing countries changes the risk profile and opportunity costs faced by migrants, hence creating the 'natural buffer' to migration, that results in lower migration flow. Therefore, better provision of social policy in developing countries could be essential in managing international migration.

The second core chapter **(chapter 3)** takes Indonesia as a case. I combine insights from new economics of labour migration and Amartya Sen's capability concept to analyse how social policy in origin country influences migration decision of households with respect to their deprivation profile and introduce a hybrid concept of financial constraints which influences migration

[6] The IMF data is from Dreher (2006).

decision.[7] This chapter looks into social protection (cash transfers) as well as quasi-public goods (infrastructure in health and education) in districts where households live. I also analyse how financial constraints due to lack of access to finance affects migration decision. The initiation of temporary unconditional cash transfers (UCT) program by the Government of Indonesia in 2005 provides a policy intervention to investigate the causal impact of social protection on migration decision. Household-level data of Indonesian Family Life Survey and Indonesian district-level data are used for the empirical analysis.

This chapter shows that social policy and financial constraints matter for migration decision. The effects, however, depend on households' deprivation profile and migration types. Using propensity score matching strategy, I find that UCT increases incentives for internal migration that is relatively cheaper but has no significant impact on the costlier international migration. By applying Alkire-Foster's dual cutoff approach, I show that multidimensionally poor households who receive UCT have less incentives to migrate internationally. Financially constrained households who are lacking access to finance are less likely to engage in international migration. Universal social policy, as proxied by better access to education and health facilities, is associated with less international migration. Internal migration is mostly an urbanisation phenomenon while I find that rural-urban location dichotomy of households does not matter for international migration.

For the third core chapter **(chapter 4)**, I link and contrast two competing theories related to trade and migration: the neoclassical trade theory in economics literature and the world systems theory in sociology literature.[8] Such approach is fruitful because while neoclassical theory predicts a substitution-relationship between trade/capital and migration, world systems theory contends that

[7] The capability approach is formally presentd in Sen (1985) while new economics of labour migration is introduced in Stark and Bloom (1985).
[8] The neoclassical prediction dates back to Mundell (1957) while world systems theory is introduced in Wallerstein (1974).

trade and foreign capital penetrations into developing countries lead to more migration. I employ an analytical qualitative method i.e. fuzzy set analysis to investigate whether trade openness and capital openness are associated with more migration from less developed countries. My goal is not to disprove a theory in favour of another but to investigate the possibility that different theories hold in different circumstances. That being said, different types of migration outcomes may have different explanatory paths which could be explained by both theories.

Since world systems theory is more suited to explain migration flows from 'periphery' countries, I solely analyse migration flows from the developing to advanced economies. In addition to total migration flow, I also analyse what determines migration selection, focusing on high-skilled migration. I find that no migration theory is able to single-handedly explain the global migration flow as none of its measures satisfies as a necessary causal condition for total and high-skilled migration. However, I find multiple pathways that explain total migration and high-skilled migration in multiple configurations. I also identify the Central and East Europe (CEE) countries exceptionalism in which these countries possess their own pathways that cause migration. By analysing how capital linkages through trade and foreign direct investment (FDI) affect migration, I find that world systems theory finds support in the CEE countries' pathways whereas neoclassical theory is more in line with the pathways of the rest of the developing world. Amidst the focal role of capital linkages, the only causal condition which consistently appears in all pathways is low GDP growth which entails that bleak domestic economy prospect is a critical structural determinant of migration.

Finally, in the fourth core chapter **(chapter 5)** I analyse how trade liberalisation policy affects migration flow. I use Mexico-United States (Mexico-US) migration as a case and the enactment of NAFTA as a quasi-natural experiment. I employ a data-driven and transparent event analysis methodology –synthetic control method- suitable for policy evaluation at the macro level to assess

counterfactual scenario. That is, I evaluate how the Mexico-US migration flow pattern would have been, had the NAFTA not been implemented.

This chapter combines data from DEMIG-C2C and MOxLAD for 1974-2010. Using regular migration from Mexico to US as 'treated unit' and the other sixteen Latin American countries to construct 'synthetic Mexico', I find non-linear impact of trade liberalisation on migration flows. There is evidence of migration hump following the implementation of NAFTA. The duration of the hump is estimated to be around fifteen years. This lengthy adjustment period was likely to be prolonged by the subsequent Mexico's financial crisis in the mid-1990s, hence taking place in the early years of NAFTA's implementation.

The findings of this chapter suggest that trade and migration are short-run complements and long-run substitutes, with a significant period of adjustment. Instead of supporting the neoclassical theory of trade and migration, our empirical evidence is more in line with the theoretical prediction of migration hump hypothesis.[9] Thus, the policy implication of this chapter is that it would be rather overoptimistic to believe that the opening of trade barriers between developing and developed countries will immediately result in migration reduction. The case for slow adjustment perios is stronger if the countries have strong migration history and network such as Mexico-US. As I have shown in this chapter, the migration-reducing impact of free trade regime will need time to materialise.

[9] This theory is introduced by Martin and Taylor (1996).

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Chapter 2

Is There a Reverse Welfare Magnet? The Effect of Social Policy in Developing Countries on International Migration

1. Introduction

It is hard to undermine the importance of social policy as migration determinant. In advanced economies -the traditional destination countries- many of the migration debates hover around the issues whether immigrants are net welfare recipients or welfare contributors and if it is prudent to limit welfare access for migrants. Against this backdrop, it is thus imperative to get a better understanding on the welfare-migration nexus. The current standing of the literature is abundant on the impact of immigration on the welfare state of advanced countries. The majority of these studies focus more on the analysis of how immigrants affect developed countries' welfare state (OECD, 2013; Rowthorn, 2008). Some other studies investigate how the welfare state plays role in attracting more immigration (Borjas, 1999; Pedersen et al., 2008). Both branches have a strong destination (advanced) country bias and only look into the role of welfare state as a likely magnet for immigration (welfare magnet hypothesis). Nannestad (2007) surveys the state of research on immigration and welfare state that further confirms the strong destination country bias in the literature.

The second strand of literature on welfare state and migration concentrates in the studies on internal migration. In this camp, the so-called welfare magnet hypothesis is more apparent in within-country migration (Day and Winer, 2006; Fiva, 2009; McKinnish, 2005; McKinnish, 2007). The strong evidence of welfare magnet in internal migration should not come as a surprise. With the absence of border restrictions, people can decide their residential choices freely without being subjected to migration policy regimes. Moreover, internal migration usually also means less

expensive migration costs. As such, potential migrants have less financial constraints should they aspire to migrate.

It is important to note that advanced economies as destination countries are not the only macro-level actors in the debate. Developing economies as origin countries also play critical roles in shaping migration through their welfare regimes. This premise is even more relevant given that rapid economic development that has been enjoyed by many developing economies should generally lead to a higher demand of (quasi-) public goods over time. This is in line with the prediction of Wagner's law. That is, government spending tends to go up as economies develop. Several cross-country studies have shown strong time-series evidence supporting Wagner's law for both advanced and developing economies (Ram, 1987; Akitoby et al., 2006).

The role of social policy in developing countries on international migration is largely neglected in the literature. Part of the explanation might be due to the lack of data on the 'welfare state' condition in developing countries, especially at the macro-level, with comprehensive frequency. It is thus not surprising that most empirical studies analyse the impact of social protection, such as welfare transfers -which is only a part of social policy, on migration decision instead of migration flow by mostly utilising micro-level survey data i.e. individual or household level. Some examples are Stecklov et al. (2005) who investigate the effect of cash transfers on migration decision using Mexico's PROGRESA data or Mahendra (2014) who analyses the impact of unconditional cash transfers following inflationary shocks using Indonesian Family Life Survey (IFLS) data. Although micro-level studies on social policy and migration are undoubtedly critical to understand migration decision dynamics, this needs to be complemented by more macro-level studies as they provide stronger argument for external validity.

Interestingly, macro-level cross-country studies researching the impact of social policy on migration flows in developing countries are strikingly lacking. One notable exception is Kurekova

(2013) who analyses the role of social policy –proxied as share of government spending- of Central and Eastern Europe (CEE) in determining emigration. In addition, it only partially covers the spectrum of social policy since it focuses more on social protection. Hence, it misses two other crucial dimensions of social policy, namely education and health spending provided by the government. Simple correlational analysis also impedes the ability of the paper to claim any causal effect and derive policy implications due to severe omitted variable bias problem.

In this paper, I solely focus on one of the most central components of public goods provision: welfare spending as manifested in various government spending in their social policy accounts.[10] Therefore, it is critical to provide an answer on the puzzle whether different conditions of social policy in both receiving and sending countries play significant role in international migration dynamics. Unfortunately, major contemporary migration theories aiming to explain the initiation of migration, in general, seem to overlook the role of social policy as international migration determinant. The case is even more so for social policy in developing sending countries.

How can social policy in developing countries affect migration? Social policy in developing countries can serve as the 'push' factor for migration or conversely as a factor that reduces the incentives to migrate ('reverse pull' factor). Social policy regime in a developing country can help ameliorate the financial constraints of its citizens. The availability of public education and public health facilities, for instance, reduces the deprivation of citizens, and may eventually increase their capability to migrate as they acquire better skills and become healthier, respectively. On the other hand, if migrating means that potential migrants will lose their entitlements on welfare programs, more generous social policy in developing countries may result in lowering the incentives for migration. Eventually, people decide to migrate if the expected benefits of migration exceed its

[10] Thus, infrastructure spending by the government, amidst its status as a crucial public goods spending, is omitted from this paper's analysis since it is not generally considered as part of social policy.

costs, taking into account their risk profiles and opportunity costs for each option. Therefore, the potential impact of social policy in developing countries on migration is theoretically ambiguous and is dependent on how individuals and households view the corresponding income and substitution effects (Mahendra, 2014). Systematic empirical studies are thus critical to better understand the effect of social policy in developing countries on migration.

In this paper, I propose two mechanisms in which social policy may affect migration: (i) risk diversification; (ii) relative-redistribution. These two channels are hybrid mechanisms by combining the new economics of labour migration theory with the recently developed migration aspiration-capability approach. The empirical results of this paper corroborate the predictions of the new economics of labour migration theory. However, by underlying our analysis within the migration aspiration-capability framework, we are also able to explain how social policy can still influence migration even in the case of increasing capability to migrate.

I refer to the 'South-North migration' framework to differentiate origin and destination countries. Although this term has become rather obsolete due to the declining trend of between-countries income inequality in the last decade as well as the rise of 'South-South' and 'North-South' migration corridors, it fits the objective of this paper in analysing the average effects of the components of social policy in developing countries on their migration flow to advanced economies.

This paper complements a growing body of literature aiming to understand social policy and migration conundrum by conducting a systematic empirical analysis on the impact of social policy in developing countries on migration. Since different types of social policy may affect migration differently, I unpack and disaggregate the types of social policy, measured as in real per capita term, and classify them into three groups: education, health, and social protection.

This paper contributes to the literature by conducting a systematic empirical cross-country analysis at the macro-level on the effect of social policy in developing countries on migration flow. I attempt to not only investigate statistical associations but go one step further to also identify and check for causality. The remainder of the paper is structured as follows. Section 2 discusses the proposed reverse welfare magnet hypothesis and its underlying the mechanisms. Section 3 introduces the data and methods used in this paper. Section 4 presents the results and the last section concludes.

2. Theory

Defining Social Policy

The origin of modern social policy dates back to the early 1940s when the government of United Kingdom assigned William Beveridge, an Oxford economist and social scientist, to lead and prepare a document surveying the state of Britain's social welfare. The document which has been colloquially called the Beveridge Report was so influential in the establishment of modern welfare states post-World War II not only in the United Kingdom but also the Western world in general (Leaper, 1991; Abel-Smith, 1992).[11] In particular, Beveridge Report identified the 'five evil giants' in the society and proposed policy measures on how to address them (Beveridge, 1942).[12] Therefore, welfare state and its social policy was a relatively recent policy invention of the mid 20th century.

Spicker (2014) defines social policy as 'the policies which governments use for welfare and social protection'. From this definition, we can see that social policy is comprised with the bulk of what

[11] The seminal work of Esping-Andersen (1990) on welfare states typology only discusses advanced Western economies. Subsequent studies have attempted to replicate the analysis on how welfare state is implemented in developed East Asian countries (Holliday, 2000; Kwon, 2005).
[12] These five evil giants are want (poverty), ignorance (insufficient education), squalor (poor housing), idleness (unemployment), and diseases (ill health).

is often regarded as public goods with two main components: welfare and social protection. Welfare spending normally consists of education and health that are traditionally provided by governments.[13] Meanwhile, social protection is inherently a tool to compensate the losers in a market economy. Hence, it is typical to see social protection spending often goes to those who are unemployed or those whose incomes are below national poverty line. Hence, welfare spending (education and health) and social protection together form the focal components of social policy that are in line with the welfare state (welfare regime) literature and the broad dimension of social policy.

One central aspect of social policy is redistribution. More specifically, social policy uses various instruments to allocate goods, services, or funds to disadvantaged segment of population in the case of social protection (direct social policy) or to general public in the case of education and health (universal social policy).

It is important to distinguish how social policy is executed in advanced and developing countries. Gough (2004) argues that 'welfare state' is a more relatable concept for advanced countries but is rather ill-suited for developing economies and argues for the use of 'welfare regime' term instead. Various types of cash transfers targeted to the poor are typical instruments in a developing country's welfare regime (Mahendra, 2014). On the other hand, given the rather under-developed labour market in developing countries, unemployment benefits are largely missing in the welfare regime of developing countries whereas it is a crucial component in advanced countries' welfare state. Thus, the emphasis of social policy for developing countries is more on 'livelihood security' in which the goals of social policy is more to support human development rather than merely

[13] Following the rise of neoliberal ideology, it is not uncommon to observe that some quasi-public goods are provided by the private sectors –hence, the quasi-markets (Le Grand, 1991). However, it does not make a real difference if our purpose is to analyse social policy spending since the funds being paid still come from the government amidst different provisional strategy.

compensating the losers in the capitalist market economies. It is not surprising that education, health, and social protection for the poor are more prevalent in the context of developing countries as opposed to unemployment benefits. This also implies that the extend of social policy in developing countries, through their welfare regimes, could indeed lead to the accumulation of human capital and increases in both aspirations and capabilities.

Typology of Welfare Magnets

Contemporary migration theories do not say much on how social policy affects migration and its mechanism. The seminal paper of Massey et al. (1993) which summarizes migration theories from multidisciplinary perspectives, for instance, does not find social policy to be an influential determinant of migration. Neoclassical theory puts forward wage and income differences as well as relative employment opportunities as the major determinants of migration. Dual-labour market theory solely relies on the persistent labour demand from destination countries as an explanation. World systems theory, on the other hand, argues that capitalist penetration and historical-colonial links are the main causes of migration. Only new economics of labour migration (NELM) theory acknowledges the role of social policy such as unemployment insurances as migration determinant. Nevertheless, as I have explained before, the lack of unemployment insurances in developing countries signifies that even NELM still provides an incomplete explanation on the potential role of social policy as migration determinant.

Interestingly, it was the study on migration selection –a sub-field of migration studies which is populated mostly by economics literature- which suggests the defining role of social policy as migration determinant albeit still from the destination countries perspectives. Borjas' (1999) seminal paper is the pioneer in the subsequent studies on the welfare-migration nexus. His paper basically argues for the existence of welfare magnet hypothesis. That is, the degree of generosity of the welfare states in destination countries –in this case advanced economies- attracts potential

migrants. Migrants tend to decide to reside in states that offer more generous welfare packages. Hence, welfare magnet hypothesis proposes the concept of welfare migrants.

Borjas (1999) paper uses intra-state migration of foreign-born individuals in the United States to support this hypothesis. This means that the original empirical test for welfare state hypothesis is indirect. Further studies, nonetheless, show mixed results. McKinnish (2007) and De Giorgi and Pellizzari (2009) find significant support for welfare magnet hypothesis in the United States and Europe, respectively. Meanwhile, Pedersen et al. (2008) and Levine and Zimmerman (1999) fail to find significant effect of welfare states on immigration. It is also argued that welfare states affect more on the sorting of migrants in which countries with generous welfare states are more prone to attract low-skilled workers while countries that are less generous in their welfare regimes are more likely to receive high-skilled workers due to its lower tax rates (Bruecker et al., 2002). Recent study shows that migration policy regime matters, in which under a free-migration regime welfare migration is more likely to be present (Razin and Wahba, 2015). However, Giulietti et al. (2013) show that empirical specification matters in the analysis of welfare magnets since different empirical strategies show mixed results for both free-migration and non-free-migration regimes.

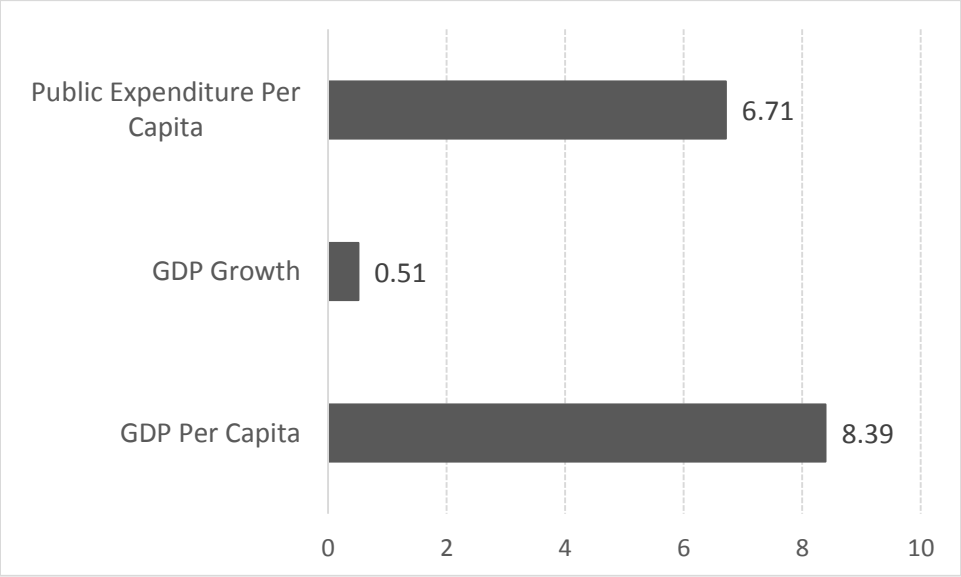
A simple look at historical data suggests that welfare magnet hypothesis is quite intuitive and appealing. As shown in figure 2.1., there is a huge gap in the social policy spending between advanced and developing countries. Between 1985 and 2010, the average public expenditure per capita in advanced countries is nearly seven times more than in developing countries'. Such pattern is quite similar to the income per capita gap between them in which the GDP per capita of advanced countries is more than eight times of developing economies'.

Figure 2.1. provides and indication that migration may be driven by both income-maximisation and risk-minimisation motives as depicted by the wide gaps in GDP per capita and public expenditure per capita, respectively. The lure of wealth induces income-maximisation motive to

migrate. Hence, a huge gap in GDP per capita between advanced and developing countries trigger more migration as argued by the neoclassical theory. Meanwhile, the generous welfare state attracts people to migrate because it provides the risk-minimisation mechanism. As such, a gaping welfare spending between advanced and developing economies means welfare migration is a sensible strategy as argued by the NELM.

Neoclassical theory argues that income gap is the major cause of migration. Although incomplete and simplified, the neoclassical argument has found empirical support in various gravity models of international migration. If we apply the same logic on social policy spending, it would be rational for potential migrants to also compare the degree of welfare states between their origin and potential destination countries? These two gaps occurred even in the times of global economic convergence as indicated by the less-than-one ratio of GDP growth between advanced and developing economies. Figure 2.1 indicates that social policy, just like development level, could be a structural determinant of migration.

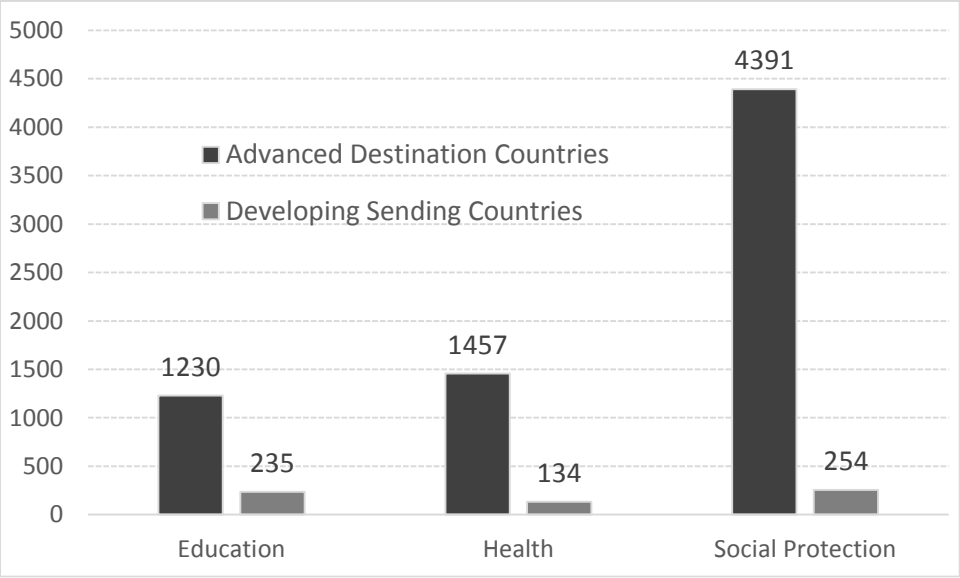
Figure 2.1. Ratio of Advanced Countries to Developing Countries (average, 1985-2010)



Source: Author's calculation based on IFPRI (2013) and World Bank data used in this paper. Sample size for advanced countries are 18 and for developing economies are 106.

If we further decompose the components of social policy into health, education, and social protection, the gaps vary. Developing countries' social policy have different emphasis compared to developed countries. The welfare regime of developing countries focuses more on social policy instruments that are expected to affect human development, and lead to positive accumulation of human capital. Hence, education spending is likely to be more established compared to other social policy components.

Figure 2.2. Social Policy Unpacked (Per capita, constant $2005, average 1985-2010)

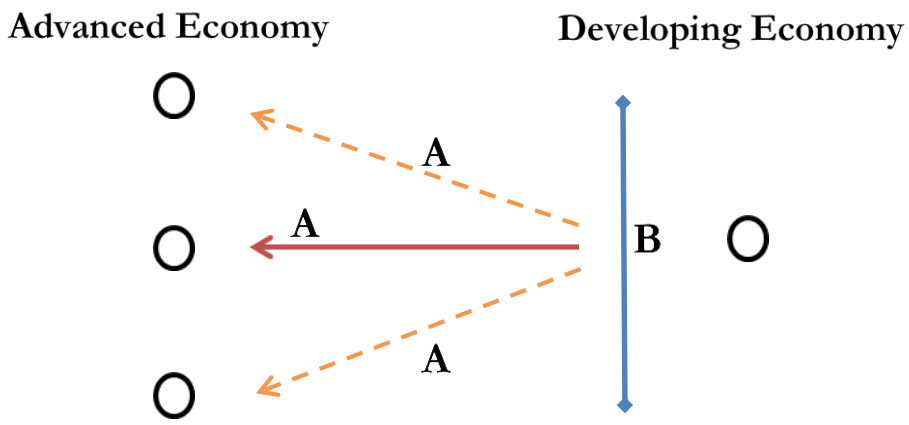


Source: Author's calculation based on IFPRI (2013) data used in this paper. Sample size for advanced countries are 18 and for developing economies are 106.

Figure 2.2. shows that social protection spending has the largest gap in which advanced countries' spending amounts to more than 18 times compared to developing countries' whereas education spending in advanced countries is merely five times of developing countries. The extravagant gap in social protection spending between advanced and developing countries is not surprising because unemployment insurances and old-age benefits are often missing in developing economies with less developed labour markets and relatively younger population. The low gap in education spending is due to the fact that education is vital for human capital in supporting long-run

economic development, thus this sector is the priority of developing countries with regards to social policy expenditure allocation. Consistent with figure 2.1., figure 2.2. also hints on the role of risk-minimisation as a migration motive.

Figure 2.3. Typology of Welfare Magnets



While welfare magnet is firmly established in the migration (selection) literature, it is quite surprising why the mirror of this phenomenon is neglected in the literature. I propose an additional type of welfare magnets: reverse welfare magnet[14].

Figure 2.3. graphically demonstrates the typology of different types of welfare magnets. A is *welfare magnet*. This is the original concept as conceived in Borjas (1999) which we have so far discussed and formed as the basis of the other two types of welfare magnets. It is important to note that A is inherently a *multilateral welfare magnet*. If one has decided to migrate, the next stage in the migration decision-making process would be the migration destination choice. Potential migrants do not make migration decision in a vacuum. They decide a destination location by comparing several potential destinations. In the migration economics literature, this is called the random utility model (RUM). Although it is basically a micro-level individual choice model in which in practice it is

[14] I thank Hein de Haas for the suggestion to use this term.

estimated by variations of discrete choice empirical models, RUM is typically useful to explain migration at the aggregate level (Beine et al., 2015). Since RUM implies that potential migrants take into account other potential migration destinations in their decision making, reverse welfare magnet concept is thus part of the concept in that these potential migrants may end up deciding that staying in their current locations is the optimal decision.

B is *reverse welfare magnet*. This type of welfare magnet is the one discussed and empirically analysed in this paper. In short, it is the mirror of the traditional welfare magnet hypothesis. The intuition of reverse welfare magnet is straightforward. Since risk-minimisation is indeed an important motivation to migrate, individuals would move to administrative locations where quasi-public goods are better provided by more generous social policy spending. Now, what would happen if the current location of potential migrants constantly improves the provision of such quasi-public goods? Would we find the similar pull effect but to an opposite direction? Assuming that the effects of welfare magnet and reverse welfare magnet are symmetric, we can say that the reverse welfare magnet acts as a kind of a 'buffer' for potential migrants. In other words, generous social policy reduces the incentives to migrate since the risk-minimisation objective of migration could be fulfilled by staying at home countries. Therefore, figure 2.3. completes Borjas (1999) welfare magnet hypothesis by incorporating the reverse welfare magnet hypothesis into the conceptual framework in which home (origin location) is compared to many possible international destinations.

Empirical studies on reverse welfare magnet are literally absent. One exception is Kurekova (2013) who argues that the great number of emigrations from CEE countries is partially caused by lower social policy spending in these countries. Her paper is relevant due to the recent inclusion of many CEE countries as part of the Euro-zone free-migration regime. However, the study is largely descriptive and does not address the issue of causality. The only empirical estimation is provided

by correlation coefficients of various social policy spending components which show the negative relationships between social policy spending and emigration rate. So far, no systematic empirical studies have been done that go beyond simple correlations and tell more about the identification of causal impacts.

Further understanding of the reverse welfare magnet is highly relevant in the migration-development debate. It has been argued that the neoclassical prediction of development leads to less migration is elusive, particularly in the wake of the aspiration-capability approach in migration (de Haas, 2010; de Haas, 2014). If one takes face-value the argument that more development will lead to greater capability to migrate, then social policy in sending countries through its reverse welfare magnet effect could be essential in driving migration aspirations since a combination of better social policy provision and favourable economic development at origin serves, respectively, the income-maximisation and risk-minimisation objectives of migration. Thus, if these two objectives are met, further migration incentives should be weaker which eventually leads to better management of international migration flows.

Most empirical studies try to address the multilateral effects of migration determinants using statistical cosmetics instead of trying to incorporate it directly in the model. The simplest form is by taking the arithmetic mean of the explanatory variable of interest and include it in the regressions as proposed by Mayda (2010). A more generic approach is proposed by Bertoli and Moraga (2013) who argue that the use of common correlated effects (CCE) estimator of Pesaran (2006) is well-suited to address the perverse effect of multilateral resistance to migration (multilateral effects) if we have high-frequency data. In contrast, I prefer to incorporate such multilateral effects explicitly into our empirical model as spatial effects. Thus, I argue that the use of spatial Durbin model is more attractive for multilateral welfare magnet in the sense that it also brings on the table policy-relevance beyond merely correcting for the biased coefficients of CCE.

Mechanisms of Reverse Welfare Magnet

This paper focuses on reverse welfare magnet. Although the origin of reverse welfare magnet hypothesis is intuitive, we have not discussed the mechanisms in which reverse welfare magnet occurs. In doing so, I will combine the NELM and the migration aspiration-capability approach to explain the mechanisms of reverse welfare magnet. I propose two mechanisms to explain reverse welfare magnet: (i) risk-diversification, (ii) relative-redistribution. As such, I argue that better coverage and intensity of social policy in developing countries provide the avenue for risk-diversification strategy and improves relative-redistribution mechanism through quasi-public goods provision so that it reduces the incentives to have higher migration aspiration even in the presence of steady growth of individual capability.

Figure 2.4. Reverse Welfare Magnet: Risk-Diversification Mechanism

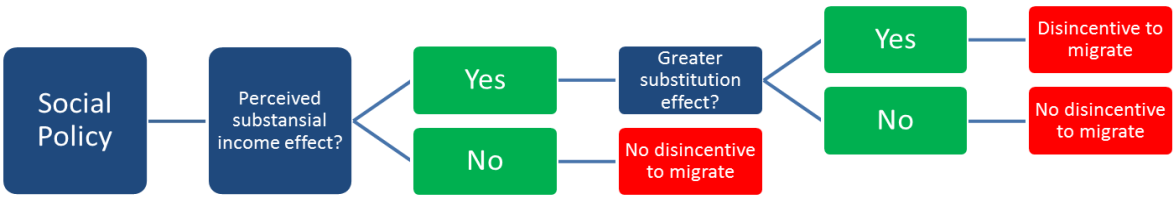


Figure 2.4. visualises the risk-diversification mechanism of the reverse welfare magnet. In principle, social policy through more generous spending in public education, public health, and social protection affects individuals and households such if they had received extra income (positive income shocks). However, these incomes are not necessarily spent as discretionary spending for households, instead they are in the form of greater degree of subsidised education or health expenditures –although for social protection schemes, it is not uncommon to come with no conditions attached. Thus, more generous public spending on education, health and social protection supports the households and individuals' objective of risk-minimisation. For example, the presence of conditional cash transfers –a type of social protection spending- might lead to

lower emigration since it requires the beneficiary's households to send their children to school as the condition to receive the cash transfers (Mahendra, 2014). Another example is the basic universal health insurance for poor households and individuals. Such policy may also lower emigration as it requires the household members to stay at home (country of origin) to be able to enjoy the benefits.

The exposition of risk-diversification mechanism relies on two important effects of social policy: income effect and substitution effect. Income effect is defined as the lifting of liquidity constraint which increases the capability to migrate. Social protection spending has an explicit income effect whereby the poor households, who are the beneficiaries of the cash transfer, can use the extra cash for discretionary spending. Education and health expenditures, on the other hand, have implicit income effects. Using the basic universal health insurance for the poor as an example. Without such social policy, individuals and households will need to allocate extra budget for private health expenditures. However, public health scheme that is financed by public health expenditures allow individuals and households to minimise risk when they are ill. The income effect is thus implicit but the effect is prevalent in minimising risk.

Substitution effect is defined as the reduction of the opportunity cost of no further-risk diversification through migration. Recall the NELM theory that stipulates migration as a risk-diversification strategy for households (Stark and Bloom, 1985; Massey et al., 1993; Taylor, 1999; de Haas, 2010). The absence or the lack of welfare (quasi-public goods) provision in the majority of developing countries means that their citizens have to rely on different strategies such as migration to cope with income and production risks. The idea is that the remittances sent by the migrants to their stay-at-home household members serve as an extra income that acts as a buffer for any potential income shocks that adversely affect the welfare and well-being of their households. If better welfare provision through a more generous social policy is available at home,

this generates a substitution effect which should lower the propensity to migrate for individuals and households. The monetary and non-monetary costs (perceived opportunity costs) of migrating or sending a household member for migration are now higher because social policy now provides the necessary institutions to diversify risk by staying at home and not migrating. As a consequence, it is more optimal economically in the longer-run to stay at their origin countries and to benefit from the public education, public health, and social protection schemes that may lead to greater returns in the future due better skill-level and health.

As depicted in figure 2.4., social policy needs to have two properties in order to have a binding effect on migration. First, its perceived effect has to be substantial. This means that the perceived income effect of social policy has to be economically significant that it affects the capability of its recipients to fulfil their functioning.[15] For example, cash transfers that only cover minor parts of individuals' or households' expenditures are not sufficient to increase their capability, and hence the impact is not substantial. Another example is partial health insurance coverage that only covers doctor's service fees and excludes medical receipts. Such policy might not be binding for poor people since they still have to allocate considerable amount of their income to pay for their medicines. The perceived impact of social policy, naturally, is not homogenous across individuals. Depending on their set of preferences, different individuals may have different criteria in grading the substance level of a social policy. In principle, the condition that social policy effect has to have substantial impact is a necessary but not sufficient condition for reverse welfare magnet.

The second condition is such that the substitution effect of social policy on migration is greater than its income effect. Recall that the first condition stipulates that income effect has to be substantial. However, the second condition contends that for migration aspiration to not increase

[15] Under Amartya Sen's capability approach, functionings is defined as 'the various things a person may value doing or being' (Sen, 1999). Freedom from poverty and malnutrition or freedom of mobility are examples of functionings (Sen, 1992; Kuklys, 2010).

substantially, the opportunity costs of migrating have to increase significantly due to social policy. If income effect is greater, this means that people's capability to migrate increases and it could be accompanied by increasing migration aspiration as well. On the other hand, if substitution effect is greater, the rising migration capability is unlikely to be proportionally followed by increasing migration aspiration.

For example, the presence of free-tuition or educational vouchers for secondary or higher-degree education levels is likely to find a condition in which the substitution effect is greater than income effect. Since potential migrants are likely to come from productive-age and younger population, social policy benefiting these groups might alter the migration propensity of these people and eventually the migration flow in aggregate. Free-tuition or educational vouchers entail that access to education for individuals at the age of 15-22 is more open. Since the return to education for higher-level of education is significantly higher, these young people may not choose to forego their current income by becoming migrants. Instead, they decide to participate in secondary and higher-education with the premise of better income in the future. This actually means that the opportunity costs of migrating are now sufficiently high so that they opt to stay home. Therefore, the risk-diversification mechanism argues that for social policy to provide disincentives for migration, it has to satisfy both conditions. That is, its impact has to be economically substantial yet its substitution effect is greater than its income effect.

The second mechanism of reverse welfare magnet is through relative-redistribution. I combine aspiration-capability approach with NELM to explain this mechanism. First, I shall start by discussing briefly the aspiration-capability approach in migration. Originally, the aspiration-capability approach in migration studies is basically the application of Amartya Sen's capability approach in welfare economics. Although not explicitly quoting Sen's works, Carling (2002) applies similar framework to analyse the 'involuntary immobility' phenomenon in Cape Verde which

basically refers to people who wish to migrate but do not possess the capability to materialise their migration aspiration.

Mahendra (2014) applies Sen's capability framework to analyse how cash transfers –an example of social protection- affect migration decision subject to the intrinsic capability of households using Alkire-Foster (2011) dual cut-off approach in the construction of capability measure. Future economic prospects, which entails uncertainty, also affect migration aspirations and explain short-term fluctuations in migration flow (Czaika, 2015).[16] Further development of the aspiration-capability framework by de Haas (2010, 2014) attempts to incorporate not only insights from Amartya Sen's work but also from Isaiah Berlin's concept of positive and negative liberties. Accordingly, de Haas (2014) defines migration aspiration and capability as the following:

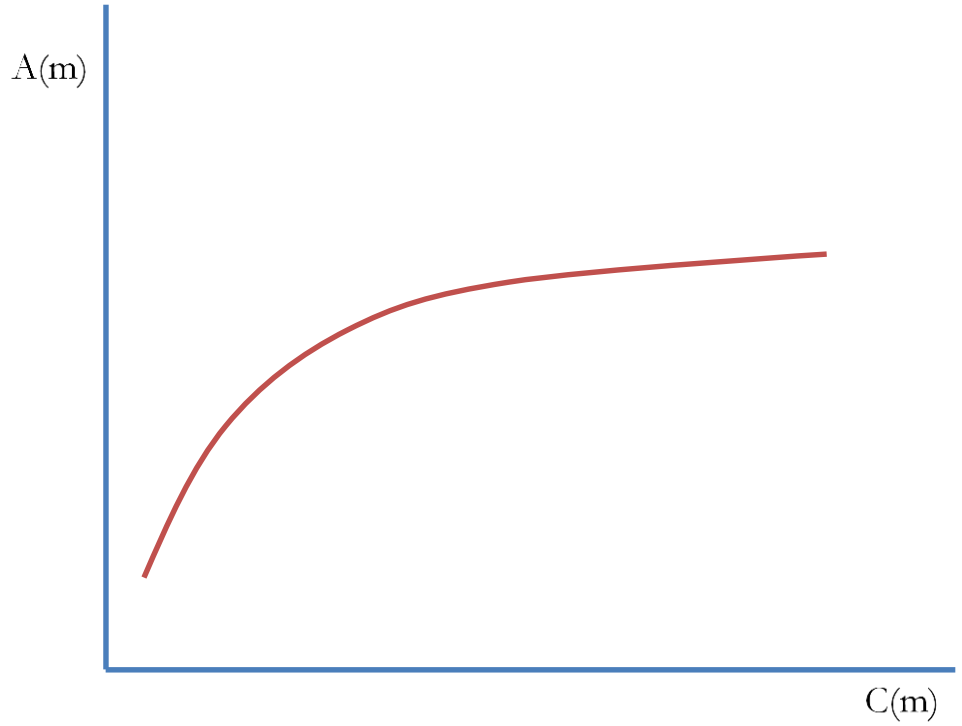
- Migration aspiration is a function of people's general life aspirations and perceived spatial opportunity structures

- Migration capability is contingent on positive liberties ('freedom to') and negative liberties ('freedom from')

Nevertheless, de Haas (2014) does not visually represent how aspiration-capability function really works. I argue that migration aspiration-capability function simply corresponds to the utility function of a risk-averse individual (figure 2.5).

[16] Czaika (2015) basically proposes a 'migration prospect theory' which has its root in behavioural economics' prospect theory. However, it is useful to explain the dynamics of migration aspirations which is a key aspect in aspiration-capability approach.

Figure 2.5. Migration Aspiration-Capability Function: Graphical Presentation

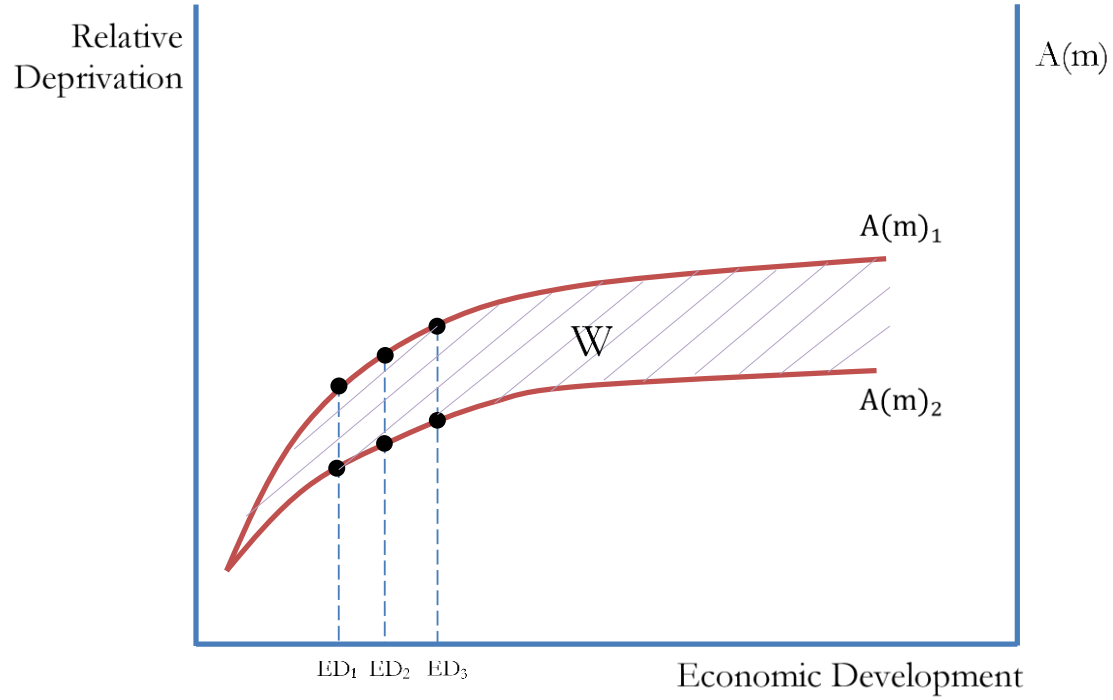


A(m) is migration aspiration. C(m) is migration capability. Here, we assume that individuals are in general risk-averse which is in line with prospect theory (Kahneman and Tversky, 1979; Rabin and Thaler, 2001).[17] Since migration inherently entails both monetary and non-monetary risks and costs, increased capability does not always necessarily lead to greater migration aspiration. In other words, there exists a *diminishing marginal aspiration to migrate* as capability increases. Thus, this is why the function in figure 5 follows a logarithmic function of y = log(x) which draws parallel to a concave utility function. At the lower level of capability, a marginal increase of capability leads to higher migration aspiration. However, at the higher level of capability, such increase in capability no longer yields a rise in migration aspiration in the same magnitude at the lower level. This migration aspiration-capability model is consistent with the migration transition theory at the macro-level proposed by de Haas (2010b) arguing that better economic development has a curvi-

[17] Although individuals in general fall more in the risk-aversion group, migrants are argued to be more of risk-affine individuals, at least relatively (Czaika, 2015; Sahota, 1968).

linear relationship with migration that explains a country's transition from net sending country to net receiving country. The non-linear relationship between development and migration proposed in migration transition theory is consistent with the migration aspiration-capability function at the micro level (figure 2.5.).

Figure 2.6. Reverse Welfare Magnet: Relative-Redistribution Mechanism



The next step is to incorporate NELM our migration aspiration-capability function. There are two important highlights in NELM theory: (i) migration as a risk-minimisation strategy; and (ii) relative deprivation as migration determinant. First, recall that risk-minimisation plays a key role in migration decision. If the institutional and socio-economic environment at home is conducive to absorb potential adverse economic shocks such as provided through quality social policy, migration aspiration should be low. As such, the respective migration aspiration-capability function (figure 2.5.) would shift downward and become flatter. Second, NELM argues that higher relative deprivation leads to increasing migration aspiration. Hence, I can add a secondary axis on the migration-aspiration function for relative deprivation since relative deprivation is proportional

to migration aspiration (figure 2.6.). The relationship between relative deprivation and economic development is not unique as it resemblances the Kuznet curve which proposes the argument that as a country develops, initially it will experience an increasing level of inequality until it reaches a point where in later stages of development, its inequality goes down thus implying an inverted-U curve (Kuznets, 1955).

For figure 2.6., I assume that individual/household capability is proportionally related with economic development. This assumption is consistent with the argument that economic development leads to more migration due to greater capability (de Haas, 2014). In other words, better economic development in general translates into better capability of households and individuals. Thus, I replace the capability, C(m), (X-axis) in figure 2.5. with economic development (figure 2.6.).

What happens if economic development gets better over time? Figure 2.6. shows that as level of economic development grows, (ED_1 -> ED_2 -> ED_3), migration aspiration goes up as well as displayed by $A(m)_1$ function. However, government can moderate migration aspiration by tweaking the relative deprivation within the economy. This is the case where social policy plays its role through redistribution mechanism.

Social policy needs to be financed, mostly by taxes. Net contributors of taxes are typically those in the upper level of income distribution. Therefore, social policy redistributes income in the society in general through its education, health, or social protection spending. As a result, effective social policy instruments shall bring down relative deprivation for any given level of economic development, as depicted by $A(m)_2$ function. Accordingly, the shaded area of W is theoretically the magnitude of the reverse welfare magnet through its redistribution mechanism.

One may point out that the mechanism in figure 2.6 only explains the reverse welfare magnet effect on low-skilled migration. Nevertheless, it is important to note that not all types of social policy are absolute redistribution from the rich to the poor. The only social policy with pure transfer characteristic is social protection. Meanwhile, education and health are mostly universal. This means that the benefits of such social policy are aimed at public in general, including those in the upper-income group of the society. For instance, it has been argued that the bulk of public health spending goes to the frontline health services providers who are non-poor yet might lack the incentives to deliver their services effectively (Center for Global Development, 2007). In addition, Ostry and Berg (2014) point out that much of education spending in developing countries go to secondary and higher education which benefits the upper-income and that substantial amount of health spending in health infrastructure is allocated for urban health facilities which may systematically exclude the poor. Therefore, I label this mechanism as relative-redistribution. Social policy improves the relative distribution for the overall members of the society –not only the poor. Hence, the provision of quasi-public goods through social policy shrinks the average relative deprivation level for everyone.

Summing up, the two mechanisms of risk-diversification and redistribution which explain reverse welfare magnet implies that empirically, we expect a negative relationship between social policy in origin countries and migration. Accordingly, the effect needs not only be negative and statistically significant but also substantially and economically meaningful.

3. Data and Method

The data structure for the empirical analysis is country-to-country (bilateral). Migration flows for each destination country (advanced economy) are from all origin countries (developing economy). This double-comparative structure allows us to include three types of variables in the empirical analysis: sending country variables, destination country variables, and dyadic variables. Hence, we

can avoid the 'destination country bias' which often occurs in the empirical analyses with unilateral data. The time period covered in the empirical analysis is from 1985 to 2010. This bilateral-panel data structure allows us to control for both time-variant and time-invariant variables. This approach thus offers a richer data structure as opposed to cross-country regressions with no time dimension. I follow IMF's definition and classification for advanced economies. All non-advanced economies are classified as developing countries –hence, the origin countries in our empirical analysis.

I combine two data sources to construct the data for the empirical analysis. First, for the bilateral migration, I use the country-to-country migration flow database compiled by the Determinants of International Migration Project at the International Migration Institute (DEMIG-C2C). Immigration flows numbers are used as the estimates for annual migration flows. Second, for social policies, I use the social spending database compiled by the Statistics of Public Expenditure for Economic Development Project at the International Food Policy Research Institute (SPEED-IFPRI). The SPEED data have several metrics on various government expenditures classified by the government functions. I utilise social policy expenditures (education, health, social protection) with the unit of per capita in real terms. Finally, for the control variables I combine various data sources from CEPII for distances, World Bank for economic and demographic variables, Quality of Government Institute for political variables, and Reinhart and Rogoff (2009) for financial crises variables. The descriptive statistics for the variables used in this paper are provided in table 2.1.

Table 2.1. Descriptive Statistics

Descriptive Statistics						
Variable	Source	Obs	Mean	Std. Dev.	Min	Max
Migration	DEMIG-C2C	26078	1579.74	10961.65	0	946156
Log distance	CEPII	26078	8.77	0.73	5.07	9.85
Common language	CEPII	26078	0.15	0.36	0	1
Colony	CEPII	26078	0.03	0.16	0	1
Contiguity	CEPII	26078	0.01	0.07	0	1
Log population	World Bank	26078	16.14	1.79	11.48	21.01
Log GDP percapita	World Bank	25467	7.51	1.20	4.80	10.96
GDP growth	World Bank	25681	4.18	5.73	-50.25	71.19
Log aid	World Bank	22358	3.09	1.37	-2.38	6.51
Quality of government	QoG-Univ. of Gotheburg & PRS Group	21833	0.48	0.14	0.06	0.94
Democracy	QoG-Univ. of Gotheburg & Polity IV	24123	3.23	6.11	-9	10
Parliamentary system	QoG-Univ. of Gotheburg & DPI	26068	0.56	0.84	0	2
Total public (social) spending percapita, 2005 ppp	SPEED-IFPRI	18835	627.40	819.33	0.007	5589.26
Public education spending percapita, 2005 ppp	SPEED-IFPRI	19157	236.56	261.44	0.001	1398.60
Public health spending percapita, 2005 ppp	SPEED-IFPRI	18899	140.21	199.52	0.003	1230.01
Social protection spending percapita, 2005 ppp	SPEED-IFPRI	18854	267.81	495.60	0.0003	3218.44
Election year	Beck et al. (2001)	26078	0.19	0.40	0	1
Number of IMF programs in effect min. 5 months for a particular year	Dreher (2006)	26078	0.41	0.53	0	2

Given the bilateral-panel data structure, I employ the gravity model for migration as the backbone of the empirical analyses (Beine et al., 2015). It is akin to the gravity models in international trade literature. This paper is particularly interested in identifying the effect of social policy variables on migration flows controlling for other determining factors. In its simplest form, the econometric specification of the pseudo-gravity empirical model used is the following:

$$Log\ Migration_{ij,t} = \beta_1 + \beta_2 Social\ Spending_{i,t-1} + \beta_3 X1_{ij,t} + \beta_4 X2_{i,t} + \alpha_i + \alpha_{j,t} + \epsilon_{ij,t}$$

Where $X1_{ij,t}$ is a vector of dyadic variables related to distances, $X2_{i,t}$ is a vector of origin country time-variant variables, α_i is origin country dummies, $\alpha_{j,t}$ is destination country-year dummies, and $\epsilon_{ij,t}$ denotes the error term. Our econometric model inherently implies that our coefficients should be interpreted as elasticities and semi-elasticities for logged-transformed variables and level variables, respectively.

Santos-Silva and Tenreyro (2006) show that log-linearisation in gravity model leads to inconsistent estimates so that the coefficients are biased. They propose a Poisson pseudo-maximum likelihood (PPML) strategy. Accordingly, I can rewrite the econometric model in its multiplicative term, in general, as follows:

$$Migration_{ij,t} = exp\left[\beta_1 + \beta_2 Social\ Spending_{i,t-1} + \beta_3 X1_{ij,t} + \beta_4 X2_{i,t} + \alpha_i + \alpha_{j,t} + \epsilon_{ij,t}\right]$$

I shall now probe more closely on each of the variables used in the empirical analysis. The dependent variable is the natural logarithm of annual immigration flows from origin to destination

countries ($Log\ Migration_{ij,t}$). I choose this specification instead of immigration rates and control for origin countries' population size. The main reason behind this decision is the ease of interpretation in identifying the elasticities and semi-elasticities of the impact of our main explanatory variables.

The main explanatory variable is $Social\ Spending_{i,t-1}$. I use three different social spending components: education, health, and social protection. Therefore, it allows us to identify the effect of each social policy on migration flows separately. I choose not to use the 'output' metrics of social policy such as years of schooling, life expectancy, as these measures also capture the degree of economic development. I also opt not to incorporate physical proxies for measuring social policy such as number of schools, number of hospitals due to data limitation. Instead, I use social policy spending as measures for social policy. One advantage is that this measures the 'input' dimension of social policy. The degree of policy commitment in social policy is captured in the extent of monetary expenditures allocated for social policy sectors. Secondly, using social policy spending provides us with consistent measurements that are standardised, thus ensure the validity of cross-country analyses. The strategy of using spending measures is also used in Kurekova (2013).

As we explore further, different social policy may have different degree of impact on migration flows. I choose to use the 'per capita, real term' measure instead of 'ratio to GDP' for social spending variables. The reasoning is two folds. First, using per capita measure prevents us from the diluting effect of the sharp decline of economic situation on social policy. Utilising social spending per capita in real terms means that our variable is not perturbed by the shrinking of the denominator, which is GDP. Recall that social spending to GDP implies that a significant economic slowdown, as proxied by GDP, could falsely lead to the impression of improvement in social spending metrics –although the increase in their values is more caused by the decrease in the GDP. Second, social spending per capita gives a more meaningful substance and view of the

extent of a country's state of social policy. Per capita values mean the average social spending from the government received in average by each individual in a country. It approximates what each individual receives which should matter more in migration decision making.

I opt to transform the social policy variables into natural logarithm forms.[18] Therefore, our empirical model with regards to social policy variables follows the multiplicative nature of theoretical gravity models. Thus, a pure constant-elasticity regression model by transforming the social policy variables into logarithmic variables, as is normally done in the log-linearisation of gravity model, is appropriate for our exercise. Moreover, in this paper, the social policy variables in logarithmic forms generally generate better results in the instrumental variable estimations.

Finally, I lag these variables by one-year to partially account for reverse causation issue. This strategy is also consistent with the policy lags argument akin to the migration policy lags on migration flows and fiscal policy lags on macroeconomic variables (Czaika and de Haas, 2013; Mountford and Uhlig, 2009). Consistent with the reverse welfare magnet hypothesis tested in this paper, I expect to observe a negative sign for the social policy variables.

The first set of control variables is dyadic ($X1_{ij,t}$). This set of control variables is comprised with various metrics of distance-related variables. First is *Log Distance*, a staple control variable in gravity models. This variable is usually a proxy for migration costs. Longer distances imply higher migration costs, both monetary like travel costs and non-monetary such as the difficult feeling of being far away from home. This variable is computed as geodesic distances which uses the latitudes and longitudes of the most important cities. Second is *Common Language*, a dummy variable which is coded as 1 if origin and destination countries share the same official primary language, and 0 otherwise. This variable could also be regarded as a proxy for migration cost since sharing the

[18] Another strategy is by not transforming the variable of interest into natural logarithm. This strategy is conducted by Tenreyro (2007) who analyses the impact of exchange rate variability on trade and Vezina (2012) who includes corruption variable, as a trade determinant, at its original values instead of their log counterparts.

same common language usually means lower non-monetary costs which eases migrants' integration in the destination countries' labour markets. Third is *Colony*, a dummy variable which is coded as 1 if the origin country was once colonised by the corresponding destination country, and 0 otherwise. As argued by the world systems theory of migration, dyads which have colonial-links may engage in a migration-enhancing relationship due to their historical roots in social, cultural, and political institutions. Fourth is *Contiguity*, a dummy variable which is coded as 1 if the origin and destination countries are adjacent, and 0 otherwise. Similar to other distance-related variables, sharing a common border implies a lower migration cost.

The second set of control variables is origin country specific ($X2_{i,t}$). This set of control variables has five time-variant variables related to the economic, demographic, and political institutions of the origin countries. First is *Log Population*, a necessary control variable since we use log migration flows as our dependent variable instead of migration rates. This variable basically controls for the country size of origin countries. Second is *Log GDP Per Capita*, a variable that captures the general level of economic development of origin country. The expected sign of this variable is still rather inconclusive since the neoclassical theory predicts a negative relationship between economic development in origin countries and emigration flows. However, recent theoretical proposition in the aspiration-capability framework has argued that economic development leads to greater capability and aspiration to migrate which may increase emigration in short- to medium-run. Third is *GDP Growth*, a variable that captures the short-term economic volatility impact on migration. Since our dependent variable is annual migration flows, it is necessary to capture some short-term dynamics of origin countries and how it affects migration. GDP growth is a plausible proxy for this. Certainly, had this paper used migration stocks as its dependent variable, this variable would be rather unnecessary. I do not log this variable because 'changes in percentage point' with regards GDP growth have more substantive and intuitive meaning than 'percent changes'. Fourth is *Log Aid*, a variable that accounts for the net official development assistance (ODA) received per capita.

The inclusion of this control variable is appropriate since the focus of this paper is on the origin country (developing countries) perspective. Due to the heterogeneity of developing countries, comprising less-developed countries to upper-middle income countries, the inclusion of aid variable further control for development level of origin countries since more developed origin countries are less likely to receive substantial ODA. Fifth is *Quality of Government*, a variable that captures the institutional development of origin countries. This variable is a constructed index of quality of government indicators published by the International Country Risk Guide (ICRG), computed by the Quality of Government (QoG) Project at the University of Gothenburg. It consists of three components of the original index: corruption, law and order, and bureaucracy quality. This variable is again a further control for development level since more developed countries tend to have better institutions. Nevertheless, better institutional quality is associated with lowering the temptation to migrate.

I include two set of dummy variables to further control unobserved factors that may affect our dependent variable. First is a set of origin country dummies (α_i). These dummies are intended to capture any unobserved time-invariant factors of origin countries that may influence migration flows. Therefore, all the effects stemming from the cultural and geographical factors of origin countries that are sticky overtime are absorbed by these dummies. Second is a set of destination country-year dummies ($\alpha_{j,t}$). These dummies basically capture all time-variant and time-invariant factors that may affect migration from the perspective of destination countries. This strategy is consistent with the main objective of this paper in the analysis of reverse welfare magnet which places its focus exclusively from the origin country perspective. Such strategy is also employed by Beine and Parsons (2015) who investigate climatic factors in origin countries as international migration determinants. The usual approach of simultaneously incorporating both origin and destination countries' factors will likely lead to unnecessary omitted variable bias problem from the destination country side if the focus of the paper is indeed on the origin country perspectives.

Therefore, the inclusion of destination country-year dummies captures all omitted variables from the destination countries both constant and time-varying factors. The inclusion of these dummies account for multilateral resistance (Beine et al., 2015; Beine and Parsons, 2015; Tenreyro, 2007). As such, the estimates for our origin countries' variables are thus robust to the factors related to the destination countries. Another benefit of this approach is that I also partially control for the effect of bilateral immigration policies imposed by the destination country on its corresponding origin country.

Econometric Issues

Our gravity model implies that ordinary least squares (OLS) should be a straightforward empirical strategy of choice for our empirical analysis. Unfortunately, simple OLS regressions are likely to be problematic and result in inconsistent estimates of the coefficients. There are two main sources of this problem: endogeneity and heteroskedasticity. Failure to address these issues yield biased estimates and gives us the wrong picture of the problem at hand.

I shall start with the endogeneity concern. There are two sources of endogeneity in the relationship between social policy, as proxied by social spending, and migration flows. First is reverse causation. Although social policy affects migration flows through its reverse welfare magnet mechanism, the presence of converse relation is plausible. Migration flows could also affect social spending.

What is the explanation for this reverse causation? As a thought experiment, we know that the majority of the migration flows from origin countries (developing countries) are composed of those of the highly-skilled, thus indicating that migrants are mostly positively selected (Bruecker and Marfouk, 2013; Docquier et al., 2007). The migration of highly-skilled individuals means a loss of potential tax receipts for the government to be used in financing its expenditures. Thus, to further prevent brain drain, this gives pressure for the origin country government to increase the scope and intensity of its public goods. Moreover, migration transition theory argues that

developing countries which are in the middle and upper income level is characterised by growing migration aspiration and capability (de Haas, 2010b). It coincides with the increasing demand for better public goods provision as development level grows, as contended by the Wagner's law. All these positive influences of emigration on social spending result in the likely upward bias of the impact of social policy on migration from origin countries. In other words, due to reverse causation, the upward bias effect of emigration on social policy results in an insignificant coefficients of social policy variables on migration or, if the upward bias is substantial enough, we can even observe a positive relationship between social policy and migration. Recall that I use lagged values of social spending variables. However, it only partially addresses the reverse causation problem.

The second source of endogeneity problem is omitted variable bias (OVB). It is plausible that there are unobserved factors that affect both social policy variables and migration flows. I incorporate a battery of time-variant origin country variables as well as origin country dummies which should moderate the OVB concern. Nevertheless, taking the conservative side of the matter, one can never be sure that the OVB is fully addressed in OLS. The direction of the bias driven by OVB depends on the relationship between the endogenous left-hand side variable and the omitted variable.

What is the likely bias direction due to OVB? Again, we know from the literature that development affects both social policy and migration. Higher level of development is likely to lead to greater demand of public goods, hence bigger social spending. Meanwhile, more development is also likely to increase migration flows due to greater migration aspiration capability. Failure to account for development variables in the regression models will likely lead to an upward bias of the effect of social policy on migration. To illustrate this bias, I re-write a simplified 'true' econometric model of our regression:

$$y = \alpha + \beta x + \gamma d + u$$

Where *y* is migration flows, *x* is social policy, *d* is unobserved development-related variable, and *u* is error term. We suppose that $\gamma \neq 0$ and that $Cov(x, d) \neq 0$. Because we fail to include *d* in the regression analysis, so that we only regress:

$$y = \alpha + \beta x + e$$

This implicates that *d* is now included in the error term (*e*=*d*+*u*). Since *x* and *d* is correlated, OLS no longer results in consistent estimates. Consequently, our OLS estimates will be asymptotically biased with the size and direction of bias depends partly on the correlation between social policy and unobserved development-related variable, as the following:

$$OVBias = \frac{Cov(x, d)}{Var(x)}$$

Recall that social policy and development is positively associated, hence $Cov(x, d) > 0$. In addition, development is also positively correlated to migration, ergo $\gamma > 0$. Thus, the effect of social policy on migration will be upward biased. If this positive bias is large enough to mask the negative effect (reverse welfare magnet) of social policy on migration, then failure to address this bias shall yield an observed positive relationship between social policy and migration –although the true impact is theoretically negative. As such, even if the upward bias is not as large, it may be substantial enough so that we observe no relationship between social policy and migration.

An OVB issue due to the missing taxation variables is also worth to discuss. Spending on social policy needs to be financed by government revenues, mostly through taxation. Hence, increases in social policy spending have to be accompanied by increases in taxation receipts. However, it is important to note that for the majority of developing countries, their tax bases are quite low due to the heavy presence of and reliance on shadow economy. This often translates into stagnant

taxation metrics such as tax ratios amidst robust and solid economic growth rates. Hence, although the dynamics of taxation clearly affects government spending, including spending on social policy, the relatively decoupling patterns of tax metrics and economic development in developing countries imply that development-related variables and measures are sufficient and accurate to capture the capacity of a country to finance its government spending. Moreover, this does not cost the significant loss of number of observations for our analyses.

Traditional gravity models with OLS also suffer from heteroskedasticity problem. The motivation behind this bias is discussed in Santos-Silva and Tenreyro (2006) in which failure to correct for this issue shall lead to inconsistent OLS estimates of the gravity models. The root cause of this problem is the presence of zero-values in our dependent variable. Conventional approach in gravity models is to transform the dependent variable i.e. migration flows or stocks into natural logarithm values. This approach means that we will drop observations with zero-values dependent variable. If the distribution of these excluded observations is different from the kept observations with positive values, we will face selection bias. Another more critical concern of these zero-values dependent variable is that if the variance of the error term, $\epsilon_{ij,t}$, depends on the values of the explanatory variables, then the inconsistency problem due to heteroskedasticity is aggravated even more. Our estimates for the explanatory variables that explain migration flows will also depend on the covariates in the presence of zeros. Table 2.1 shows that I have a pretty moderate zero-values for the migration flows (5.1%). Nevertheless, it is still necessary to address any potential concern that may arise from this problem.

Identification Strategy

The issue of the presence of zero-values and inconsistent coefficients due to heteroskedasticity could be addressed by employing the PPML estimator proposed by the Santos-Silva and Tenreyro

(2006). This strategy allows us to work at the level values instead of the log values of our dependent variable. Thus, we do not drop observations with zero-values dependent variable.

The issue of endogeneity, nonetheless, is a trickier problem. The Arellano-Bond generalised method-of-moments estimator (GMM) is not particularly suited for this paper since we have a rather long time-series (T=26). Moreover, due to the bilateral-panel structure of the data with the inclusion of destination country-year dummies, Arellano-Bond GMM is not feasible. Thus, I employ an instrumental variable (IV) estimator to establish the causal link of social policy on migration flows. The challenge is to find the valid instruments. To do so, there are three properties that need to be satisfied. First, the instrument has to be considerably strongly correlated with social policy variable, our endogenous variable. Second, the instrument should satisfy the exclusion restriction. That is, it should only affect the dependent variable through the endogenous variable. Third, the instrument should not be correlated with the error term, hence exogenous.

Based on the literature on the determinants of public expenditure, I propose two instruments for social policy: election year and IMF programs. The first property of valid instrument (instrument relevance) shall be empirically tested. In this section, I shall discuss the exclusion restriction and instrument exogeneity properties since these cannot be empirically tested. Certainly, overidentification tests could be conducted to test the exclusion restriction property but only with the assumption that at least one instrument is valid.

The use of election year as instrument is motivated by the political budget cycle hypothesis within the political business cycle literature. The main idea is that some components of government budget experience temporal cycles and swings which is induced by the electoral cycle (Drazen, 2008). In principle, it is argued that in election year, incumbent politicians shall aim to influence the election outcomes through expansionary macroeconomic policies i.e. larger government expenditure. Drazen (2001) provides the survey on the development of political business cycle theories. First theoretical camp is the opportunistic political business cycle model. This model is

originally proposed by Nordhaus (1975). The original model assumes office-seeking politicians and voters with adaptive expectations. Second theoretical camp is the partisan political business cycle model, originally proposed by Hibbs (1977). This competing model argues that politicians are more distinguished by partisan preferences over policy directions. Further refinement of the original models assumes rational voters albeit the empirical predictions remain largely the same. Cross-country studies have shown that opportunistic political business cycle model is more relevant for developing countries (Block, 2002; Schuknecht, 2000; Shi and Svensson, 2006).

I argue that election year has a positive impact on social policy variables –as hypothesised by the political budget cycle theory. The determination of election year (election dates) is usually stipulated by the constitution and law. Hence, it is unlikely that changes in migration flows will affect the timing of election. Likewise, given the degree of exogeneity of election year, it is also theoretically unlikely for election year to be correlated with the error term. However, to further mitigate such risk, for the instrumental variable regressions, I add two additional control variables. First is *democracy index* from Polity IV. Elections occur in countries with some degree of democracy. On the other hand, more autocratic countries are less likely to hold democratic elections. The second additional control is a dummy variable for *parliamentary system*. Although it is accepted that election dates are exogenous in presidential system, in the parliamentary system the election dates could be driven by political decisions due to government crises (Persson and Tabellini, 2005). The use of election year as an instrument is akin to Levitt (1997) in identifying the causal effect of police on crime. Finally, it is also unlikely that election cycle affects migration flows directly –hence it only influences migration flows through the social policy channel. It is true that based on political business cycle hypothesis, election cycle is also theoretically correlated with other macroeconomic variables. The inclusion of a battery of economic-related control variables minimises this issue –a strategy that follows Razin and Wahba (2015).

The second instrument is the number of IMF programs in effect minimum of 5 months for a particular year. I construct this instrument by summing up three different types of IMF programs: the stand-by arrangement, the extended fund facility arrangement, the structural adjustment facility arrangement (1986-1998) and its replacement, the poverty reduction and growth facility arrangement (1999-2010). The motivation in using this variable as an instrument is based on the international political economy literature on the effect of IMF programs and conditionalities. The direction of the impact of IMF programs on social policy, however, is inconclusive. Conventional wisdom holds that the presence of IMF programs hurts government expenditure, especially social policy spending due to the programs' conditionality measures which are normally contractionary (Nooruddin and Simmons, 2006). However, most empirical studies show that, in the contrary, countries that are under the IMF programs do not experience perverse cuts in health spending (Center for Global Development, 2007). Kentikelenis et al. (2015) observe the positive impact of IMF programs on health spending for low-income countries in Sub-Saharan Africa although the positive impact disappears for other regions. It is found that IMF programs slightly increase or maintain the level of public education and public health expenditures (Martin and Segura-Ubiergo, 2004). Clements et al. (2013) find that IMF programs lead to higher public education and public health spending in low income countries. Finally, Fan and Rao (2003) also find that IMF adjustment programs increase government spending and its social policy components, in general.

The explanation on the positive impact of IMF programs on social spending are two folds. These reasonings are based on the nature of the IMF fiscal austerity program which, in principle, targets fiscal deficits and aims to improve fiscal balance (Schuknecht, 1996). First, to improve fiscal balance, the government receiving IMF program could either opt to cut expenditures or raise revenues. Due to limited resources and capacity for government in developing countries to raise revenues, normally the government resorts to expenditures cut (Nooruddin and Simmons, 2006). However, the decision on which budget lines to be slashed eventually lies in the hands of the

government. That said, the government and the IMF may agree to cut budget lines which are not related to social policy but to trim spending on other sectors such as military spending (Goldstein et al., 2003). Second, since the IMF programs target a healthier fiscal balance, they typically aim to slash budget lines which have the largest portion relative to the economy as measured by the GDP. Given that in most developing countries the budget for social policy is already quite low to start with, cutting them may not significantly improve the country's fiscal balance as opposed to slashing other budget lines which are not categorised under social policy expenditures. Moreover, the government could be reluctant to cut budget lines which could trigger further social unrest on top of their economic and financial crises. Consequently, cutting the social policy expenditures is often the last resort. This may explain the majority of the empirical findings about the positive impact of IMF programs on social expenditures in developing countries.

Based on this discussion and in line with the majority findings of the empirical studies, I argue that IMF programs have a positive impact on social policy spending. We can now check for reverse causation: could migration act as the determinant of being in the IMF program? It is unlikely, since in theory migration should not have an impact in initiating economic and financial crises. However, the presence of IMF programs indeed is likely to be correlated with unobserved variables in the error term. Thus, in addition to the economic-related control variables such as economic growth, I follow the strategy employed by Razin and Wahba (2015) to include additional variables that are potentially correlated with the instrument as additional controls. In this case, I incorporate three financial crises dummies based on Reinhart and Rogoff (2009) database in the subsequent regressions for robustness checks: currency crisis, inflation crisis, and banking crisis. These crises dummies are not in the baseline and IV regressions since their inclusion results in a quite significant loss of observations. Finally, it is also unlikely that IMF programs influence migration flows directly. Accordingly, after controlling for considerable number of control variables, the only

channel in which IMF programs could affect migration flows is only through social policy variables.

4. Results

For our empirical exercise, I start the analysis with general social policy spending. As such, this is defined as the sum of real public spending per capita for education, health, and social protection. Then, I investigate the migration impact of social policy for each type of social policy separately. Social policy is composed with both targeted spending such as social protection and universal spending such as public health and education.

General Social Policy

The results of our baseline regressions are presented in table 2.2. In general, all explanatory variables, including the control variables have the expected signs albeit with varying degree of significance levels. In column 1, I add one to migration flows which are zeros so that they are not dropped in the estimations. In column 2, I directly log migration flows. Meanwhile, in column 3 and 4, I move away from OLS, which is prone to result in inconsistent estimates, to PPML. I follow the approach of Tenreyro (2007) by presenting the PPML results for both positive-only observations and all observations in regards the dependent variable values (column 3 and 4, respectively).

Table 2.2. General Social Policy: Baseline Regression

	Estimator	OLS	OLS	PPML	PPML
	Dependent Variable	Log(Migration+1)	Log(Migration)	Migration	Migration
		(1)	(2)	(3)	(4)
Origin	Log Population	1.276***	1.140***	2.110***	2.117***
		(0.31)	(0.26)	(0.52)	(0.52)
	Log GDP Per Capita	0.121	0.117	1.183***	1.188***
		(0.10)	(0.09)	(0.16)	(0.16)
	GDP Growth	0.003	0.003	0.012**	0.012**

		(0.00)	(0.00)	(0.01)	(0.01)
	Log Aid	0.029	0.031*	0.003	0.003
		(0.02)	(0.02)	(0.03)	(0.03)
	Quality of Government	-0.595***	-0.607***	-0.412	-0.414
		(0.19)	(0.19)	(0.31)	(0.31)
	Log Public Spending$_{(t-1)}$: Total (Per Capita)	**0.013**	**0.006**	**-0.140****	**-0.139****
		(0.03)	**(0.03)**	**(0.06)**	**(0.06)**
Bilateral	Log Distance	-1.285***	-1.218***	-1.390***	-1.416***
		(0.04)	(0.04)	(0.05)	(0.04)
	Common Language	1.006***	0.909***	1.449***	1.467***
		(0.07)	(0.06)	(0.06)	(0.06)
	Colony	1.842***	1.860***	1.338***	1.337***
		(0.10)	(0.10)	(0.11)	(0.11)
	Contiguity	2.653***	2.787***	3.341***	3.328***
		(0.13)	(0.13)	(0.12)	(0.12)
	Sample	All	Dep.Var. > 0	Dep.Var. > 0	All
	Constant	YES	YES	YES	YES
	Origin Country Dummies	YES	YES	YES	YES
	Destination-Year Dummies	YES	YES	YES	YES
	Observations	13171	12575	12575	13171
	R-Squared	0.68	0.70	0.89	0.89

***, **, * are significant at 1%, 5%, and 10% level respectively. Robust standard errors are in parentheses.

PPML substantially improves our regression models. Column 3 & 4 show a large increase of our R-squared from 0.70 to 0.89. Moreover, the traditional migration determinant i.e. GDP per capita is now significant. Since our origin countries are comprised with developing countries only, the positive sign of GDP per capita is not surprising and lends support to the migration transition hypothesis. PPML estimations also offer more consistent results even if we estimate only for positive migration flows. In addition, dyadic control variables in PPML also provide evidence of stronger geographical factors than historical factors which hints the waning influence of colonial links over time. Such historical factor is gradually displaced by economic factors i.e. geography is highly related to economic costs of migration.

Social policy is found to be significant with substantial impact only in the PPML estimations. Interestingly, OLS and PPML estimations offer a striking difference in inferences. OLS estimations yield positive and insignificant coefficients for social policy. In contrast, PPML estimations result in negative and significant effects of social policy. Recall the problem with OLS we discuss in the previous section. Our exercise shows the functional form issue faced by OLS in gravity models. In addition to giving us the wrong signs, column 1 and 2 also have non-consistent coefficients. In PPML, the decision to exclude or include zero migration flows do not affect our coefficients (column 3 and 4 have coefficients of -0.140 and -0.139, respectively). PPML estimations support the reverse welfare magnet hypothesis proposed in this paper.

Although PPML addresses problems due to functional form and heterogeneity, it fixes neither omitted variable bias nor reverse causality issues. This highlights the potential endogeneity problem which I have discussed in the previous section. I contend that the endogeneity problem results in an upward bias of the social policy variable.

I employ three instruments consistently across different type of social policy variables. This includes a variable for next year's election at period t. Table 2.3 provide the results of our instrumental variables regressions. Our instruments have the expected signs and all of them are statistically significant. Since the model is overidentified, we can run Hansen J statistics to test for overidentifying restrictions as shown in Column 5. We fail to accept the null hypothesis, hence providing support for the validity of our instruments. Our instruments are also shown to be correlated with the endogenous variable as shown in the first-stage regression results as well as a high value of Angrist-Pischke chi-square (175.71). It is also important to check if our instruments are weak. The problem with weak instrument is that it gives us biased estimates which might even be larger than OLS. However, our 2SLS estimates are not suspect to weak instrument problem as its Angrist-Pischke F stat value is also high (58.18).

Table 2.3. General Social Policy: Instrumental Variable Regressions

	Estimator	2SLS	LIML	IV-GMM	IV-PPML
	Dependent Variable	Log(Migration)	Log(Migration)	Log(Migration)	Migration
		(5)	(6)	(7)	(8)
Origin	Log Population	1.425***	1.427***	1.407***	0.694
		(0.28)	(0.28)	(0.28)	(0.50)
	Log GDP Per Capita	1.242***	1.248***	1.230***	1.198***
		(0.40)	(0.40)	(0.39)	(0.33)
	GDP Growth	0.002	0.002	0.002	-0.004
		(0.00)	(0.00)	(0.00)	(0.00)
	Log Aid	0.041**	0.041**	0.041**	0.019
		(0.02)	(0.02)	(0.02)	(0.02)
	Quality of Government	-0.547***	-0.547***	-0.546***	-0.645
		(0.15)	(0.15)	(0.15)	(0.16)
	Democracy$_{(t-1)}$	0.009**	0.009**	0.009**	0.000
		(0.00)	(0.00)	(0.00)	(0.00)
	Parliamentary System$_{(t-1)}$	0.151**	0.152**	0.151**	0.193***
		(0.06)	(0.06)	(0.06)	(0.07)
	Log Public Spending$_{(t-1)}$: Total (Per Capita)	**-0.559*** **	**-0.563*** **	**-0.557*** **	**-0.775*** **
		(0.20)	**(0.20)**	**(0.20)**	**(0.28)**
Bilateral	Log Distance	-1.296***	-1.296***	-1.296***	-1.438***
		(0.03)	(0.03)	(0.03)	(0.03)
	Common Language	0.920***	0.920***	0.919***	1.123***
		(0.05)	(0.05)	(0.05)	(0.05)
	Colony	1.861***	1.861***	1.860***	1.723***
		(0.08)	(0.08)	(0.08)	(0.10)
	Contiguity	2.678***	2.678***	2.678***	2.180***
		(0.13)	(0.13)	(0.13)	(0.15)
	Constant	YES	YES	YES	YES
	Origin Country Dummies	YES	YES	YES	YES
	Destination-Year Dummies	YES	YES	YES	YES
	Observations	12272	12272	12272	12840
	First stage regression: instruments				
	Election Year$_{(t)}$	-0.037***			
		(0.01)			
	Election Year$_{(t-1)}$	0.033***			
		(0.01)			

IMF program in effect$_{(t-1)}$	0.110***	
	(0.01)	
Identification statistics:		
Hansen J stat (p-value)	0.611	0.684
Angrist-Pischke chi-sq	175.710	
Angrist-Pischke F stat	58.180	

***, **, * are significant at 1%, 5%, and 10% level respectively. Robust standard errors are in parentheses.

Another diagnostic strategy to check whether our 2SLS estimates are substantially biased is by conducting LIML estimator (Column 6). LIML gives less precise results but are more robust to potential bias driven by weak instruments. Therefore, if the coefficients of social policy variable between 2SLS and LIML are not too far-fetched, we can be confident with the estimate given by 2SLS. As we can see by comparing the coefficients of our endogenous variable in column 5 (-0.559) and column 6 (-0.563), these two coefficients are similar in magnitude. In fact, the LIML estimate for social policy is still significant at 1% level.

I also estimate IV-GMM (column 7) regressions which provides more efficiency gain compared to 2SLS. As we can see, the coefficients are technically unchanged also with the same significance level. Finally, it is also ideal to also perform IV-regression using PPML (Beine et al., 2015). Column 8 shows that by taking into account the potential bias from zero-values and heteroskedasticity, the effect of social policy on migration is still highly significant even with a greater magnitude i.e. a 10 percent increase in social spending leads to 7.75 percent reduction in migration flows in general, holding other things constant.

What is the implied substantive significance of the coefficient? To gauge the estimated impact of general social policy on migration for different level of social policy spending, I compute the marginal effect for each decile of general social spending. This exercise is based on the IV-PPML regression (column 8). The estimates are shown in table 2.4.

There are a few interesting observations that we take away from this exercise. First, as shown in table 2.4., the negative impact of social policy varies across developing countries. As level of social

spending grows larger, the negative impact of social policy on migration flow becomes more significant. This implies that the reverse welfare magnet is largely driven by developing countries with higher level of social spending. As we can see, the reverse welfare magnet starts to become significant from the 5th decile (p50) upward. This equates to around $263 of social spending per capita in real terms.

Second, this means that for developing countries with below-average level of social spending, social policy is largely ineffective in reducing migration. One potential explanation is that people from these countries are too poor to migrate. Less developed countries tend to have less social spending due to lack of financial capacity. In result, their level of social spending per capita is comparatively lower than the more developing countries. Consequently, both channels of reverse welfare magnet i.e. risk-diversification and relative-redistribution do not work effectively. Regarding the former, the amount of social spending per capita is too small to be substantial enough as a tool for risk-diversification. While for the later, since the capability of people on less developed countries are already low, social policy spending is not effective in reducing migration aspiration. In other words, the income effect of social policy on migration decision may dominate its substitution effect. These two arguments explain the volatile impact of social policy has on migration flows for less developed countries in table 2.4 (p10 to p40), as evidenced by the wide interval between lower and upper estimates.

Why do the magnitudes of reverse welfare magnet decrease as level of social spending per capita increases? As we can see in table 2.4., reverse welfare magnet is the greatest for developing countries that are in the middle of the distribution in regards level of social spending per capita. This evidence in principle supports the aspiration-capability model we discuss previously (figure 2.6). As countries become more developed, migration aspiration in general faces a diminishing growth. This corresponds to the migration transition hypothesis. Hence, for any given level of economic development, the migration-reducing effect due to reverse welfare magnet decreases.

Table 2.4. Marginal Effects: General Social Policy on Migration Flow

		Estimated impact on migration flows			
Level of social spending per capita (by every 10th percentile)	percentile	lower estimates (95% confidence interval)	point estimates	upper estimates (95% confidence interval)	significance level
	p10	-27093.85	-8623.79	9846.26	not significant
	p20	-16055.83	-5653.78	4748.27	not significant
	p30	-10116.80	-3923.36	2270.07	not significant
	p40	-6785.33	-2878.50	1028.32	not significant
	p50	-4114.10	-1971.48	171.13	10%
	p60	-2704.20	-1448.61	-193.02	5%
	p70	-1936.29	-1141.24	-346.18	1%
	p80	-1382.15	-903.25	-424.34	1%
	p90	-897.32	-676.75	-456.17	1%

Components of Social Policy: Education, Health, and Social Protection

Ideally, the effect of each component of social policy (education, health, and social protection) is also analysed using instrumental variable regressions to minimise endogeneity problem. However, although the effect of political budget cycle (election years) and IMF programs on social policy are well documented in the literature, their effects on each social policy component are less clear. For instance, although it makes sense to argue that during election years incumbents have incentives to expand social protection spending to secure more votes, such action might need an approval from the parliament which dilutes the potential political budget cycle effect. In addition, limited capability to ensure effective social protection schemes by the less developed countries could also deter the political budget cycle of social protection spending. The case could be different for education spending, for example, because the incumbents may have greater discretion in their hands to boost education spending around election times. Such variations in the potential explanatory power of our instruments on each social policy component poses a challenge.

Nevertheless, to keep the consistency of our empirical strategy in this paper, I pursue the same exercises for each social policy component.

I start with education policy. It is commonly accepted that younger people who are in their productive age are more likely to engage in migration activities. They are more mobile and normally aspire to climb the social mobility ladder. Developing countries tend to have younger population yet at the same time suffer from relatively low-skilled population. The problem is even more prevalent for less developed countries. Therefore, it is normal for developing countries to allocate a substantial amount of its national budget towards public education provision, especially for primary and junior-secondary education levels. The relative lack of private provision magnifies the need for government involvement in public education provision.

It is true that the impact of education spending to individuals may diminish after a certain age. For individuals who have passed the standard-age for formal education, the only related education spending is only government-supported and -financed trainings. Hence, for these individuals, public education spending may not be that influential. However, since our analyses are at the macro-level, the impact of education spending over time in aggregate should be constant. Individuals who are no longer in school-age have children and they perceive education spending allocated for their children. Therefore, our education spending as a variable should have a lasting and constant impact on migration, even after certain age, as in aggregate migration flows comprise of migration decisions made by individuals and households with and without children.

Table 2.5. shows the results for education policy regressions. As we can see, our estimates yield similar results with the general social policy estimates. Control variables are more consistent with theory for the PPML regressions. Similar to the general social policy regression, geographical dyadic variables show larger effects in PPML regressions. Moreover, the positive effect of economic development on migration is also evident. OLS regressions (column 9 and 10) show positive effects of education policy on migration flows. However, once we employ PPML (column

11 and 12), the coefficients change signs to negative, thus they are in support of the reverse welfare magnet hypothesis. Without accounting for endogeneity, the reverse welfare magnet effect is rather modest and not that far from the general social policy variable we discussed earlier.

Table 2.5. Education Policy: Baseline Regressions

	Estimator	OLS	OLS	PPML	PPML
	Dependent Variable	Log(Migration+1)	Log(Migration)	Migration	Migration
		(9)	(10)	(11)	(12)
Origin	Log Population	1.294***	1.128***	2.250***	2.257***
		(0.31)	(0.26)	(0.51)	(0.51)
	Log GDP Per Capita	-0.032	-0.041	1.128***	1.131***
		(0.10)	(0.09)	(0.16)	(0.16)
	GDP Growth	0.004	0.005*	0.013**	0.013**
		(0.00)	(0.00)	(0.01)	(0.01)
	Log Aid	0.036**	0.037**	0.009	0.009
		(0.02)	(0.02)	(0.03)	(0.03)
	Quality of Government	-0.663***	-0.672***	-0.355	-0.358
		(0.18)	(0.18)	(0.30)	(0.30)
	Log Public Spending$_{(t-1)}$: Education (Per Capita)	**0.051****	**0.045****	**-0.100***	**-0.099***
		(0.02)	**(0.02)**	**(0.06)**	**(0.06)**
Bilateral	Log Distance	-1.309***	-1.238***	-1.389***	-1.416***
		(0.04)	(0.04)	(0.04)	(0.04)
	Common Language	1.013***	0.910***	1.427***	1.446***
		(0.06)	(0.06)	(0.06)	(0.06)
	Colony	1.836***	1.868***	1.355***	1.354***
		(0.10)	(0.09)	(0.10)	(0.10)
	Contiguity	2.676***	2.821***	3.344***	3.331***
		(0.13)	(0.13)	(0.12)	(0.12)
	Sample	All	Dep.Var. > 0	Dep.Var. > 0	All
	Constant	YES	YES	YES	YES
	Origin Country Dummies	YES	YES	YES	YES
	Destination-Year Dummies	YES	YES	YES	YES
	Observations	13627	12978	12978	13627
	R-sq	0.68	0.70	0.89	0.89

***, **, * are significant at 1%, 5%, and 10% level respectively. Robust standard errors are in parentheses.

I use the same instrumental variables strategy for education policy. Table 2.6 shows that once endogeneity is controlled for, the reverse welfare magnet effect is more prevalent. However, the significance level holds only for 2SLS estimates (column 13, 14, and 15). The 2SLS regression shows that a 10 percent increase in public education spending leads to a 4.5 percent reduction in migration flows in average. However, the effects are only marginally significant at 10 percent level. Moreover, the IV-PPML estimate for public education spending per capita is not significant albeit keeping the sign and magnitude correct (column 16). Our instruments seem to perform strongly as shown by the diagnostic statistics. The similar coefficients of public education spending per capita for 2SLS and LIML also enhance our argument that our instruments are strong (column 13 and 14). Therefore, the insignificance of the education policy variable for the IV-PPML is likely to be driven by the exclusion of zero-values dependent variable as well as heteroscedasticity issue.

One explanation about the weak significance of public education spending lies in the fact that most developing countries allocate public spending for primary education. This means that public education spending does not largely affect the people most prone to migrate i.e. children at primary school age are less likely to have the capacity nor the aspiration to migrate. Moreover, one can argue that more generous public education spending could lead to less migration aspirations by the elder members of the household. With better provision of primary education, for instance through free public schools, it may reduce the incentives for the household to send family members abroad. Their calculus of thought would be that given education is now more accessible, the non-monetary costs of being separated with nuclear family members outweigh the potential economic benefit from migration, hence this results in reverse welfare magnet.

The second component is health policy. The importance of health policy as a source of reverse welfare magnet might not be apparent at first. Under the income maximisation framework, public health spending is not a like income maximisation framework, public health spending is not a likely candidate as migration determinant. However, under the reverse welfare magnet hypothesis, public

health spending should be an important factor on migration decision since better provision of public health serves the risk-diversification channel of reverse welfare magnet. It reduces the risk profile faced by households. In addition, greater public health spending per capita influences relative-redistribution of a country.

Table 2.6. Education Policy: Instrumental Variable Regressions

	Estimator	2SLS	LIML	IV-GMM	IV-PPML
	Dependent Variable	Log(Migration)	Log(Migration)	Log(Migration)	Migration
		(13)	(14)	(15)	(16)
Origin	Log Population	1.863***	1.878***	1.841***	0.657
		(0.41)	(0.42)	(0.41)	(1.13)
	Log GDP Per Capita	1.033**	1.055**	1.020**	0.710
		(0.50)	(0.51)	(0.50)	(0.74)
	GDP Growth	0.005*	0.005*	0.004	0.000
		(0.00)	(0.00)	(0.00)	(0.01)
	Log Aid	0.047***	0.047***	0.047***	0.009
		(0.02)	(0.02)	(0.02)	(0.02)
	Quality of Government	-0.383**	-0.379**	-0.383**	-0.476**
		(0.17)	(0.17)	(0.17)	(0.21)
	Democracy$_{(t-1)}$	-0.000	-0.000	-0.001	-0.013
		(0.00)	(0.00)	(0.00)	(0.01)
	Parliamentary System$_{(t-1)}$	0.052	0.054	0.053	0.126
		(0.07)	(0.07)	(0.07)	(0.10)
	Log Public Spending$_{(t-1)}$: Education (Per Capita)	**-0.450***	**-0.460***	**-0.447***	**-0.630**
		(0.23)	**(0.23)**	**(0.23)**	**(0.46)**
Bilateral	Log Distance	-1.310***	-1.310***	-1.309***	-1.447***
		(0.03)	(0.03)	(0.03)	(0.03)
	Common Language	0.915***	0.915***	0.913***	1.120***
		(0.05)	(0.05)	(0.05)	(0.05)
	Colony	1.863***	1.863***	1.862***	1.681***
		(0.08)	(0.08)	(0.08)	(0.09)
	Contiguity	2.712***	2.711***	2.711***	2.225***
		(0.13)	(0.13)	(0.13)	(0.19)
	Constant	YES	YES	YES	YES
	Origin Country Dummies	YES	YES	YES	YES

Destination-Year Dummies	YES	YES	YES	YES
Observations	12673	12673	12673	13296
First stage regression: instruments				
Election Year$_{(t)}$	-0.057***			
	(0.02)			
Election Year$_{(t-1)}$	0.030***			
	(0.01)			
IMF program in effect$_{(t-1)}$	0.084***			
	(0.01)			
Identification statistics:				
Hansen J stat (p-value)	0.336			0.983
Angrist-Pischke chi-sq	90.900			
Angrist-Pischke F stat	30.110			

***, **, * are significant at 1%, 5%, and 10% level respectively. Robust standard errors are in parentheses.

If government spends more money (public health spending) on building new hospital and health facilities, such actions would normally take geographical factors into account. As such, governments would build health facilities in areas that currently do not have one or lacking one. Consequently, greater public health spending, in this case, leads to better access for people to public health facilities which influences their perspective of relative-redistribution i.e. lower geographical relative deprivation. One example is universal health se i.e. lower geographical relative deprivation. Another example is universal health security system that covers basic outpatient provisions for free. Such policy implies that the poorer part of the society now would have access to public health services. This reduces their feelings of relative deprivation through the channel of relative-redistribution.

Table 2.7. displays the regression results for health policy. Unlike education policy in which the PPML regression yield significant coefficients, health policy regressions do not give us any significant coefficient both from OLS or PPML. However, PPML regressions still result in negative coefficients albeit insignificant (column 19 and 20). One potential explanation for this

insignificant is that health policy suffers from a greater degree of endogeneity. As such, instrumental variable strategy becomes more crucial for health policy.

Table 2.7. Health Policy: Baseline Regressions

	Estimator	OLS	OLS	PPML	PPML
	Dependent Variable	Log(Migration+1)	Log(Migration)	Migration	Migration
		(17)	(18)	(19)	(20)
Origin	Log Population	1.218***	1.079***	2.116***	2.125***
		(0.31)	(0.26)	(0.53)	(0.53)
	Log GDP Per Capita	0.134	0.115	1.066***	1.070***
		(0.09)	(0.08)	(0.13)	(0.13)
	GDP Growth	0.003	0.003	0.012**	0.012**
		(0.00)	(0.00)	(0.01)	(0.01)
	Log Aid	0.031*	0.032*	0.001	0.001
		(0.02)	(0.02)	(0.03)	(0.03)
	Quality of Government	-0.587***	-0.588***	-0.290	-0.291
		(0.18)	(0.18)	(0.30)	(0.30)
	Log Public Spending$_{(t-1)}$: Health (Per Capita)	**0.020**	**0.022**	**-0.054**	**-0.053**
		(0.02)	**(0.02)**	**(0.04)**	**(0.04)**
Bilateral	Log Distance	-1.304***	-1.231***	-1.398***	-1.425***
		(0.04)	(0.04)	(0.05)	(0.04)
	Common Language	1.009***	0.914***	1.432***	1.450***
		(0.07)	(0.06)	(0.06)	(0.06)
	Colony	1.833***	1.856***	1.361***	1.360***
		(0.10)	(0.10)	(0.11)	(0.11)
	Contiguity	2.652***	2.793***	3.337***	3.324***
		(0.13)	(0.13)	(0.12)	(0.12)
	Sample	All	Dep.Var. > 0	Dep.Var. > 0	All
	Constant	YES	YES	YES	YES
	Origin Country Dummies	YES	YES	YES	YES
	Destination-Year Dummies	YES	YES	YES	YES
	Observations	13349	12744	12744	13349
	R-Squared	0.68	0.70	0.89	0.89

***, **, * are significant at 1%, 5%, and 10% level respectively. Robust standard errors are in parentheses.

Table 2.8. presents the results for the instrumental variables regressions. Our instruments perform strongly as indicated in the diagnostic statistics. The coefficients of public health spending per

capita between 2SLS (column 21) and LIML (column 22) are not sufficiently different to warrant any worry whether our 2SLS estimates are biased. Interestingly, the public health spending per capita coefficient of IV-PPML estimates is close to unity (column 24). It implies that the effect of health policy through risk-diversification and relative-redistribution is critical in lowering migration flows.

In addition, better public health provisions entail substantial opportunity costs for the citizens of origin (developing) countries. Should they migrate, then they would miss out on the public health provisions. In addition, this argument fits well with the fact that developing countries in the right tail of economic development (more developed ones) are more likely to face greater demand for public health services i.e. more doctors, more hospitals and health facilities, or more nurses. Thus, the relatively large effect of health policy is understandable. The endogeneity issue that occurs in the baseline regressions (table 2.7.) is likely due to unobserved developmental factors that affect both migration flows and public health spending which results in upward bias of the effect of health policy on migration.

Table 2.8. Health Policy: Instrumental Variable Regressions

	Estimator	2SLS	LIML	IV-GMM	IV-PPML
	Dependent Variable	Log(Migration)	Log(Migration)	Log(Migration)	Migration
		(21)	(22)	(23)	(24)
Origin	Log Population	0.662**	0.638*	0.633*	-0.579
		(0.32)	(0.34)	(0.32)	(0.85)
	Log GDP Per Capita	1.236***	1.306***	1.234***	1.107***
		(0.44)	(0.47)	(0.44)	(0.29)
	GDP Growth	0.001	0.001	0.001	-0.006
		(0.00)	(0.00)	(0.00)	(0.00)
	Log Aid	0.123***	0.129***	0.125***	0.121***
		(0.04)	(0.04)	(0.04)	(0.03)
	Quality of Government	-0.531***	-0.530***	-0.527***	-0.409**
		(0.15)	(0.15)	(0.15)	(0.19)
	$Democracy_{(t-1)}$	0.008*	0.008*	0.007*	-0.004
		(0.00)	(0.00)	(0.00)	0.006

	Parliamentary System$_{(t-1)}$	0.327**	0.347**	0.332**	0.494***
		(0.14)	(0.15)	(0.14)	(0.14)
	Log Public Spending$_{(t-1)}$: Health (Per Capita)	**-0.707****	**-0.753****	**-0.714****	**-1.013*****
		(0.29)	**(0.32)**	**(0.29)**	**(0.36)**
Bilateral	Log Distance	-1.321***	-1.322***	-1.321***	-1.470***
		(0.03)	(0.03)	(0.03)	(0.03)
	Common Language	0.926***	0.927***	0.924***	1.117***
		(0.05)	(0.05)	(0.05)	(0.05)
	Colony	1.882***	1.884***	1.882***	1.746***
		(0.08)	(0.08)	(0.08)	(0.09)
	Contiguity	2.611***	2.604***	2.609***	1.852***
		(0.15)	(0.16)	(0.15)	(0.22)
	Constant	YES	YES	YES	YES
	Origin Country Dummies	YES	YES	YES	YES
	Destination-Year Dummies	YES	YES	YES	YES
	Observations	12441	12441	12441	13018
	First stage regression: instruments				
	Election Year$_{(t)}$	-0.054***			
		(0.02)			
	Election Year$_{(t-1)}$	0.018			
		(0.01)			
	IMF program in effect$_{(t-1)}$	0.066***			
		(0.01)			
	Identification statistics:				
	Hansen J stat (p-value)	0.336			0.768
	Angrist-Pischke chi-sq	50.150			
	Angrist-Pischke F stat	16.610			

***, **, * are significant at 1%, 5%, and 10% level respectively. Robust standard errors are in parentheses.

The final component of social policy is social protection. For less developed countries, social protection is less prevalent given their lack of financial resources. On the other hand, developing countries in the lower stratum may have highly developed social protection schemes. Unsurprisingly, our full sample shows that social protection per capita has the highest standard deviation among the three components of social policy which indicates the varying degree of social protection schemes within developing countries (table 2.1.).

In theory, the presence of comprehensive social protection should act as deterrent for growing migration aspirations. This is especially true in the risk-diversification framework of migration motive. Should the citizens in origin countries view that the social protection schemes in their countries provide sufficient protection for volatile or adverse period of their life, it could lead to lower migration aspiration. That being said, since the majority of less developed countries tend to lack in comprehensive social protection, the reverse welfare magnet effect stemming from social protection could be weakly present in average effect.

Table 2.9. depicts the regressions results for social protection variable. In contrast with education and health policy regressions, the coefficients for social protection per capita are consistently negative across different estimations. Only PPML estimations that yield significant, albeit weakly, effects of migration-reducing due to social protection (column 27 and 28). Similar to the other components of social policy, the magnitude of the reverse welfare magnet as estimated by PPML is quite small.

Table 2.9. Social Protection: Baseline Regressions

	Estimator	OLS	OLS	PPML	PPML
	Dependent Variable	Log(Migration+1)	Log(Migration)	Migration	Migration
		(25)	(26)	(27)	(28)
Origin	Log Population	1.422***	1.256***	2.122***	2.128***
		(0.31)	(0.26)	(0.51)	(0.51)
	Log GDP Per Capita	0.079	0.054	1.101***	1.106***
		(0.09)	(0.07)	(0.15)	(0.15)
	GDP Growth	0.004	0.004	0.014***	0.014***
		(0.00)	(0.00)	(0.01)	(0.01)
	Log Aid	0.031*	0.032*	0.001	0.002
		(0.02)	(0.02)	(0.03)	(0.03)
	Quality of Government	-0.643***	-0.667***	-0.490	-0.494
		(0.19)	(0.19)	(0.31)	(0.31)
	Log Public Spending$_{(t-1)}$: Social Protection (Per Capita)	**-0.011**	**-0.009**	**-0.042***	**-0.042***
		(0.01)	**(0.01)**	**(0.02)**	**(0.02)**

Bilateral	Log Distance	-1.294***	-1.227***	-1.380***	-1.407***
		(0.04)	(0.04)	(0.05)	(0.04)
	Common Language	1.019***	0.914***	1.441***	1.460***
		(0.06)	(0.06)	(0.06)	(0.06)
	Colony	1.837***	1.865***	1.345***	1.343***
		(0.10)	(0.10)	(0.11)	(0.11)
	Contiguity	2.678***	2.817***	3.387***	3.374***
		(0.13)	(0.13)	(0.12)	(0.12)
	Sample	All	Dep.Var. > 0	Dep.Var. > 0	All
	Constant	YES	YES	YES	YES
	Origin Country Dummies	YES	YES	YES	YES
	Destination-Year Dummies	YES	YES	YES	YES
	Observations	13473	12833	12833	13473
	R-Squared	0.68	0.69	0.89	0.89

***, **, * are significant at 1%, 5%, and 10% level respectively. Robust standard errors are in parentheses.

Table 2.10. shows the instrumental variables regressions for social protection. Unlike other social policy components, for social protection regressions, our instruments seem to be rather weak. As shown in column 29, Although the 2SLS passes the under-identification test with the Angrist-Pischke chi square value of 11.26, the low value given by the Angrist-Pischke F stat (3.73) indicates that our 2SLS estimations are prone to poor performance. This indication is further enhanced when we compare 2SLS (column 29) and LIML (column 30) results for social protection per capita variable. 2SLS regression yields -0.427 whereas LIML gives us -0.549. These two values are considerably different, hence further strengthens the claim of weak-instrument problem for the social protection per capita regressions. Moreover, none of the coefficients of social protection per capita variable in 2SLS, LIML, and IV-GMM appears to be statistically significant. Nevertheless, if we ignore the potential issue of weak-instrument variable and opt to estimate the IV-PPML regression (column 32), we find support for reverse welfare magnet hypothesis through the social protection channel. Based on the IV-PPML model, it is estimated that a 10 percent increase in social protection per capita leads to a 5.39 percent reduction in migration flows in average. Certainly, given the suspicion of weak-instrument issue in the traditional 2SLS estimates, one should carefully interpret such result.

Table 2.10. Social Protection: Instrumental Variable Regressions

	Estimator	2SLS	LIML	IV-GMM	IV-PPML
	Dependent Variable	Log(Migration)	Log(Migration)	Log(Migration)	Migration
		(29)	(30)	(31)	(32)
Origin	Log Population	0.803*	0.662	0.809*	-0.154
		(0.45)	(0.57)	(0.45)	(0.972)
	Log GDP Per Capita	0.955	1.218	0.930	0.770
		(0.67)	(0.91)	(0.67)	(0.577)
	GDP Growth	0.004	0.004	0.004	0.001
		(0.00)	(0.00)	(0.00)	(0.00)
	Log Aid	-0.017	-0.033	-0.015	-0.055**
		(0.04)	(0.06)	(0.04)	(0.03)
	Quality of Government	-1.074***	-1.211**	-1.065***	-1.299***
		(0.38)	(0.50)	(0.38)	(0.27)
	Democracy$_{(t-1)}$	-0.001	-0.001	-0.001	-0.008
		(0.00)	(0.00)	(0.00)	(0.01)
	Parliamentary System$_{(t-1)}$	-0.053	-0.068	-0.050	-0.009
		(0.06)	(0.07)	(0.06)	(0.07)
	Log Public Spending$_{(t-1)}$: Social Protection (Per Capita)	**-0.427**	**-0.549**	**-0.415**	**-0.539****
		(0.31)	**(0.42)**	**(0.31)**	**(0.21)**
Bilateral	Log Distance	-1.309***	-1.314***	-1.309***	-1.459***
		(0.03)	(0.03)	(0.03)	(0.03)
	Common Language	0.924***	0.929***	0.924***	1.159***
		(0.05)	(0.05)	(0.05)	(0.05)
	Colony	1.872***	1.874***	1.870***	1.715***
		(0.08)	(0.08)	(0.08)	(0.10)
	Contiguity	2.775***	2.782***	2.777***	2.644***
		(0.16)	(0.17)	(0.16)	(0.24)
	Constant	YES	YES	YES	YES
	Origin Country Dummies	YES	YES	YES	YES
	Destination-Year Dummies	YES	YES	YES	YES
	Observations	12528	12528	12528	13142
	First stage regression: instruments				
	Election Year$_{(t)}$	-0.060**			
		(0.03)			
	Election Year$_{(t-1)}$	0.008			

	(0.02)	
IMF program in effect$_{(t-1)}$	0.059**	
	(0.02)	
Identification statistics:		
Hansen J stat (p-value)	0.193	0.935
Angrist-Pischke chi-sq	11.260	
Angrist-Pischke F stat	3.730	

***, **, * are significant at 1%, 5%, and 10% level respectively. Robust standard errors are in parentheses.

5. Conclusions

This paper proposes a novel concept of 'reverse welfare magnet'. The central argument being that people tend to look not only to income maximisation but also risk minimisation. Social policy functions as a tool that minimises the risk profile faced by individuals and households which eventually influences migration aspiration. The presence of welfare magnet is caused by two mechanisms: (i) risk-diversification, and (ii) relative-redistribution. Regarding the former, social policy fills in the risk-diversification needs of individuals and households so that migration as a risk-diversification strategy is less attractive. Meanwhile the latter is closely associated to the relative deprivation concept introduced by NELM. That being said, social protection lowers migration aspiration since it lowers the feelings of relative deprivation through relative-redistribution.

The concept of reverse welfare magnet hypothesis is then empirically tested by conducting gravity model using bilateral migration flows as the dependent variable. Traditional OLS models yield biased estimates of the effect of social policy in developing countries on migration flows. Meanwhile, PPML models correct for heteroscedasticity problem and give results in support of the reverse welfare magnet hypothesis. Due to potential endogeneity problem, instrumental variable regressions are conducted to further disentangle the causality argument of reverse welfare magnet. I find an overwhelmingly strong evidence of reverse welfare magnet. It is estimated that a 10 percent increase of general social policy per capita should lead to a 7.75 percent of reduction in migration flows in general. Further examination of each component of social policy (education,

health, and social protection) further corroborates the reverse welfare magnet hypothesis albeit with different degree of significance levels.

The policy implication of our findings is straightforward. Growing capability, as argued by the aspiration-capability framework, could lead to higher migration aspirations. Hence, development would not stop migration. However, by applying the risk-minimisation perspective, this paper shows that policies which reduce the risks profile of its citizens could be effective to lower migration aspiration. Social policy, as a central policy tool which functions as a risk-minimisation mechanism, provides the potential bullet in managing the level of South-North migration. A comprehensive social policy framework in education, health, and social protection in developing countries could be key in the management of global migration.

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Appendix 1

List of Destination Countries (N=19)

Country Name	Freq.	Percent
Australia	2,115	8.11
Austria	820	3.14
Belgium	727	2.79
Canada	2,072	7.95
Czech Republic	444	1.70
Denmark	370	1.42
Finland	1,475	5.66
France	293	1.12
Germany	1,757	6.74
Iceland	1,002	3.84
Italy	1,467	5.63
Netherlands	1,949	7.47
New Zealand	2,114	8.11
Norway	1,958	7.51
Slovakia	631	2.42
Spain	1,693	6.49
Sweden	1,101	4.22
Switzerland	2,019	7.74
United States of America	2,071	7.94

Appendix 2

List of Origin Countries
(N=102)

Country Name	Freq.	Percent	Country Name	Freq.	Percent	Country Name	Freq.	Percent
Afghanistan	141	0.54	Fiji	90	0.35	Nepal	226	0.87
Albania	264	1.01	Gambia	282	1.08	Niger	254	0.97
Algeria	328	1.26	Georgia	210	0.81	Nigeria	174	0.67
Angola	313	1.20	Ghana	264	1.01	Pakistan	5	0.02
Argentina	346	1.33	Grenada	231	0.89	Panama	294	1.13
Azerbaijan	214	0.82	Guatemala	291	1.12	Papua New Guinea	245	0.94
Bahamas	250	0.96	Guinea-Bissau	173	0.66	Paraguay	286	1.10
Bangladesh	249	0.95	Hungary	380	1.46	Peru	342	1.31
Barbados	253	0.97	India	360	1.38	Philippines	283	1.09
Belarus	228	0.87	Indonesia	342	1.31	Poland	314	1.20
Belize	249	0.95	Iran, Islamic Republic of	305	1.17	Romania	349	1.34
Benin	291	1.12	Jamaica	302	1.16	Russian Federation	271	1.04
Bolivia	313	1.20	Kazakhstan	243	0.93	Rwanda	182	0.70
Botswana	266	1.02	Kenya	325	1.25	Senegal	331	1.27
Brazil	311	1.19	Korea, Republic of	327	1.25	Sierra Leone	260	1.00
Bulgaria	278	1.07	Kyrgyzstan	225	0.86	South Africa	362	1.39
Burkina Faso	219	0.84	Latvia	245	0.94	Sri Lanka	327	1.25
Burundi	122	0.47	Lebanon	252	0.97	Syrian Arab Republic	346	1.33
Cameroon	331	1.27	Lesotho	118	0.45	Tanzania, United Republic of	309	1.18
Cape Verde	284	1.09	Liberia	164	0.63	Thailand	293	1.12
Central African Republic	181	0.69	Lithuania	247	0.95	Togo	254	0.97
Chile	378	1.45	Madagascar	271	1.04	Trinidad and Tobago	282	1.08
China	359	1.38	Malawi	196	0.75	Tunisia	303	1.16
Colombia	345	1.32	Malaysia	6	0.02	Turkey	374	1.43

Congo	218	0.84	Maldives	224	0.86	Uganda	197	0.76
Costa Rica	310	1.19	Mali	291	1.12	Ukraine	253	0.97
Cote d'Ivoire	299	1.15	Malta	288	1.10	United Arab Emirates	277	1.06
Croatia	262	1.00	Mauritius	318	1.22	Uruguay	306	1.17
Dominican Republic	322	1.23	Mexico	344	1.32	Vanuatu	201	0.77
Ecuador	168	0.64	Moldova, Republic of	238	0.91	Venezuela	332	1.27
Egypt	356	1.37	Mongolia	236	0.90	Viet Nam	6	0.02
El Salvador	296	1.14	Mozambique	202	0.77	Yemen	6	0.02
Equatorial Guinea	236	0.90	Myanmar	32	0.12	Zambia	297	1.14
Ethiopia	3	0.01	Namibia	245	0.94	Zimbabwe	287	1.10

Chapter 3

Financial Constraints, Social Policy, and Migration: Evidence from Indonesia

1. Introduction

Empirical research on social policy as migration determinant has largely focused on how destination countries' welfare state shapes migration flows from sending countries.[19] Since the seminal work of Borjas (1999) who coins the term 'welfare magnet', there have been a substantial number of studies that look into the interplay between welfare state and immigration (Giulietti and Wahba, 2012). The majority of these studies, nonetheless, have strikingly placed more emphasis on the impact of immigration on the welfare state (Nannestad, 2007).

Meanwhile, sending countries' perspectives are generally overlooked. This negligence is even more apparent in the topic of sending countries' social policy and its impact on migration. Indeed, it is well known that governments of developing countries have limited resources to provide universal social policy such as health and education infrastructure. Hence, the often-absent welfare state system in developing countries is likely the cause of the relatively missing literature in developing countries' social policy as migration determinants so far. If the welfare state of receiving countries is an important variable that influences migration, then the welfare regime and social policy in developing countries, in theory, should be equally influential or at least play a substantial role as well.

This paper's major research question is how social policy and financial constraints affect migration decisions? To get a comprehensive answer, I break down this question into three sub-questions.

[19] In the welfare state and immigration literature, sending and receiving countries are defined as developing economies and advanced economies, respectively. Therefore, the migration flow analysis is typically defined as 'South-North' migration.

First, how do different types of social policy affect migration? That is, I attempt to disentangle effects of social protection (direct social policy) and quasi-public goods provision (universal social policy) on different migration types: internal and international. The former is further explored by conducting a causal-impact identification exercise. Second, does a households' poverty profile influence the migration decision of social protection beneficiaries? More specifically, I assess whether multidimensionally deprived households who are beneficiaries of social protection have a different behaviour in migration decision compared to beneficiaries who are not multidimensionally deprived. Third, does the severity of a household's financial constraint affect internal and international migration differently?

In the last decade there has been a global trend in the implementation of direct social policy through social protection by the governments of developing countries (Hanlon et al., 2010; Ghosh, 2011). International development agencies have been actively promoting the use of social protection, especially cash transfers, as a critical development strategy to alleviate poverty (Hanlon et al., 2010; Garcia and Moore, 2012). This global trend has been enhanced by the constantly evolving methods in impact evaluation that are applied to evaluate policy intervention (Imbens and Wooldridge, 2009).

There have been quite a few empirical studies that assess the effect of social protection on migration (Hagen-Zanker and Himmelstine, 2013). Nevertheless, most of these studies do not address causality in their empirical analyses (Kabeer, 2012). Notable exceptions are Stecklov et al. (2005) and Angelucci (2004, 2014) who use Mexico's *Progresa* program data to analyse the impact of conditional cash transfers (CCT) on migration. The experimental nature of *Progresa* makes it easier to conduct an impact evaluation approach. However, their findings show conflicting results.

There are three research gaps related to the effect of social policy on migration this paper tries to address. First, there has been no systematic empirical study that investigates the impact of unconditional cash transfers (UCT) on migration, which in theory give households more freedom

in deciding their allocation. In this paper, I employ an impact evaluation strategy on non-experimental (observational) data in which limited causality claim could be inferred. Second, studies on the impact of social protection on migration have focused mostly on Latin American countries, especially Mexico. Indonesia has a strong internal migration culture and international migration has been a surging phenomenon.[20] The temporary UCT policy intervention in 2005 thus, makes Indonesia, as a large non-Latin American country, an excellent case to study. Third, this paper fills the literature gap on the role of social policy as contextual variable in sending countries on migration decisions. The multilevel structure of the empirical analysis in the second part of this paper allows us to examine how developing countries' universal social policy in education and health correlate with households' migration decisions.

In this paper, I introduce a hybrid concept of financial constraint that incorporates two exogenous factors i.e. social policy and access to finance, and look at how it affects migration decision. To do so, I incorporate the financial constraint concept from the household finance literature which emphasises access to finance, and extend its framework to also incorporate social policy interventions. I also rely on the new economic of labour migration (NELM) perspective and Amartya Sen's capability concept.[21] Thus, this paper theoretically contributes to the migration literature by combining financial constraints, social policy, and access to finance in an integrated framework that affects migration.

This paper also contributes in bridging internal migration and international migration in an integrated analysis. King and Skeldon (2010) argue for the great potentials of integrating internal and international migration at both the theoretical and empirical studies. Many studies have

[20] Farre and Fasani (2013) show that internal migration is an important and long-lasting phenomenon in Indonesia while Czaika and de Haas (2014) find that Indonesia is an important country of origin in absolute term.
[21] One of the NELM concepts is related to the availability of the credit market for households i.e. access to finance, in which households' migration strategies are affected (Taylor, 1999) whereas the capability approach is more related to the capability of households to migrate (de Haas, 2010). I argue, which I further elaborate in the following section, that exogeneous positive financial shocks due to better access to finance or social transfers affect the capability of households, which eventually influence their migration decisions.

focused in either internal migration or international migration. Although in general the determinants of these two migration types are similar, the magnitude and direction could be different. First, international migration often includes border control as intervening variable whereas internal migration normally implies free migration regime. Furthermore, financial constraints could be a more binding factor for international migration, which is often costlier, compared to internal migration.[22] Hence, a simultaneous analysis of internal and international migration should give a more comprehensive picture of migration determinants

The paper is structured as the following. I start by discussing the concepts of financial constraints and social policy used in this paper and how they relate to migration. Then I provide a brief tour on Indonesia's migration profile as well as its state of social policy, with the emphasis on the UCT program as the policy intervention analysed in the empirical section. Finally, I present the data and econometric models used in the empirical analysis and discuss the results.

2. Theory

Financial Constraints and Migration

How do we define financial constraints? There have been some attempts to define financial constraints.[23] One definition states that households or individuals face financial constraints when cash-on-hand is low and limited (Carroll, 2001). Alternatively, financial constraint is defined as the situation in which individuals or households have their request for credit rejected by financial institutions (Jappelli, 1990). Given the interchangeability of credit and liquidity constraints, it is plausible to contend that individuals or households that are either short in cash (Carroll, 2001; La

[22] International migration usually comes with higher costs, both monetary costs and non-monetary costs such as the psychological cost of rarely meeting family and relatives and home.
[23] These definitions are based on the 'household finance' literature.

Cava and Simon, 2005) or unable to borrow from financial institutions (Jappelli, 1990; Duca and Rosenthal, 1993) are financially-constrained.

The role of financial constraints constitutes an often-overlooked dimension in the analysis of migration determinants as well as in the development-migration debate. Traditional neoclassical theory of migration holds that people migrate when the benefits of migrating exceed the costs (Harris and Todaro, 1970). However, financial constraints could prevent someone from migrating even in the presence of positive net benefit from migration (Angelucci, 2012, 2014). Some exceptions are studies which view the interplay between financial constraints and migration from the perspective of income shocks (Bazzi, 2014; Angelucci, 2014). Financially constrained individuals and households often cannot migrate despite the presence of large wage gap. Migration as a risk-diversification strategy to insure against income shocks, one of NELM main arguments, puts financial constraints in an important position in migration research (Stark and Bloom, 1985; Taylor, 1999; de Haas, 2010).

There has also been a lack of specific attempts to combine financial constraints with exogenous policy interventions or contextual factors affecting migration. One exception is the recent attempt to integrate financial constraints in the analysis of how social protection affects migration decisions in Mexico (Angelucci, 2014). However, an integrated concept of financial constraints that takes into account other factors to influence migration decision, and is not merely viewed as an independent positive income shock, is still absent.

The observation by Hatton and Williamson (1998) of a non-linear, inverted-U curve relationship between emigration rates and national income using the historical data from Europe suggests the binding effect of financial constraints on migration. Typically, the poorest members of the society can neither use their own savings to finance migration nor borrow funds from external sources because they lack the collateral to borrow against (Angelucci, 2012).

A more contemporary migration theory, the NELM, proposed by Stark and Bloom (1985) offers a different entry point, different unit of analyses, and a richer set of explanations for migration decisions. First, NELM acknowledges that migration decision making typically does not happen at an isolated individual level but involve larger units i.e. households (Stark and Levhari, 1982; Stark, 1984; Katz and Stark, 1986). Second, an important contribution of NELM is that it takes into account the role of financial constraints. Taylor (1999) summarizes that under the NELM, the decision to migrate is part of family strategies:

(i) to insure against income and production risks;

(ii) to obtain funds for investing in new activities;

(iii) to raise income.

This implies that migration is a way-out strategy if one cannot secure funds to invest in economic activities –a function that should normally be provided by financial institutions through credit disbursement. In addition, NELM argues that migration is a strategy to insure against economic shocks –a function that ideally should be provided by the well-working financial or public sector through welfare programs. Therefore, NELM predicts that financial constraints have a positive effect on migration (Phan, 2012).

NELM provides a theoretical grounding in which migration may result as a strategy to overcome credit constraints due to imperfect or missing credit markets or lack of welfare state provision from the government. The question is then how would better provision of credit markets and welfare programs affect migration? Would households still use migration as a strategy if such conditions occur?

The loosening of financial constraints does not necessarily imply that people will end up migrating. If imperfections in credit markets are significantly reduced, people may decide not to migrate

because they have larger probabilities to acquire capital and diversify risks at home. According to NELM, migration incentives shall be reduced if credit markets function better and people could obtain credits more easily. Thus, under the NELM framework, a relaxation of financial constraint such as more accessible credit markets (Phan, 2012) or receiving transfers (Angelucci, 2012, 2014) would lead to less migration.

A more inclusive and well-functioning credit market is a signal for better economic opportunities and investment conditions at home. Hence, one may decide not to migrate, and opt for relishing the opportunity to reap benefits from the wider economic opportunity at home. Financial constraints, caused by lack of access to finance, are still a burgeoning problem in developing countries. World Bank estimates show that only one of two adults worldwide have an account at a formal financial institution and only 9 percent have taken a loan from a financial institution (Demirguc-Kunt and Klapper, 2012).

A contrasting perspective is offered by the capability approach. The theory of capability approach is initially proposed by Sen (1980) in which he argues that 'social arrangements should be evaluated according to the extent of freedom people have to promote or achieve objectives they value' (Alkire, 2002). Robeyns (2005) defines the capability approach as 'a broad normative framework for the evaluation and assessment of individual well-being and social arrangements, the design of policies, and proposals about social change in society'. Under the capability approach, freedom is regarded as the most basic aspect of human life and that well-being is assessed 'in terms of what they are able to be or do should they choose so' (Deneulin, 2006). The broad nature of the capability approach framework results in the broad application of its concept. Its application ranges from its natural habitat of welfare economics and development economics to philosophy or social policy.

How to apply the capability approach to migration? de Haas (2010) presents the concepts of 'aspiration to migrate' and 'capability to migrate' drawing from Sen's capability approach.[24] He argues that the propensity of someone to migrate is the function of one's aspirations and capabilities to migrate. These properties are determined by the local livelihood activities. The capability approach model of migration predicts that migration shall consistently increase so long as aspirations to migrate increase faster than opportunities at home i.e. local livelihood development

I contend that the application of the capability approach in migration implies that people may have different functionings.[25] Some people may value their current location more than others. In such scenario, relaxation of financial constraints, under the capability framework, does not necessarily lead to less migration as predicted by NELM. In other words, the loosening financial constraints could lead to both directions as the following scenarios explain more clearly:[26]

- If staying home (at region of origin) is seen as part of functionings, then financial constraints relaxation would lead to less migration because one would use the extra capability to pursue other functionings that do not require her to migrate such as opening new businesses, buying household utilities, or increasing current consumption. This is in line with NELM prediction.

[24] Carling (2002) introduces at first an 'aspiration/ability' model which is similar to the capability approach. However, his model does not refer to Amartya Sen's work.

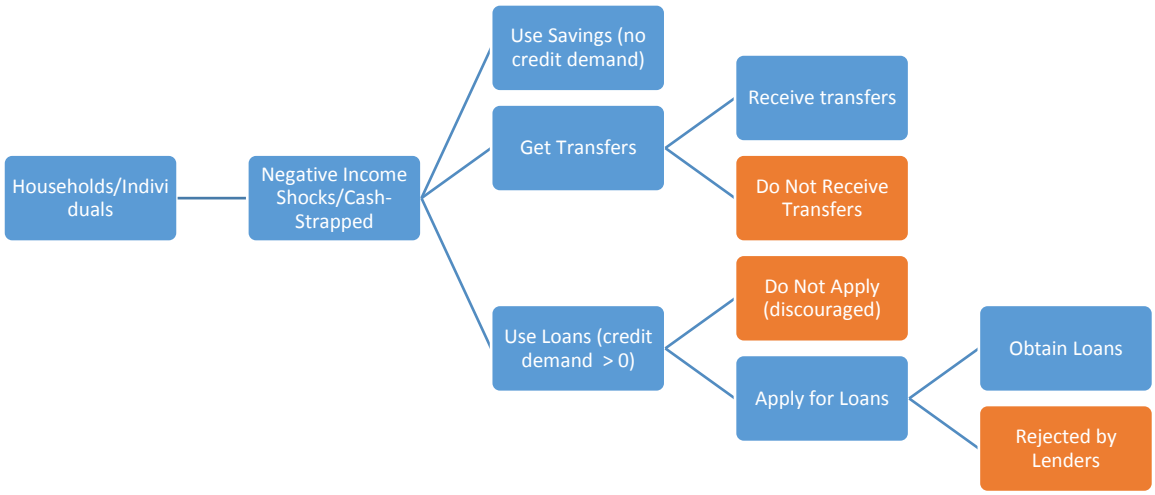
[25] Functioning is a unique concept in the capability approach defined as 'the various things a person may value doing or being' (Sen, 1999). Examples of functioning are being healthy, being well-nourished, and being able to move freely/mobile (Sen, 1992; Kuklys, 2010).

[26] An alternative third explanation is that financial constraints relaxation increases the capability to migrate but can also simultaneously decrease migration incentives due to narrower opportunity gaps between home and other potential migration destinations. Therefore, the aggregate impact of financial constraints relaxation on migration decision depends on which effect is stronger and which factors increases or decreases faster under particular stages of development.

- However, if mobility is regarded as part of functionings, then financial constraints relaxation would lead to more migration because one would use the additional capability (freedom) to finance migration.

In this paper, I integrate the NELM and capability approach to incorporate financial constraints and eventual migration decision. To get a clearer picture on the operationalization of financial constraints in this paper, I use a multi-stage decision process framework (figure 3.1.). The decision tree framework shows that when individuals or households face a cash-strapped condition, for example due to negative income shocks, they have three options to finance their economic activities. The first option is to use internal sources. That is to take out their savings. By utilising their savings, they avoid financial constraints. The second avenue is transfers. These can come from formal channels such as governments' cash transfers or from informal ones like family, neighbours, or friends (extended social network). If they receive such financial assistance, they are not financially constrained whereas failing to secure transfers means they face financial constraints. The third option is to secure a loan. Normally, these come from financial institutions.

Figure 3.1. Individual/Household Decision Process and Financial Constraints



Source: Author's own, elaborated from Chen and Chivakul (2008)

However, cash-strapped individuals and households may decide not to apply for loans. One of the reasons could be due to a lack of collateral to borrow against that discourages them to apply or due to fear for payment default, so that they become discouraged lenders. For those who opt for applying for loans, there are two possible outcomes: obtain the loans successfully or get rejected by lenders. In the latter case, it means they face severe financial constraints. In summary, figure 3.1 provides a hybrid concept of financial constraints which integrates social policy and access to finance. Moreover, it allows us to construct a measure of households' access to finance which is used in the empirical analysis.

Social Policy and Migration: A Developing Country Perspective

Social policy has been defined as 'the policies which governments use for welfare and social protection' (Spicker, 2014). In this paper, I classify social policy into two big typologies: universal social policy (quasi-public goods) and targeted social policy (social protection). Social policy in developing countries is unique in contrast with advanced liberal democracies i.e. welfare state concept. The governments of developing countries often have to face inadequate financial capacities to run universal social policy like in advanced economies. Part of the reason is due to the much narrower tax-payers base available in developing countries –typically attributed to the high level of informal economic activities and shadow economy. Therefore, the welfare state typology of Esping-Andersen (1990) is not suitable for social policy analysis in developing countries.

Gough (2004) argues that 'welfare regime' is a more potent concept for social policy analysis of developing countries instead of 'welfare state'. Livelihood (in)security is a focal term for welfare regimes analysis of developing countries. This is why targeted social policy programs (social protection) with the goal to increase human development level is critical in every social policy programs of developing countries.

Barrientos (2013) classifies social protection programs in developing countries into three categories:

1. Pure income transfers

2. Income transfers combined with asset accumulation

3. Integrated poverty reduction programmes

Pure income transfers are specifically targeted cash transfers for poor households. They can target all eligible households or categories of individuals such as elderly people, orphans, and people with disabilities. The second category, income transfers combined with asset accumulation, could be cash or in-kind transfers which also encourage and facilitate asset accumulation by the members of households. The 'asset' includes physical, financial, and human assets. The third category, integrated poverty reduction programmes, is the latest innovation of social policy programs which is eclectic in principle, combining various interventions to tackle social exclusion and focusing on the poorest.

The theory of social transfers has long virtue the superior efficiency of cash transfers over in-kind transfers (Currie and Gahvari, 2008). However, household-heads may not follow presupposed rational actions on how to spend the funds they receive. Instead of investing for the future by increasing their households' expenditure for health, education, or nutrition, it is not uncommon to find heads of households spend the extra cash in-hand rather unwisely, such as increasing the consumption level of cigarettes or buying unnecessary tertiary goods. Hence, such 'irrational' decisions taken by households are often considered as the root cause for the ineffectiveness of targeted social policy programs in the form of cash transfers.

Conditional cash transfers (CCT) has been initiated to address such criticism. The launch of Mexico's *Progresa* in 1997–which has been called *Opportunidades* later on- and in a smaller scale *Bolsa*

Escola in Brazil's Federal State, was a landmark in the new social protection global agenda. Policy makers have started to realise the potentials of targeted social programs to complement broad-based traditional social policy of quasi-public goods provision such as health and education infrastructure. CCT is a cash transfer program that adds the dimension of responsibility upon it. In other words, the cash transfers come with conditions. CCT programs soon have become a global trend, in which it allows countries to tailor their own programs with varying focus, depending on the needs of each country yet at the same provides the potential for greater degree of effectiveness. CCT programs are not specifically designed for managing migration incentives. However, researchers can analyse the impact of such programs on migration and mobility (Sana and Massey, 2000; Angelucci, 2004; Stecklov et al., 2005).

The impact of cash transfers largely depends on how households analyse the income and substitution effect of these additional income. In order for cash transfers to have positive impact on migration, the income effect of cash transfer should be greater than its substitution effect. Conversely, if the substitution effect of cash transfer is greater than its income effect, cash transfer is more likely to post negative effect on migration. Since social protection such as cash transfers acts as extra income, it could increase the propensity for migration through the financial constraint relaxation channel (Angelucci, 2012, 2014; Phan, 2012). This is the case in which income effect dominates. However, if households perceive cash transfers to reducing net benefit of migration, the effect is negative (Stecklov, 2005). This is the case where substitution effect dominates.

The type of social protection thus matters for migration decisions (Hagen-Zanker and Himmelstine, 2013). Unconditional cash transfer is likely to be viewed as an exogenous extra income, which either could be used to finance migration for extra insurance for the households (Angelucci, 2004, 2014) or be viewed as substitute for migration (Stecklov, 2005). In addition, the effect of social protection also depends on the types of migration. Internal migration, which is

cheaper, is likely to be chosen over international migration if the magnitude of financial constraints relaxation from cash transfers is marginal (Stecklov, 2005; Angelucci, 2014).

CCT comes with conditions. Since these conditions are typically linked to health or educational dimensions such as immunisation and school attendance, the effect of CCT on migration can go both ways (Hagen-Zanker and Himmelstine, 2013). Households may regard CCT as substitutes for migration in which households no longer view migration as necessary to diversify risk. Furthermore, the attached condition to receiving CCT may make households not able to send family members for migration. Hence in this case, CCT reduces migration propensity. On the other hand, the extra income gained from CCT could also be viewed as a medium that relaxes financial constraints in which households could use the extra funds to finance migration. In this case, CCT increases migration propensity.

Unconditional cash transfers (UCT) comes with no conditions attached to the fund. Therefore, it is more likely that households perceive this additional income to providing some relief from financial constraints. There are several options available for households in the allocation of these UCT money. First, households can save the UCT money to smooth consumption in the event of income shocks. Alternatively, they can use it to finance productive activities or immediate consumption. In these cases, the effect of UCT on migration is likely to be zero. However, households can also decide to use the extra income from UCT to finance the migration of a family member, either by using the UCT directly or by spending the UCT for consumption so that they can save more fraction of their regular income (Angelucci, 2014). In this scenario, households basically allocate the money to further raise their insurance against potential future income shocks by sending family members to migrate.

In theory, UCT should provide larger incentives to be used for financing migration because households do not have to adhere to any conditions attached to the funds. Also, it is likely that UCT has a larger financial constraints relaxation effect that could increase international migration

for household beneficiaries who are not at the bottom of the income distribution. On the other hand, for the poorest beneficiaries, UCT may not be sufficient to finance international migration because the financial constraints relaxation effect is not large enough (Angelucci, 2012). Meanwhile for internal migration, due to its less expensive nature, if the income effect of UCT dominates, then it is plausible to predict that UCT leads to more internal migration.

Many empirical studies have focused on evaluating the impact of CCT on migration (Hagen-Zanker and Himmelstine, 2013). In contrast, empirical studies on the effect of UCT are nearly absent and the limited existing studies find mixed results. Deshingkar et al. (2013) find no significant impact of UCT scheme in Kenya, Tanzania, and Malawi while non-contributory pension in South Africa (age-targeted UCT) is associated with increased migration (Posel et al., 2006).

The problem with existing impact analyses of directed social policy on migration is the lack of counterfactuals. Rare exceptions are Angelucci (2004, 2014) and Stecklov et.al. (2005). They investigate the effect of CCT on Mexico-US migration using impact evaluation approach. Interestingly, they find conflicting results amidst the use of the same policy intervention as the centre of their analyses (*Progresa* program). Angelucci (2004), conducting the analysis at individual level, finds that CCT increases international migration (Mexico-US) migration. CCT is also found to have a greater influence in poorer households, who are more likely to face more binding constraints, by increasing migration incentives through the relaxation of financial constraints (Angelucci, 2014). In contrast, Stecklov et al. (2005), using household level data, find that CCT reduce Mexico-US migration. They argue that since cash transfers provide extra income for households, the net benefit of migration declines and thus reduces the propensity to migrate internationally. Such differences in results and findings of the same policy intervention may be due to the different level of unit of analysis (individual vs household) as well as the sample chosen.

Nevertheless, these conflicting findings show that the directions of the impact of cash transfers on migration decision are not straightforward.

3. Migration and Social Policy in Indonesia

Migration in Indonesia

Indonesian workers migrate internationally mainly for economic reasons. Working as labour migrants abroad means improving the chance to quadruple individual income (table 3.1.). Households who want to maximise income may consider that sending family members abroad as migrant workers to be an optimal strategy. Such incentive could be even greater given the relatively weak exchange rate of the national currency (rupiah) which translates to higher remittances received at home. Therefore, sending family members abroad as labour migrants could result in potentially much higher income for households in addition to risk diversification against adverse or negative income shocks.

Table 3.1. Indonesian Migrant Workers Abroad: Estimated Wage and Fees

Type of Income/Spending	Amount (in US$)
Estimated wage in Indonesia for informal worker	600/year
Estimated wage abroad for similar job	1300-5400/year
Recruitment fees	800-1400

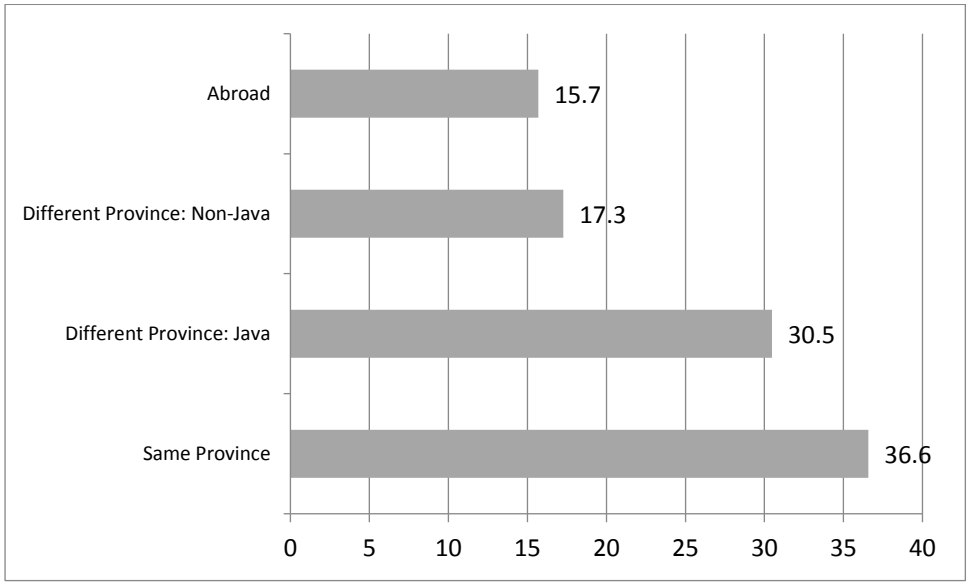
Source: Bank Indonesia, 2008

Interestingly, despite the presence of such relatively strong pull factor for Indonesians to migrate abroad, the Indonesian migration history has been more about internal migration instead of international migration. The Government of Indonesia has been pro-active promoting internal migration through a program called *Transmigrasi* since the 1950s with the objective to reduce the population density of Java (the most densely populated island) to outer islands (Hardjono, 1988; Farre and Fasani, 2013). As the Indonesian economy developed during the New Order era (1966-1998) and that the new democratic era begun post-1998, international migration became more

prevalent. However, the path dependence of the *Transmigrasi* program still lingers as the bulk of Indonesian migration is still internal (Ducanes and Abella, 2009).

Figure 3.2. displays the distribution of migration destinations of this paper's sample data for 2007-2008. Only 15.7 percent of labour migration in our sample is international. Financial constraints might provide an explanation for this pattern. Short-distance migration that takes place within a province dominates (36.6 percent). As our empirical exercise later shows, these are mostly related to rural-to-urban migration where people migrate to larger cities for work. When they move out of their provinces, Java as the most developed region is still the main destination (30.5 percent).[27]

Figure 3.2. Migration Destination from Sample Data: 2007-2008 (in percent)



Source: Own calculation based on IFLS 4 data. Migration is defined as individuals of nuclear-family.

Zelinsky (1971) presents a theoretical framework of 'migration transition' model that can be used to identify the temporal dimension of Indonesian migration pattern. Zelinksy's migration transition model classifies five different temporal stages (de Haas, 2010b).[28] Under this framework, Indonesian migration is more representative of an 'early transitional society' stage. At this stage,

[27] Indonesian Family Life Survey (IFLS), although representative of 80 percent of Indonesian population, lack coverage of districts and provinces in the eastern part of Indonesia. This further corroborates the plausibility of short-distance internal migration of rural-to-urban migration pattern.

[28] These stages are (i) pre-industrial traditional society, (ii) early transitional society, (iii) late transitional society, (iv) advanced society, and (v) super-advanced society (de Haas, 2010b).

there is an increase of all forms of mobility e.g. internal and international migration. This stage applies to the urbanising and developing countries which are in the process of becoming more industrialised.

The spatial dimension of Indonesian migration can be explained using the 'development tiers' model proposed by Skeldon (1997). This migration model is based on world systems theory of migration developed by Wallerstein (1974) and is used to analyse the spatial dimension of global migration (de Haas, 2010b).[29] Under this model, Indonesia is hence classified as a 'labour frontier' country in which the migration pattern is characterised by internal centralisation in the form of rural-to-urban migration and emigration to 'core countries' (developed economies).

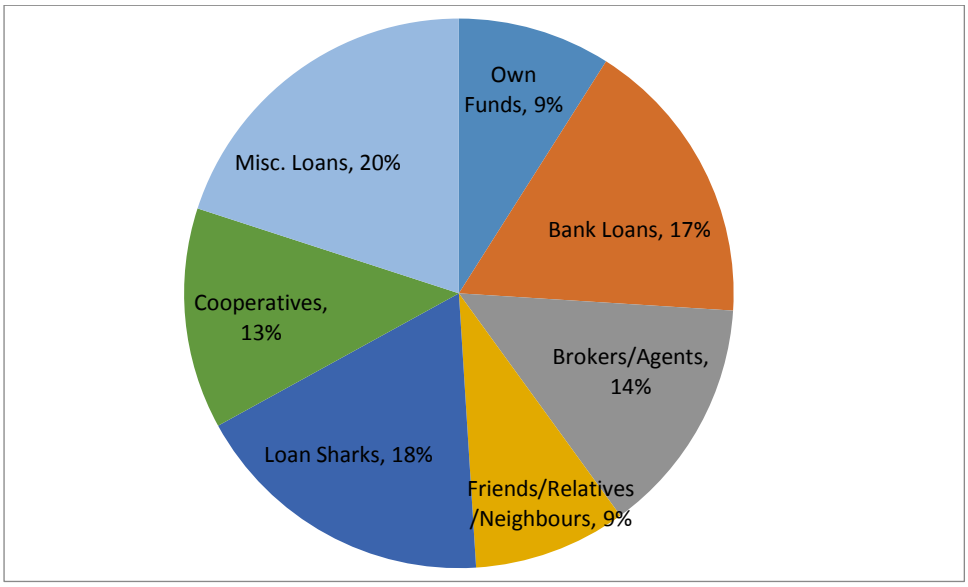
Many low-skilled Indonesian migrants are employed as maids or construction workers in Malaysia, Singapore, and the Middle East. These migrants are likely to come from the lower-end of the income distribution. Nonetheless, low-skilled migration is still relatively costly for typical poor Indonesian households. For instance, a news report indicated that the total costs of applying for a job as a housemaid in Singapore could reach more than 13 million rupiah.[30] This equates to approximately $1350 in 2012.

Some of the migrant agencies pass over the cost to the employers but some others charge the costs to the migrants through wage deductions.[31] Many Indonesian migrants have to provide up-front payments to finance their migration. According to Bank Indonesia (2010) around 58 percent of Indonesian migrants use their own source of funding to finance migration, and of this self-financing migrants, no more than one out of five migrants receive bank loans (figure 3.3.).[32] Given that these typical migrants are low-skilled and have low education level, it is likely that most of

[29] The spatial regionalisation of this model is classified as the following: (i) resource niches, (ii) labour frontier, (iii) expanding core, (iv) old and new core, and (v) declining core (de Haas, 2010b).
[30] http://finance.detik.com/read/2012/07/29/135526/1977637/4/biaya-calon-tki-yang-ingin-kerja-ke-singapura-rp-13-juta
[31] http://www.thejakartaglobe.com/news/singapore-agents-paying-extra-for-indonesian-maids/551659
[32] If migrants are unable to secure own-financing either through savings or borrowings, they can borrow from the Indonesian Migrant Workers Private Placement Company (PPTKIS).

them come from the poorer section of the population. Reportedly, around 40 percent of the Indonesian population is classified as poor or near-poor.[33] Thus, it could be the case that even if many of these individuals aspire to migrate, they may not be able to do so since they are credit-strapped and lack the financial resources needed to migrate.

Figure 3.3. Composition of Self-Financing Migration



Source: Bank Indonesia, 2008

Social Policy in Indonesia: The Rise of Social Protection Programs

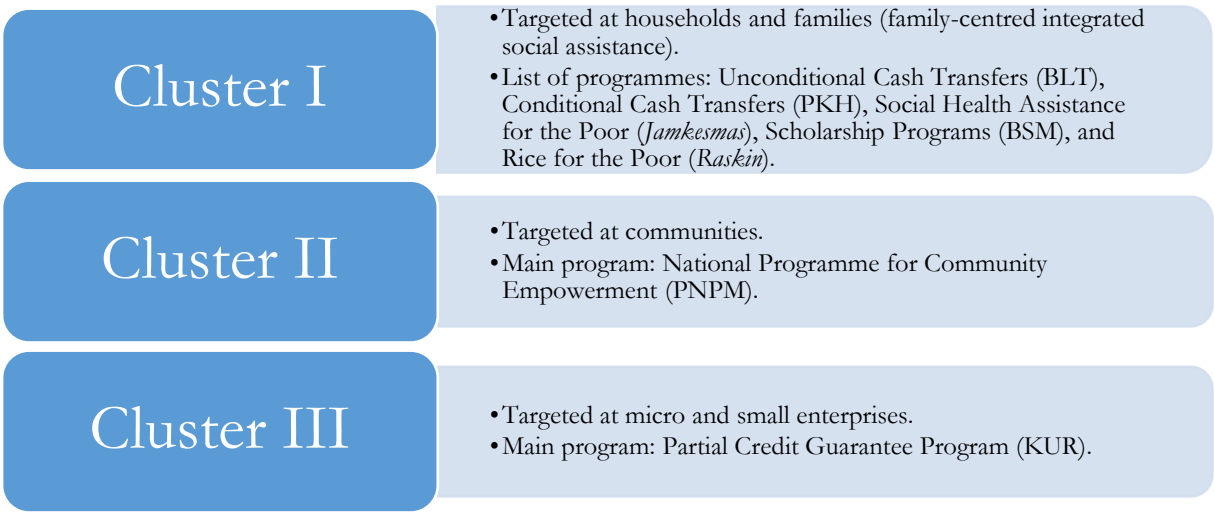
Indonesia is actually a late-comer in embracing social protection schemes as poverty alleviation strategy. In the New Order Regime (1966-1998), the economic development strategy of the administration focused on achieving high economic growth rates complemented with infrastructure development and explicit general price subsidies. Targeted social policy was close to absent, and public health and public education spending were more focused on building up infrastructure instead of targeting the 'people' directly with the goal of human development. Even so, the supply for the infrastructure of education and health facilities were geographically

[33] http://www.economist.com/blogs/banyan/2011/08/indonesias-poverty-line

unbalanced. Rural areas have had worse state of educational and health facilities. If welfare magnet applies, it is thus likely that people from less developed areas that are lacking in public infrastructure migrate to more developed areas such as major cities which offer better provision of education and health facilities.

The 1998 Asian Crisis came as a blessing in disguise for the initiation of social protection schemes in Indonesia. It established the foundation for a targeted social policy. Moreover, the change from autocracy to democracy following the political reform in 1998 has instantly increased openness in public discussion, including the elevated status of poverty as an issue not only discussed in academic sphere but also at the public (Widianto, 2013). These events paved the way for targeted social policy programs in Indonesia in the following years.

Figure 3.4.: Indonesia: Taxonomy of Social Protection Programs



Source: Widianto, 2013

As shown in figure 3.4., the Indonesian government classifies social protection program into three clusters (Widianto, 2013). The majority of the programs have generally received favourable political and public support with the exception of *Bantuan Langsung Tunai* (BLT), the unconditional cash transfers program. The program has triggered controversy since its inception because the opposition parties accused that such program was conducted by the administration only to win

back the support of the public following the social unrest after the revocation of fuel subsidy. Moreover, the chaotic distribution of the BLT has been the subject of harsh critics by the public and media alike. On the other hand, The Rice for the Poor (*Raskin*), which in practice is in-kind transfer, and Scholarship Program (BSM) have been the most popular in public and politics (Widianto, 2013).[34]

It was the year of 2005 that changed the stage of policymaking in poverty alleviation in Indonesia. As international oil prices rocketed sky high in the mid-2000s and the fact that Indonesia was a net oil importer, the government had to double its domestic oil subsidy.[35] Mounting fuel subsidies created uncertainty on the future of government budget sustainability. Moreover, studies have shown that fuel subsidies at large in Indonesia are mistargeted. The bulk of the subsidies (90 percent) are enjoyed mostly by the non-poor (Agustina et al., 2008). Consequently, the Government of Indonesia decided to rationalise the fuel subsidies, resulting in the revocation of substantial amount of fuel subsidies.

Although the move was successful in bringing the fuel subsidy down by 41 percent to Rp68.3 trillion (real term) in 2006, the nation had to swallow the bitter pill of a rapid surge in inflation due to fuel prices going up by 33 percent and 50 percent for gasoline and kerosene, respectively (Agustina et al., 2008; World Bank, 2012). As such, the secondary effects of general surge in prices of goods and services followed. Consequently, the Government of Indonesia enacted the first unconditional cash transfers (UCT) program to compensate the poor for the rise in fuel prices.[36]

In fact, the Indonesian government stated four reasons in the decision to gradually replace fuel subsidies with targeted social protection (Widianto, 2013). First is the presence of dynamic poverty

[34] World Bank (2012) presents comprehensive evaluation on the BLT program.
[35] Subsidies for domestic oil usage have been one of the central policy of 'generic price subsidies' development strategy inherited from the New Order Regime.
[36] 2005 UCT (*Bantuan Langsung Tunai*) was the first cash transfers scheme enacted by the Indonesian government. However, in-kind transfer was introduced earlier following the 1998 crisis. The program is called Rice for the Poor (*Raskin*). In contrast with BLT which is designed as temporary intervention, *Raskin* has been a permanent policy intervention since its inception (World Bank, 2012).

which means that many people are moving in- and out- of poverty. Social protection schemes will help to shield this vulnerable part of the population. Second is to use social protection scheme as a compensation for perverse economic adjustments due to policy shocks such as fuel subsidies rationalisation. Third is to use social protection scheme as protection for the poor against future economic shocks. Fourth reason is to have social protection scheme as a strategy to support better access to education, health, and jobs. The UCT is thus motivated especially by the first three motivations.

This paper focuses on the unconditional cash transfers called *Bantuan Langsung Tunai* (BLT). The objective of this UCT is simply to "supplement consumption for poor households facing unprecedented price increases" (World Bank, 2012). The program was designed to be one year-long starting in October 2005 (Agustina et al., 2008). There were 19.1 million beneficiaries (Widianto, 2013). The nominal amount of the UCT was approximately 15 percent of the 2005 expenditure poverty line (World Bank, 2012). Table 3.2. displays the program's main features.

Table 3.2. *Bantuan Langsung Tunai* (Unconditional Cash Transfer): Main Features

Official Name	**Bantuan Langsung Tunai (BLT)**
Program Type	Unconditional Cash Transfer (UCT), Temporary
Program Financing & Start/Usage Year	Tax-Financed, 2005-2006 & 2008-2009
Official Number of Beneficiaries (2005-2006)	19.1 Million Households
Official Value of Benefit (2005-2006)	Rp 100,000/month for 12 months (approx. $120/year)
Total Expenditure (2009 constant)	Rp 33,789 billion (approx. $3.38 billion)
Percent of Poor Household Covered (2005-2006)	50%

Source: World Bank, 2012; Widianto, 2013

4. Data and Method

I use the Indonesian Family Life Survey (IFLS) data for the empirical analysis. IFLS is a longitudinal survey initiated by RAND Corporation that covers general households, individuals as well as community level questionnaires. IFLS started in 1993/1994. The second wave (IFLS 2) was conducted in 1997 with IFLS 2+ following the Asian Financial Crisis in 1998. In 2000, the third wave (IFLS 3) was fielded and the most recent wave (IFLS 4) was conducted in 2007/2008.

IFLS covers 13 Indonesian provinces, thus it represents approximately 83 percent of the Indonesian total population. Although IFLS is not designed as migration survey, it is possible to derive migration indicators based on the set of questions asked in IFLS.[37]

Many micro-level empirical studies focus on individual decisions to migrate. In this paper, I focus instead on household level analysis. There are two reasons that motivate this decision. First, household-level analysis is more in-line with the NELM argument in which migration decision is more of a household decision.[38] Second, the use of household level data as unit of analysis means that I follow the empirical strategy of Stecklov et al. (2005) –hence, the results of the UCT effect on migration in this paper is quite comparable to Stecklov et al. (2005) who investigate the impact of CCT on migration decisions.

The fact that the UCT intervention happened in 2005-2006 makes IFLS 4, which was conducted between 2007 and 2008, an ideal wave to be utilised for the empirical analysis. The second UCT scheme, which was also related to a fuel price hike, started in the mid-2008. Meanwhile, the final interview round for IFLS 4 finished in April 2008. Thus, we can evaluate the effect of the 2005 UCT policy intervention on the migration decisions of households in 2007 and 2008 without worrying about the overlap with the second UCT program.

My dependent variable is binary and identifies whether a household has at least one nuclear family member who is a migrant. Households who already had nuclear family members as migrants before 2005 are dropped from our sample. Therefore, our sample is comprised of only households who had no nuclear family members as labour migrants in 2005. This ensures that the ensuing empirical

[37] In this paper, I use the household module to identify whether a household has a migrant family member. I only regard nuclear-family migration that consists of father, mother and children. This is more appropriate in the context of households' migration strategy formulation. For instance, it is less likely for in-laws or cousins to be sent out of the households to become migrants as part of the household's migration strategy because they have their own family whose preferences may not be the same with the interviewed household.

[38] Certainly, it is still possible to test NELM hypotheses using individual level analysis by incorporating household-level factors as level-two variables. Multilevel analysis is then used to correct the standard errors. However, this approach is not as direct a test for NELM as the household-level analysis.

analyses only capture the changes in nuclear family member composition following the UCT intervention i.e. whether these households in 2008 had nuclear family members who were labour migrants. Any potential changes of status in any households' children such as children who get married do not affect our sample and estimation as they will still be recorded as 'children' in our household sample, regardless of the change in their status from single to married. Indeed, their newly formed households are not included in our sample since they were not existed in 2005, and these children are still recorded as part of their original household sample as children.

I further differentiate between internal and international migration. Thus, technically I have two dependent variables: internal migration and international migration. There are two important features of the dependent variables. First, I focus only on the nuclear family (father, mother, and children). More distant family members such as in-laws or siblings of parents (uncles and aunts) are excluded from the analysis. The reason behind this decision is that nuclear family members are more relevant under the assumption of 'migration as part of household strategy' that we base this paper on. Second, to correct for migration history and network, as explained before, the sample is restricted only to households that have no migration history before 2005. Basically, I drop households who have family members that had migrated prior to 2005. Thus, all households in my sample have the same characteristic of having no labour migrant in the nuclear family before 2005. This leaves us with the total observation of 6282 households in the sample.

There are three main household-level explanatory variables. First is a measure of access to finance. I apply the decision tree mechanism depicted in figure 3.1 to construct an ordinal index of access to finance. The main emphasis of the index is to proxy the inability of households to secure external financing from financial institutions. This variable is introduced to test the impact of access to finance, or lack thereof, on migration. If households do not apply for loans, it means they do not face financial constraints, and I code it as 0. If households apply for loans and are successful in their applications, it means they have access to finance which relaxes their financial

constraints, and I code it as 1. Finally, if households apply for loans and get rejected, it means that they lack access to finance and may result in severe financial constraints, and I code it as 2. The drawback of this approach is that it is not possible to identify discouraged households. In other words, it is plausible that a household actually faces a financial constraint and needs external financing. Yet this household does not even file a loan application (discouraged lenders) that are likely to be caused by the lack of collateral, the lack of access to financial institutions, financial illiteracy, or other factors. To partially remedy for this drawback of not capturing discouraged lenders, I control for poverty variables using the multidimensional poverty index as discouraged lenders are more likely to come from poor households that do not possess sufficient collateral to obtain loans.

The second main explanatory variable is a binary variable that codes whether households received UCT in 2005-2006. This variable and its derivation will be used to assess the impact of unconditional cash transfers on migration. IFLS 4 actually also have records on households who receive CCT scheme such as *Program Keluarga Harapan*. However, the incidence of households receiving the CCT that also have migrant nuclear family member is too small.[39]

The third main explanatory variable is a measure of social policy at the district-level. By combining household-level and district-level data, I am able to introduce structural (contextual) determinants for the empirical analysis. I use school per km^2 and clinics per km^2 as proxies for the provision of quasi-public goods (public education and public health). This proxy is more relevant than per capita measures because less developed parts of Indonesia typically have larger area and are less densely populated.[40] Thus, using 'per area' measure also signals the ease of access to these

[39] Only 0.21 percent of our sample received CCT and have at least one nuclear family member as labour migrant in 2007-2008.

[40] Therefore, using per capita measures of health and education facilities result in larger values for rural areas because they have much less population. Indeed, most urban areas are in Java which has less space compared to most large non-Java islands. Hence, using per capita measures is actually counterintuitive.

facilities.[41] These variables are incorporated to assess the correlation between contextual social policy variables (universal social policy) and migration.

One central variable for the empirical analyses of this paper is the implementation of Amartya Sen's capability approach in the identification of poor households. Traditionally, poor households are identified using an income-based approach. Although IFLS surveys have questions on households' income, it may not fully capture the extent of households' deprivation levels. To circumvent this challenge, I employ Alkire-Foster dual cut-off approach to identify poor households (Alkire and Foster, 2011). Basically, the dual cut-off approach is counting the dimensions of poverty profile for each household in two steps of cut-off stages. The first cut-off is to determine households that are poor for each dimension. The second cut-off establishes the threshold for households to be considered as poor. This dual cut-off automatically incorporates the multidimensional aspects of deprivation in poverty identification.[42]

Table 3.3. Construction of Multidimensional Poverty Index

Dimension	Weight	Indicator	Weight
Education	1/3	Literacy: At least one adult member (15+) can't read and/or write	1/3
Health	1/3	Nutrition: At least one adult (15+) Body Mass Index (BMI) <18.5	1/3
Living Standard	1/3	Housing: At least 2 indicators are yes -> (i) House floor is from bamboo or dirt, (ii) House wall is from bamboo/woven/mat, (iii) House roof is palm leaves/grass/foliage/bamboo	1/15
		Electricity: No access to electricity	1/15
		Drinking Water: No access to safe drinking water or access >30 minutes' walk (>2.5km)	1/15
		Sanitation: Do not use own/shared toilet	1/15
		Cooking: Use firewood or charcoal	1/15

[41] I do not use government spending on education and health as proxy for universal social policy since the allocation of this sectoral budget may mostly go to the regular spending e.g. salaries to staff at ministries of health and education which may not deliver the goods and services directly to the community. Moreover, nominal government spending may not reflect the actual provision of goods and services due to corruption.

[42] Traditional poverty counting measure is usually unidimensional e.g. the income-based approach. Other approaches are union approach and intersection approach. The former identifies a household as poor if it falls below cutoff point in a single dimension, resulting in the exaggeration of poverty headcounts. Conversely, the later requires a household to be deprived in all dimensions to be considered as poor, leading to the understatement of poverty headcounts.

As such, I construct a multidimensional poverty index for each household. If a household is deprived in more than one-third of the dimensions of the poverty index, I identify it as a multidimensional poor household, and code it as 1. Table 3.3. presents the list of dimensions I use to construct the multidimensional poverty index.

I employ the standard three dimensions of human development to construct the multidimensional poverty index for each household: education, health, and living standard. For education and health, I use the literacy and nutrition indicators, akin to the usual practice in the computation of human development index. I focus on the adult-level indicators (>15+ years of age) for education and health dimensions because it gives more relevance to this paper's focus on labour migration. For the living standard dimension, I shy away from income-centric approach. Instead, I use five different indicators which are the critical aspects in the determination of well-being and quality of life: housing, electricity, drinking water, sanitation, and cooking. These indicators are also regularly used in the calculation of multidimensional poverty index.

For the first empirical analysis, this paper investigates the impact of the UCT policy intervention in 2005 on households' migration decisions in 2007 and 2008. The gold standard for policy impact evaluation and to establish causal argument is randomised evaluation. However, in the presence of non-experimental data such as IFLS, the appropriate approach is to mimic randomisation. In this paper, I employ a propensity score matching (PSM) strategy. I construct a statistical comparison group that is based on a model of the probability of participating in the treatment using observed characteristics. Then, I match the participants of treatment (UCT beneficiaries), on the basis of this propensity score, to the non-participants (UCT non-beneficiaries). PSM allows the use of single difference to estimate the average treatment effect of the policy intervention, defined as the mean difference in outcomes across the two groups. We are particularly interested in the average treatment effect of the treated (ATT). That is, the effect of policy intervention on

those who are the actual beneficiaries of the program. The cross-section estimator of PSM is specified as follows:

$$ATT_{PSM} = E_{P(X)|T=1}\langle E[Y^T|T=1, P(X)] - E[Y^C|T=0, P(X)]\rangle$$

where ATT_{PSM} is the average treatment effect of the treated (policy intervention impact), Y^T is the outcome for participants and Y^C is the outcome for matched non-participants.

To ensure the validity of PSM estimates, two conditions must be met. First, the assumption of conditional independence (unconfoundedness) must hold. This means that unobserved factors do not affect participation. Ergo, the uptake of the program should be based entirely on observed characteristics. Second, the assumption of overlap condition (common support) must hold. Basically, this condition stipulates that treatment observations have close comparison to the observations in the propensity score distribution.

To satisfy the first assumption, this paper benefits from the panel information structure of the IFLS. Recall that the multidimensional poverty index comprises seven indicators (table 3.3.). Since the targeting of the 2005 UCT is based on the poverty profile of households (income-based), the indicators used in the construction of our multidimensional poverty index could be argued as strongly correlated with income poverty. In other words, it is highly likely that in reality multidimensionally deprived households are also categorized as income poor. Therefore, it is appropriate to use the poverty profile of households to construct the propensity scores.[43] To further ensure that the conditional independence assumption is satisfied, I use the

[43] Rao and Ibanez (2005) use poverty scores to match treatment and non-treatment households in the study of the impact of Jamaica Social Investment Fund.

multidimensional poverty index indicators from IFLS 3 which was conducted in 2000.[44] Therefore, it is impossible for the UCT in 2005 to influence its conditional variables which were in 2000.[45] As for the overlap condition assumption, we look into this in the post-estimation.

The second empirical model is basically a cross-section analysis of the probability of a household to have a family member who is a migrant. I estimate a binary probit model of the IFLS 4 data at the household level. I incorporate the multidimensional poverty index dummy directly in the model. The regression specification is the following:

$$MIG_i = \beta + \beta_0 UCT_i + \beta_1 POOR\_MPI_i + \beta_2 UCT_i * POOR\_MPI_i + \beta_3 FIN\_ACC_i + \beta_4 EDU\_DIST_j + \beta_5 HEALTH\_DIST_j + \beta_n X_i + \varepsilon_{ij}$$

where MIG_i is the household migration decision both for internal and international migration. UCT_i is equal to 1 if the household received UCT in 2005-2006, $POOR\_MPI_i$ is equal to 1 if the household is identified as multidimensionally deprived, FIN_ACC_i is the access to finance index. Higher-level social policy variables are represented by EDU_DIST_j and $HEALTH\_DIST_j$ for access to education and health facilities, respectively.[46] X_i is a set of control variables at the household levels: household asset, household head's gender, household head's sex, household head's education, and location of households (urban vs rural; Java vs Non-Java). Since this second

[44] Hence, the multidimensional poverty indicators from IFLS 3 serve as our 'baseline' to construct the propensity score of receiving UCT in 2005 for each household.
[45] Certainly, between 2000 and 2005, there might be unobserved factors which took place, that might influence the propensity of households to be part of treatment (UCT 2005). However, given that IFLS 3 is the closest round to IFLS 4 (there was no IFLS 3+), and the fact that I use the standard indicators used in poverty identification to construct the propensity score, it is very likely that the conditional independence assumption holds.
[46] In practice, the inclusion of these two variables in the regressions are done separately. The pairwise correlation coefficient between these two variables is 0.89, signalling a high degree of multicollinearity.

exercise includes multilevel variables, the standard errors for all regressions are corrected for clustering at the district level.

5. Results

Propensity Score Matching: Impact of UCT

This section is dedicated to investigate the causal impact of the 2005 UCT on households' migration decisions. I employ three different matching methods: 1-to-1 matching, kernel matching, and radius matching. The use of the three different matching methods serve as a robustness check as each method has its own strength and weakness that results in the trade-off between bias and efficiency (Caliendo and Kopeinig, 2005). The nearest-neighbour 1-to-1 matching reduces bias but results in larger variance. On the other hand, the other two matching methods increase efficiency but at the expense of larger bias. Because of the contrasting trade-off of these matching methods, I report the results of the three matching approaches.[47]

Table 3.4 provides the results of the PSM exercise. To reduce the occurrence of bad matches, I put a threshold for the caliper.[48] In the matching process, I have to drop 'housing' variable because its inclusion results in bad matches and lower common support. Our sample has 1557 households who are the beneficiaries of UCT in 2005 (treated observations). As such, our data have large treated observations relative to the total sample.

As we can see from table 3.4., the effect of UCT is positive on migration decisions. However, it is only significant for internal migration. It is estimated that the average treatment effect on the treated (ATT) ranges between 2.1 and 2.6 percent for internal migration. Thus, I find that households who received the UCT in 2005/2006 have a 2.1-2.6 percent higher probability to send

[47] I do not conduct the nearest-neighbour matching with multiple neighbours because our treated sample size is pretty large relative to the untreated observations. In such condition, this method along with local linear matching often results in bad matches (Caliendo and Kopeinig, 2005).
[48] Caliper is the 'maximum permitted difference between matched subjects', and it is argued that tighter caliper leads to greatly reduced bias (Lunt, 2014).

a nuclear-family member as labour migrants in 2007/2008. On the other hand, I find no evidence of a significant impact of the UCT on international migration. In fact, the estimated insignificant effect is also small (0.3-0.6 percent). The results are robust to different matching methods.

Table 3.4. Average Treatment Effects on the Treated of UCT for Different Migration Types

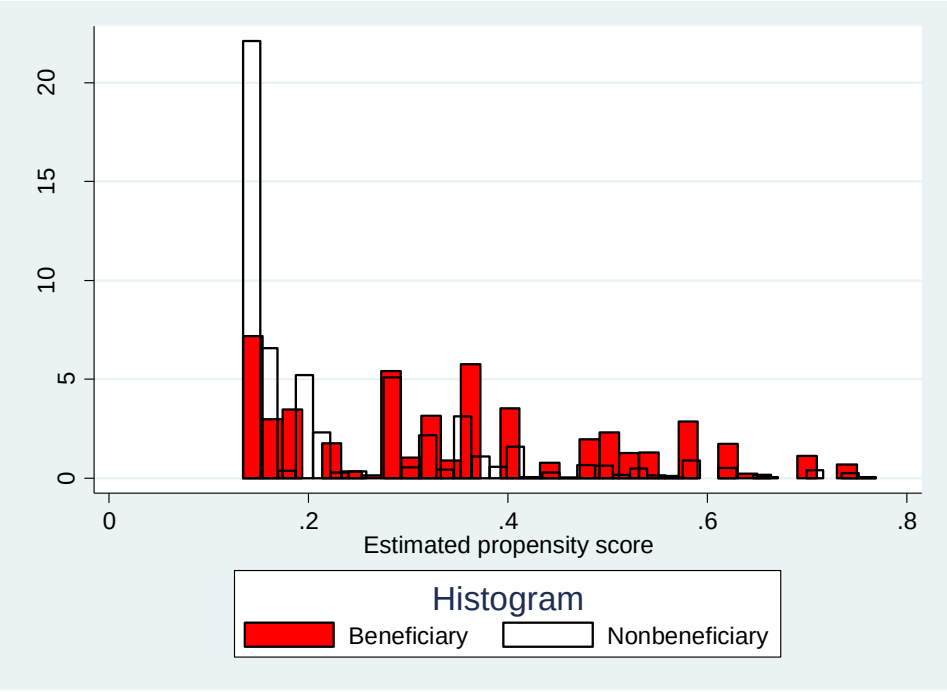
Migration Type	Internal Migration Coefficient	International Migration Coefficient
Matching Method:		
1-to-1 Matching (Caliper: 0.01)	0.021***	0.003
	(0.01)	(0.01)
Kernel Matching	0.026***	0.006
	(0.01)	(0.00)
Radius Matching (Caliper: 0.01)	0.026***	0.005
	(0.01)	(0.00)
Treated	1557	
N	6282	

Our results are the opposite of Stecklov et.al. (2005). They find that CCT reduces households' propensity in sending family members for international migration by 0.2 percent while no significant impact is found on internal migration. At first, this might sound surprising. However, recall that Stecklov et.al. (2005) analyse CCT while this paper looks into UCT. As we have discussed, in theory, conditionalities matter. Our results are more in-line with Angelucci (2004) who finds that households who receive an above average amount of CCT have around 0.4 percent larger propensity to migrate.

Angelucci (2004) demonstrates that once the negative effect of the conditionalities is isolated, the unconditional effect of cash transfers result in a higher migration propensity. Our results could be interpreted in such a way that UCT is more effective in providing financial constraint relaxation for internal migration. One plausible explanation is the nature of the costs of different migration types. Internal migration, for Indonesians, is in general viewed not as costly as international migration –both monetary and nonmonetary costs. The limited magnitude of financial relaxation from UCT is sufficient for internal migration but not for international migration.

Our results also confirm Angelucci (2014) who argues that cash transfers are viewed as positive income shocks that increase migration incentives. Furthermore, this also means that households incorporate the effect of UCT into their migration decisions. NELM predicts that if households perceive UCT as additional insurance against shocks, this will reduce migration incentives. At a glance, our results seem to contradict NELM although actually it is more in support of NELM. Once we take the capability approach on board, then households in principle still act as predicted by NELM. That is, if households find their financial constraints relaxed, they re-invest their positive income shock for future income stream through remittances from migrant family member (internal migration increased) but if the transfers do not affect financial constraints, households do not send family members for migration (international migration unaffected).

Figure 3.5. Common Support/Overlapping: Treatment and Control



To test the common support assumption, first I look into the distribution of the propensity scores of our treated and untreated observations (figure 3.5.). A simple inspection of the graph depicts that the matched samples overlap. This indicates that we have a good common support.

Second, I perform equality tests on unmatched and matched samples. The idea is that post-matching, the treated observations and their matches are not different. Table 3.5. shows that our PSM have quite excellent matches. In the unmatched sample, we see systematic differences between treated and control observations. However, after the matching procedure, the two groups are no longer statistically different. Moreover, the three matching methods are successful in maintaining the overall mean bias under 5 percent.

Table 3.5. Pre- and Post-Matching: Common Support Assumption Check[49]

Variable	Unmatched / Matched	Mean		% Bias	t-test	
		Treated	Control		t	p>|t|
electricity	U	0.175	0.066	33.8	13.14	0.000
	M	0.158	0.162	-1.2	-0.29	0.769
water	U	0.212	0.162	12.9	4.61	0.000
	M	0.191	0.208	-4.5	-1.21	0.226
sanitation	U	0.525	0.261	56.2	20.26	0.000
	M	0.511	0.498	2.6	0.68	0.496
cooking	U	0.527	0.323	42.1	14.93	0.000
	M	0.521	0.522	-0.1	-0.04	0.971
literacy	U	0.321	0.119	50.4	19.28	0.000
	M	0.281	0.289	-2.1	-0.52	0.606
nutrition	U	0.205	0.160	11.8	4.21	0.000
	M	0.208	0.197	2.8	0.76	0.449

Regression Results

In this section I analyse how UCT affects households' migration decisions with different poverty profiles. In addition, I also incorporate contextual variables i.e. education and health facilities in the regressions. Before discussing the regressions' results, I look into the distribution of UCT beneficiaries based on their multidimensional poverty index (MPI). As shown in figure 3.6., we

[49] The results in this table are based on a 1-to-1 nearest neighbour matching procedure without replacement method.

can see that non-MPI poor households are those who in general do not receive UCT. However, 13.51 percent of the sample is actually non-MPI poor households who receive UCT. This group is even larger than MPI-poor households who receive UCT (12.93 percent). There are also a considerable number of MPI-poor households who do not receive UCT (15.55 percent). This distributional pattern is not surprising since UCT in 2005 had issues with targeting (World Bank 2012; Sumarto et al., 2008). It also makes the analysis in this section by dividing the households into these four categories through interaction term more relevant.

Figure 3.6. MPI-Poor Households and UCT (percent of total observations)

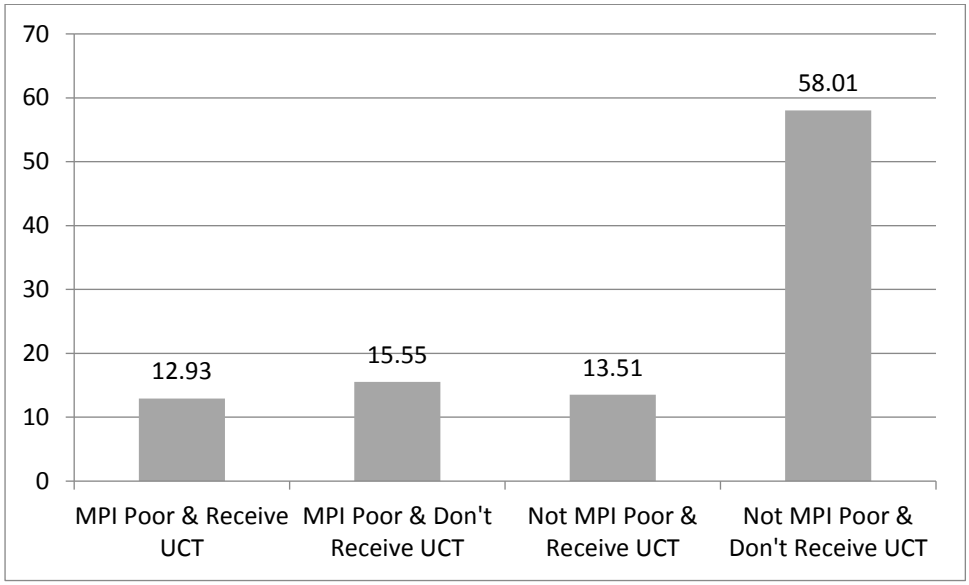


Table 3.6. and 3.7. report the baseline regressions results. Our baseline regressions use the UCT variable where households receiving UCT are coded as 1, and 0 if otherwise. Table 3.6. reports the baseline regression with the educational facilities variable whereas the baseline regression with health facilities variable is reported in table 3.7. Our main variable of interest is the interaction between the UCT binary variable and the MPI-poor households' status. The coefficient of this interaction term measures the impact of UCT for MPI-poor households. For all regressions I present the marginal effects next to the coefficients to ease interpretation. I find that MPI-poor households who receive UCT have 1.6-1.7 percent higher propensity to send family members for

internal migration. However, they are less likely to have at least a family member who is an international migrant (-1.0 percent lower propensity for international migration).

A plausible explanation for the greater migration-inducing effect of UCT on the poor is consistent with the finding in our PSM estimation. That is, the financial constraints relief provided by UCT is only sufficient to finance internal migration. Poor households who receive UCT perceive internal migration as a plausible further risk-diversification strategy. The inclusion of the interaction term in the internal migration regression results in a significant effect of the UCT variable. This means that the positive effect of UCT on internal migration's propensity is driven by the MPI-poor households who are the beneficiaries of UCT.

Meanwhile, UCT increases the incentive for international migration only for the non-deprived households as evidenced by 0.9-1.0 percent increase of international migration propensity (average effect). Plausibly, the non-deprived households restructure their risk-diversification strategy akin to the poor households who receive UCT that results in the higher propensity of internal migration. However, for the MPI-poor households who are the beneficiaries of UCT, the UCT effect is negative in which it lowers their propensity for international migration by 1 percent. Thus, for poor households, UCT is more seen as providing some extra insurance without inter-temporal dimension. For the poor households, the nominal amount of UCT is not sufficient to finance international migration nor can it be used as collateral for securing loans to finance international migration.

The contrasting results of UCT effects on internal and international migration can be explained by analysing the income vs substitution effects of UCT. As shown in table 3.6. and 3.7., in the case of internal migration, the income effect of UCT for poor households is superior to the substitution effect. As such, substantial income effect results in the greater capability for poor households to fulfil their functionings, which may include migration. Hence, UCT relaxes the financial constraints of poor households to embark on internal migration. If such households aspire to migrate, then it

may likely to happen. Thus, in this case the income effect dominates the substitution effect of UCT.

Conversely, in table 3.6. and 3.7., in the case of international migration, the substitution effect of UCT for poor households dominates the income effect. In other words, poor households who receive UCT view this extra income as substitute for international migration. The motivation behind this could be that poor households consider the nominal amount of UCT they receive is not sufficient to compensate the monetary and non-monetary costs of international migration. The plausibility of this explanation is enhanced by the marginal effect of MPI-Poor households (+0.6 percent albeit insignificant). This means that even though poor households are in general more likely to send family members abroad as migrant workers, but if they receive UCT, it reduces their propensity to migrate abroad. Simply put, in the case of international migration, the substitution effect dominates the income effect of UCT. If we relate our baseline results to the PSM results, it is easy to infer the cause for the insignificant impact of UCT on international migration in the earlier PSM estimation. As we can see in table 3.6. and 3.7., the average effect of UCT and the specific effect of UCT for MPI-poor households through the interaction term cancel out each other for international migration regression estimations. Meanwhile, the effect of UCT on internal migration for poor households is positive albeit understated.

Another interesting finding is the effect of access to finance. Table 3.6. and 3.7. show that the lack of access to finance variable only affects international migration. I find that households who face problems in securing external financing have 0.8 percent lower propensity to send family members abroad as labour migrants. This finding corroborates the descriptive evidence on the source of financing provided in figure 3.3 in which less than one-fifth of migrants who use self-financing secured their loans from banks. Indeed, around 48 percent of migrant workers are unable to pay for the migration costs with their own income and have to borrow from the recruitment agencies. This means a significant number of aspiring international migrants are likely to face lack of access

to finance, and hence are less likely to migrate internationally. However, lack of access to finance is not found to affect internal migration. The migration costs argument is appropriate to explain this finding. It is unlikely for households with lack of access to finance to be unable to send family members for internal migration because the monetary and non-monetary costs of internal migration are much lower.

I also find that rural households are more likely to have family members who are internal migrants. The marginal effect of rural households' variable is +1.6 percent. Interestingly, rural households' status does not make a difference for international migration. Moreover, the Java dummy variable is not significant for all regressions. These findings have three messages that correspond to the Zelinsky's model of migration transition as well as Skeldon's development tier model. First, international migration comes from both rural and urban households. Second, rural-to-urban migration dominates internal migration pattern. Third, all forms of mobility occur and not restricted in any specific region i.e. Java vs Non-Java. These three findings confirm our descriptive discussion that Indonesia is indeed categorised as an 'early transitional society' (Zelinsky, 1971) or as a 'labour frontier' (Skeldon, 1997).

Our baseline regressions also show that contextual variables are correlated with migration. In contrast with the UCT effect, the effects of universal social policy i.e. education and health facilities are consistent across different baseline regressions. Table 3.6. shows that better access to education facilities is associated with lower propensity to migrate by around 0.2-0.3 percent. Meanwhile, table 3.7. displays that better access to health facilities is negatively correlated to migration propensity. Two patterns emerge from our findings on these contextual variables. First, the negative impact of universal social policy is larger for internal migration compared to international migration. Second, the negative impact of universal social policy is smaller for health facilities as opposed to education facilities.

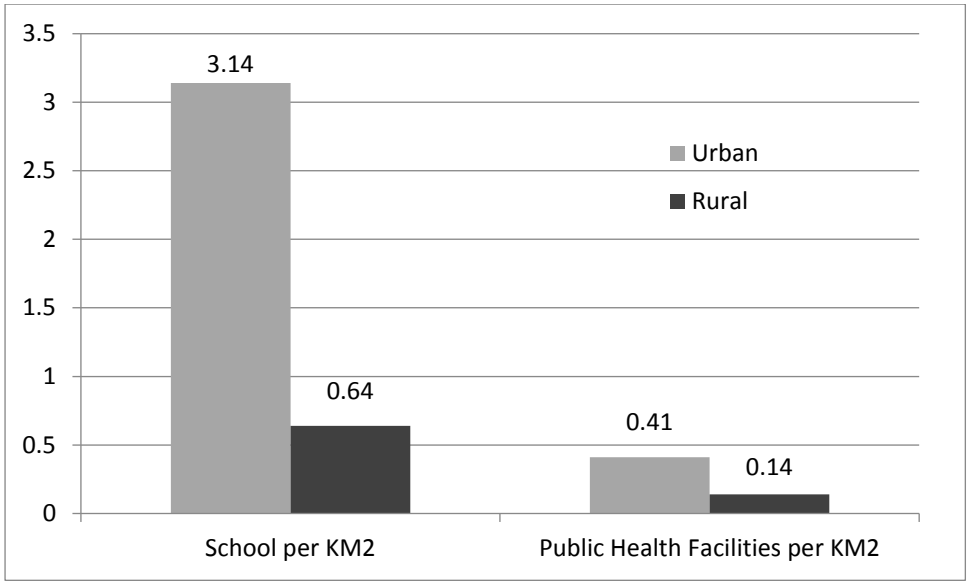
The negative effect of education and health facilities on migration propensity could be explained using the welfare magnet concept. In principle, I argue that the welfare magnet that attracts potential migrants to move to new destinations also applies at the home regions (reverse welfare magnet). Therefore, better welfare provision at home should reduce the aspiration of people to migrate, holding other things constant.

Public education and public health facilities mirror the development levels of the regions. As we can see in figure 3.7. and 3.8., urban districts have significantly better access to education and health facilities. Accordingly, the districts located in Java -which in general is more developed- also have easier access to education and health facilities. The districts that are lacking the access to quasi-public goods are also more likely to be economically more backward. This lack of local economic development is likely to contribute to the increasing aspiration to migrate. In fact, according to the capability approach of migration, if local development is lagging behind migration aspiration, it results in more migration (de Haas, 2010).

Regarding the larger effect of education facilities on migration as opposed to health facilities, I offer two explanations. First explanation is related to the opportunity costs of sending family members for migration in the presence of schools and other public education facilities. If appropriate school and public education facilities are present and accessible, households may decide to forego additional current income from sending their children to work, and instead choose to send their children to schools with the expectation of larger future income. The same effect is unlikely to apply for health facilities.

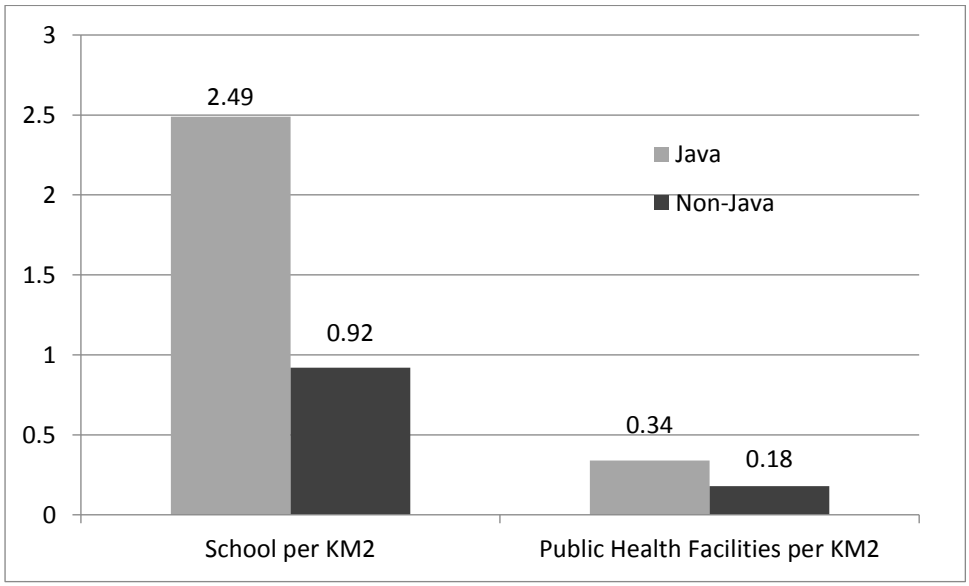
Second explanation is related to the demand for the local quasi-public goods. Using three Indonesian provinces in an experimental setting, Olken (2010) finds that through direct voting, people tend to view public education as the more important local public goods than public health. Hence, the provision of education facilities is likely to post greater effect than health facilities because people value them more.

Figure 3.7. School and Public Health Facilities Density: Urban vs Rural, 2005



Source: Own calculation based on World Bank database.

Figure 3.8. School and Public Health Facilities Density: Java vs Non-Java, 2005



Source: Own calculation based on World Bank database.

Finally, some household-level control variables also deliver interesting results. First, the logarithm of household asset variable is found to have a positive and significant impact on migration propensity. This indicates the importance of capability in migration decision. Households who have more assets are more likely to be more capable to send family members for migration if they aspire to. Unsurprisingly, the marginal effect of household asset is larger for internal migration

(+0.5 percent) than international migration (+0.2 percent). This corresponds to the less costly nature of internal migration as well as the path dependence of internal migration (*transmigrasi*) culture in Indonesia.

Second, households with low-educated heads have higher migration propensity. Basically, households with low-educated heads are more likely to be in the lower income distribution. Consequently, these households may choose to send family members to migrate as part of the strategies to maximise their income. This corresponds to the NELM theory. It also means that it is very likely that the majority of migration type in our sample is low-skilled migration.

In table 3.8. and 3.9., I modify the UCT variable. Instead of a binary variable of whether a household receives UCT, I instead use the logarithm of UCT. This modification of UCT variable serves two functions. First, it allows us to analyse the magnitude of UCT impact. Households who receive UCT could still be heterogeneous in terms of the nominal amount they receive. Some households may receive the cash more often than others, thus larger nominal amount, which may yield different impact on migration decision.

Second, it serves as a robustness check to see whether our results hold by changing the definition. In general, our results show no qualitative difference to the baseline regressions' results. However, for the internal migration results, the marginal impact of the logarithm of UCT (+0.1 percent) is lower than the binary UCT (1.6-1.7 percent). This means that the nominal value of UCT matters. Households who receive significantly larger amount of UCT have greater propensity to migrate internally. In order for a household to have a marginal impact of the logarithm of UCT at the similar value of the binary UCT, it needs approximately 16-17 percent increase of the nominal amount.

One critique that can be directed to this paper's empirical analysis is the assumption that the decision between migrating internally or internationally is conducted independently –which is an

implication of the binary probit model. In reality, households simultaneously decide on two decisions: (i) to send a family member for migration or stay at home, (ii) if they decide to send members as labour migrants, the next decision is whether to send this family member for internal migration or international migration. To incorporate this more realistic assumption, I re-estimate all regressions in table 6, 7, 8 and 9 now using bivariate probit. As we can see in table 10 and 11, our results are robust to this change in assumption.

6. Conclusions

This paper contributes significantly both to theory and empirics. The following are some notable contributions of this paper. First, I propose a hybrid concept of financial constraints which incorporate social policy and access to finance, and present how they affect migration decision using the framework of the new economics of labour migration and the capability approach. Second, I show that it is possible to combine internal and international migration in an integrated empirical analysis of migration determinants.

Third, I show that the effect of unconditional cash transfers (UCT) on migration decision depends on the income effect and substitution effect triggered. If income effect dominates, UCT is likely to result in increasing migration propensity. On the other hand, if substitution effect dominates, households may view UCT as substitutes for migration. These effects are also dependent on the types of migration. The income effect is likely to be greater for less costly migration i.e. internal migration while substitution effect is likely to be greater for international migration in which the UCT is often not sufficient to finance migration abroad.

Fourth, this paper finds that the poverty profile of households matter. Multidimensionally deprived households are more likely to view UCT as substitutes for international migration. Meanwhile, the non-poor households are more likely to use the additional income to finance

international migration. On the other hand, multidimensionally deprived households perceive UCT as positive income shocks that can be used to finance internal migration.

Fifth, I find that lack of access to finance reduces the propensity for international migration. However, access to finance does not influence internal migration. Also, better provision of quasi-public goods at the local level is found to be associated with less migration. In addition to mirroring the level of development, the negative impact of quasi-public goods provision at the local level on migration also indicates the presence of reverse welfare magnet.

To conclude, this paper contributes not only empirically to the literature but also theoretically. I take the challenge in integrating internal and international migration in a unified empirical analysis. Moreover, I also incorporate contextual variables in multilevel empirical setting. Finally, I establish the causality argument for unconditional cash transfers' impact on migration decision using counterfactuals. The effect of social policy on migration is not straightforward and it largely depends on the financial constraints of households.

Table 3.6. Determinants of Migration: Base Analysis I

Dependent Variable:	(1)		(2)	
	b/se	dY/dX	b/se	dY/dX
	0=No Migrant, 1=Internal Migrant		0=No Migrant, 1=International	
Household Level Variables:				
Received UCT	0.152	0.012	0.314***	0.009***
	(0.10)	(0.01)	(0.11)	(0.00)
MPI Poor Household	-0.078	-0.006	0.187	0.006
	(0.09)	(0.01)	(0.11)	(0.00)
Received UCT * MPI Poor Household	0.217*	0.016*	-0.345**	-0.010**
	(0.13)	(0.01)	(0.17)	(0.01)
Access to Finance Index	0.035	0.003	-0.265*	-0.008*
	(0.08)	(0.01)	(0.16)	(0.00)
Rural Household	0.212**	0.016***	-0.132	-0.004
	(0.08)	(0.01)	(0.12)	(0.00)
Household Located in Java	0.065	0.005	0.100	0.003
	(0.09)	(0.01)	(0.15)	(0.00)
Household Asset	0.063***	0.005***	0.061**	0.002**

	(0.02)	(0.00)	(0.03)	(0.00)
Sex of Household Head (HH)	-0.247***	-0.019***	0.017	0.000
	(0.07)	(0.01)	(0.12)	(0.00)
Age of Household Head (HH)	0.004**	0.000**	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
HH Education is Primary School or Lower	0.173**	0.013**	0.453***	0.013***
	(0.09)	(0.01)	(0.14)	(0.00)
District Level Variables:				
Education Facilities Per KM^2	-0.042***	-0.003***	-0.066**	-0.002**
	(0.01)	(0.00)	(0.03)	(0.00)
Constant	-3.082***		-3.467***	
	(0.32)		(0.51)	
Observations	6241		6241	
Districts	226		226	
Pseudo R2	0.05		0.06	
Log Likelihood	-1015.60		-471.19	

* p<0.10, ** p<0.05, *** p<0.01; Standard errors are clustered at district.

Table 3.7. Determinants of Migration: Base Analysis II

Dependent Variable:	(3)		(4)	
	b/se	dY/dX	b/se	dY/dX
	0=No Migrant, 1=Internal Migrant		0=No Migrant, 1=International	
Household Level Variables:				
Received UCT	0.156	0.012	0.313***	0.010***
	(0.10)	(0.01)	(0.11)	(0.00)
MPI Poor Household	-0.065	-0.005	0.191*	0.006*
	(0.09)	(0.01)	(0.11)	(0.00)
Received UCT * MPI Poor Household	0.214	0.017*	-0.342**	-0.010**
	(0.13)	(0.01)	(0.17)	(0.01)
Access to Finance Index	0.036	0.003	-0.259*	-0.008*
	(0.08)	(0.01)	(0.15)	(0.00)
Rural Household	0.275***	0.021***	-0.116	-0.004
	(0.08)	(0.01)	(0.11)	(0.00)
Household Located in Java	0.033	0.003	0.093	0.003
	(0.09)	(0.01)	(0.15)	(0.00)
Household Asset	0.063***	0.005***	0.062**	0.002**
	(0.02)	(0.00)	(0.03)	(0.00)
Sex of Household Head (HH)	-0.239***	-0.018***	0.020	0.001
	(0.07)	(0.01)	(0.12)	(0.00)
Age of Household Head (HH)	0.004**	0.000**	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)

HH Education is Primary School or Lower	0.183**	0.014**	0.452***	0.014***
	(0.09)	(0.01)	(0.14)	(0.00)
District Level Variables:				
Health Facilities Per KM²	-0.049	-0.004	-0.450*	-0.014*
	(0.14)	(0.01)	(0.24)	(0.01)
Constant	-3.170***		-3.500***	
	(0.31)		(0.50)	
Observations	6241	6241	6241	6241
Districts	226		226	
Pseudo R2	0.04		0.06	
Log Likelihood	-1018.75		-472.37	

* p<0.10, ** p<0.05, *** p<0.01; Standard errors are clustered at district.

Table 3.8. Determinants of Migration: Using Log of UCT Received I

Dependent Variable:	(5)		(6)	
	b/se	dY/dX	b/se	dY/dX
	0=No Migrant, 1=Internal Migrant		0=No Migrant, 1=International	
Household Level Variables:				
Log of Nominal UCT Received	0.010	0.001	0.023***	0.001***
	(0.01)	(0.00)	(0.01)	(0.00)
MPI Poor Household	-0.077	-0.006	0.187	0.006
	(0.09)	(0.01)	(0.11)	(0.00)
Log UCT * MPI Poor Household	0.016*	0.001*	-0.025**	-0.001**
	(0.01)	(0.00)	(0.01)	(0.00)
Access to Finance Index	0.034	0.003	-0.265*	-0.008*
	(0.08)	(0.01)	(0.16)	(0.00)
Rural Household	0.212**	0.016***	-0.132	-0.004
	(0.08)	(0.01)	(0.12)	(0.00)
Household Located in Java	0.066	0.005	0.101	0.003
	(0.09)	(0.01)	(0.15)	(0.00)
Household Asset	0.063***	0.005***	0.061**	0.002**
	(0.02)	(0.00)	(0.03)	(0.00)
Sex of Household Head (HH)	-0.248***	-0.019***	0.017	0.001
	(0.07)	(0.01)	(0.12)	(0.00)
Age of Household Head (HH)	0.004**	0.000**	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
HH Education is Primary School or Lower	0.174**	0.013**	0.454***	0.013***
	(0.09)	(0.01)	(0.14)	(0.00)
District Level Variables:				
Education Facilities Per KM²	-0.042***	-0.003***	-0.067**	-0.002**

	(0.01)	(0.00)	(0.03)	(0.00)
Constant	-3.072***		-3.464***	
	(0.32)		(0.51)	
Observations	6241		6241	
Districts	226		226	
Pseudo R2	0.05		0.06	
Log Likelihood	-1015.97		-471.25	

* p<0.10, ** p<0.05, *** p<0.01; Standard errors are clustered at district.

Table 3.9. Determinants of Migration: Using Log of UCT Received II

Dependent Variable:	(7)		(8)	
	b/se	dY/dX	b/se	dY/dX
	0=No Migrant, 1=Internal Migrant		0=No Migrant, 1=International	
Household Level Variables:				
Log of Nominal UCT Received	0.011	0.001	0.023***	0.001***
	(0.01)	(0.00)	(0.01)	(0.00)
MPI Poor Household	-0.064	-0.005	0.191*	0.006*
	(0.09)	(0.01)	(0.11)	(0.00)
Log UCT * MPI Poor Household	0.016	0.001*	-0.025**	-0.001**
	(0.01)	(0.00)	(0.01)	(0.00)
Access to Finance Index	0.036	0.003	-0.260*	-0.008*
	(0.08)	(0.01)	(0.15)	(0.00)
Rural Household	0.275***	0.021***	-0.117	-0.004
	(0.08)	(0.01)	(0.11)	(0.00)
Household Located in Java	0.033	0.003	0.094	0.003
	(0.09)	(0.01)	(0.15)	(0.00)
Household Asset	0.063***	0.005***	0.062**	0.002**
	(0.02)	(0.00)	(0.03)	(0.00)
Sex of Household Head (HH)	-0.240***	-0.019***	0.020	0.001
	(0.07)	(0.01)	(0.12)	(0.00)
Age of Household Head (HH)	0.004**	0.000**	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
HH Education is Primary School or Lower	0.184**	0.014**	0.453***	0.014***
	(0.09)	(0.01)	(0.14)	(0.00)
District Level Variables:				
Health Facilities Per KM^2	-0.050	-0.004	-0.451*	-0.014*
	(0.14)	(0.01)	(0.24)	(0.01)
Constant	-3.160***		-3.497***	

	(0.31)		(0.50)	
Observations	6241	6241	6241	6241
Districts	226		226	
Pseudo R2	0.04		0.06	
Log Likelihood	-1019.13		-472.44	

* p<0.10, ** p<0.05, *** p<0.01; Standard errors are clustered at district.

Table 3.10. Determinants of Migration: Bivariate Probit Estimates I

	(9)		(10)	
	b/se	b/se	b/se	b/se
Dependent Variable:	0=No Migrant, 1=Internal Migrant	0=No Migrant, 1=International	0=No Migrant, 1=Internal Migrant	0=No Migrant, 1=International
Household Level Variables:				
Received UCT	0.155	0.316***	0.159	0.314***
	(0.10)	(0.11)	(0.10)	(0.11)
MPI Poor Household	-0.078	0.187	-0.064	0.192*
	(0.09)	(0.11)	(0.09)	(0.11)
Received UCT * MPI Poor Household	0.216*	-0.345**	0.213	-0.342**
	(0.13)	(0.17)	(0.13)	(0.17)
Financial Constraint Index	0.033	-0.266*	0.034	-0.261*
	(0.08)	(0.16)	(0.08)	(0.15)
Rural Household	0.212**	-0.135	0.275***	-0.119
	(0.08)	(0.12)	(0.08)	(0.12)
Household Located in Java	0.064	0.099	0.032	0.092
	(0.09)	(0.15)	(0.09)	(0.15)
Household Asset	0.064***	0.061**	0.065***	0.063**
	(0.02)	(0.03)	(0.02)	(0.03)
Sex of Household Head (HH)	-0.247***	0.027	-0.239***	0.030
	(0.07)	(0.12)	(0.07)	(0.12)
Age of Household Head (HH)	0.004**	-0.000	0.004**	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
HH Education is Primary School or Lower	0.174**	0.456***	0.183**	0.455***
	(0.09)	(0.14)	(0.09)	(0.14)
District Level Variables:				
Education Facilities Per KM^2	-0.042***	-0.067**		
	(0.01)	(0.03)		
Health Facilities Per KM^2			-0.050	-0.448*
			(0.14)	(0.24)
Constant	-3.099***	-3.473***	-3.186***	-3.504***

	(0.32)	(0.51)	(0.31)	(0.50)
Observations		6241		6241
Districts		226		226
Log Likelihood		-1481.49		-1485.97

* p<0.10, ** p<0.05, *** p<0.01; Standard errors are clustered at district.

Table 3.11. Determinants of Migration: Bivariate Probit Estimates II

	(11)		(12)	
	b/se	b/se	b/se	b/se
Dependent Variable:	0=No Migrant, 1=Internal Migrant	0=No Migrant, 1=International	0=No Migrant, 1=Internal Migrant	0=No Migrant, 1=International
Household Level Variables:				
Log of Nominal UCT Received	0.011	0.023***	0.011	0.023***
	(0.01)	(0.01)	(0.01)	(0.01)
MPI Poor Household	-0.077	0.187	-0.063	0.191*
	(0.09)	(0.11)	(0.09)	(0.11)
Log UCT * MPI Poor Household	0.016*	-0.025**	0.016	-0.025**
	(0.01)	(0.01)	(0.01)	(0.01)
Access to Finance Index	0.032	-0.267*	0.034	-0.261*
	(0.08)	(0.16)	(0.08)	(0.16)
Rural Household	0.213**	-0.135	0.275***	-0.119
	(0.08)	(0.12)	(0.09)	(0.12)
Household Located in Java	0.064	0.100	0.032	0.093
	(0.09)	(0.15)	(0.09)	(0.15)
Household Asset	0.064***	0.061**	0.064***	0.062**
	(0.02)	(0.03)	(0.02)	(0.03)
Sex of Household Head (HH)	-0.248***	0.027	-0.240***	0.030
	(0.07)	(0.12)	(0.07)	(0.12)
Age of Household Head (HH)	0.004**	-0.000	0.004**	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
HH Education is Primary School or Lower	0.175**	0.457***	0.184**	0.455***
	(0.09)	(0.14)	(0.09)	(0.14)
District Level Variables:				
Education Facilities Per KM^2	-0.042***	-0.067**		
	(0.01)	(0.03)		
Health Facilities Per KM^2			-0.051	-0.449*
			(0.14)	(0.24)
Constant	-3.089***	-3.469***	-3.176***	-3.500***
	(0.32)	(0.51)	(0.32)	(0.51)
Observations		6241		6241

Districts	226	226
Log Likelihood	-1481.94	-1486.43

* p<0.10, ** p<0.05, *** p<0.01; Standard errors are clustered at district.

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Appendix

Descriptive Statistics

Variable	Definition	Obs	Mean	Std. Dev.	Min	Max
mig_dom	Internal Migration	6282	0.040592	0.197359	0	1
mig_int	International Migration	6282	0.015441	0.123308	0	1
uct	Receive UCT (Yes/No)	6282	0.264406	0.441052	0	1
log_uct	Log Nominal UCT	6282	3.624739	6.050457	0	16.30042
poor_mpi	1=Poor, 0=Not Poor	6282	0.284782	0.451346	0	1
fin_acc	Financial Constraint Index	6276	0.198693	0.417778	0	2
urbanrural	Urban=0, Rural=1	6282	0.497453	0.500033	0	1
java	Non-Java=0, Java=1	6282	0.622254	0.484862	0	1
hh_asset	Household asset (log)	6242	16.95454	1.65607	9.21034	21.89637
head_sex	0=female, 1=male	6282	0.822986	0.381711	0	1
head_age	age of HH head	6282	45.7071	14.44456	22	107
hh_edu	education level of HH head	6281	0.527941	0.499258	0	1
edu_dist	School area/km^2	6282	1.901452	2.757837	0	14.79327
health_dist	Clinic area/km^2	6282	0.278733	0.299044	0	1.579057
housing	MPI Housing	6282	0.06447	0.245608	0	1
electricity	MPI Electricity	6282	0.094715	0.292844	0	1
water	MPI Water	6282	0.175104	0.380086	0	1
sanitation	MPI Sanitation	6282	0.330627	0.470476	0	1
cooking	MPI Cooking	6282	0.377109	0.484701	0	1
literacy	MPI Literacy	6282	0.172079	0.377479	0	1
nutrition	MPI Nutrition	6282	0.17192	0.377341	0	1

Chapter 4

Capital Linkages and International Migration: A Fuzzy Set Analysis

1. Introduction

Within the migration and development literature, the interplay between factors of production and migration is usually approached from the lense of trade and migration nexus. Dating back to Stolper and Samuelson (1941) and Mundell (1957), the literature has mostly debated whether trade and migration are complements or substitutes. The literature has largely overlooked capital as one of the critical components of factors of production and its relation to international migration (Solimano and Watts, 2005). Classic economic models, such as the Stolper-Samuelson's factor price equalisation theorem, focus solely on labour as factor of production and how trade determines the mobility of labour. Meanwhile, capital, which is also a component of factors of production and its relation to the mobility of labours, has received less attention. For instance, the linkages between foreign direct investment (FDI), as a form of capital flow, and migration have been scarcely studied (Foad, 2012).

Traditional migration theories, more specifically macro-level theories i.e. neoclassical theory and world systems theory, provide several hypotheses on how capital can affect migration. Nevertheless, these two migration theories offer opposing predictions. On the one hand, neoclassical theory of migration, which provides an optimistic view in the role of development on migration, posits that capital movement would lead to less migration. As capital serves as the sources of investment for a country to grow, more penetration of capital shall lead to more development. Eventually, this process shall lead to lower migration due to narrower wage differentials. On the other hand, world systems theory argues for the opposite. That is, the

penetration of capital due to the expanding globalisation processes leads to more migration. World systems theory specifically argues that the global capitalist structure of the world economy results in transnational relocations of people due to the structural dislocations in the periphery countries created by the capital penetration from core countries.

Empirical studies that attempt to resolve such debate are scarce. Neoclassical theory literature has been more interested in empirically analysing the role of wage and income differentials as well as economic development as migration determinants. Meanwhile, world systems theory has not offered sufficient empirical approaches in the testing of their hypothesis. Previous empirical studies also present mixed evidence on whether capital and migration are substitutes or complements even though the neoclassical model of migration, also named as the standard trade theory in trade literature, clearly predicts substitution-relationship (Jayet and Marchal, 2016).

This paper argues that capital linkages are important determinants of international migration. In viewing capital linkages and their role as migration determinants, both FDI and trade are key components. One cannot say that FDI is a more important measure of capital linkages compared to trade. Trade also brings in capital flows to the equation through the imports of capital goods which are recorded in the current account. In turn, these imports of capital goods increase the capital stocks of a country in a similar way to FDI. Thus, to get a comprehensive picture of how capital linkages play the role as migration determinants, this paper simultaneously analyses both FDI and trade as measures of capital linkages.

The debate whether capital linkages and migration are substitutes or complements is rooted on conflicting predicted theoretical directions of the migration impact of capital inflows that comes through the FDI and trade channels. The neoclassical theory views these capital linkages as the engines for job creations which create the conditions for narrower wage differentials and lower migration. Conversely, world systems theory postulates that capital linkages shall result in the disruptions of the economic structure of the periphery countries. Such disruptions trigger changes

in the economy of the periphery countries which lead to an uprooted and mobile population that is fuelled by strong material and cultural links (Massey et al., 2008).

Another unsolved debate in the literature is how capital linkages affect migration selection. The literature on migration selection dates back to the Roy's model of self-selection (1951). The application of the Roy's model in migration research was popularised by Borjas (1987) who identifies the properties of self-selection in migration. Accordingly, the migration selection theory in the economic development literature is largely applied to the 'brain drain hypothesis' terminology which corresponds to the positive migration selection.

The general consensus is that brain drain has long been linked as detrimental to economic development (Docquier et al., 2007). However, the predicted impact of capital linkages on brain drain is mixed. Jayet and Marchal (2016) argue that under imperfect factor mobility, capital and unskilled labour flows are substitutes whereas capital and skilled labour flows are complements. Similarly, Ivlevs and De Melo (2010) suggest that in the presence of low-skilled intensive exports, capital flows and migration are complements. Meanwhile, Xu and Sylwester (2016) propose that the net effects of capital flows are theoretically indetermined, depending on the origin of the capital flows, and that education level does not matter, thus ameliorating the brain drain hypothesis. This indicates that capital linkages and migration selection conundrum still leaves a research void yet to be explored.

In terms of methodological approach, the current state of research in migration determinants, which also applies in the case of research concerning capital linkages and migration, signifies the dichotomy between quantitative and qualitative approaches with regards to empirical testing of migration theories. Economics-based migration theories are more reliant on statistical and quantitative approaches whereas non-economics-based migration theories rely on more qualitative or mixed methods in answering their research questions. Such methodological dualism is clearly displayed by the empirical studies that analyse these two competing theories: neoclassical theories

of migration (economics) and world systems theory (sociology), in which the former is characterised by more quantitative approach whereas the later is more resonant with qualitative method.

A consequence of such methodological dualism in the literature is the overabundance of the use of regression analysis in the empirical work on migration determinants. More specifically, regression-based analysis is heavily used for the empirical testing of neoclassical theory of migration. Although large-N regression-based studies provide us with measures of impact, they do not offer much in terms of scenarios and pathways. The inclusion of dummy variables only goes as far as checking whether groups of observations have additional impacts. Certainly, this does not mean that regression-based studies are less useful, but it largely serves the purpose of identifying average effects.

Meanwhile, for detailed case study, albeit offering rich narrative for a unit of analysis, it is lacking in the measurement department. The strength of case studies as a qualitative method is in providing us with detailed exposition but it generally lacks the predictive power. World systems theory has relied more on this qualitative approach. Empirical migration studies that employ regression analyses are largely in the field of economics whereas world systems theory is more at home in the theoretical sociology discourse. Consequently, this may explain why world systems theory has seen less theoretically-driven quantitative studies.

This paper offers a different perspective in its empirical approach. We are more interested in the 'causes-of-effects' approach which is well-served by the use of qualitative comparative analysis (QCA) methodology. This method aims to reveal the combinations of conditions in bringing about a particular outcome in specific cases. That said, QCA allows us to identify various pathways that lead to the same outcome such as the presence of high migration. In addition, the set-theoretic approach of QCA is able to identify the conditions that cause the negation of the outcome, for instance the absence of high migration. This is in contrast to regression-analysis which follows an

'effects-of-causes' approach in which the ultimate goal is to estimate the average effects of one or more variables in a population of cases.

The research questions of this paper are straightforward. First, this paper shall investigate how capital linkages relate to international migration. The key metrics for capital linkages are FDI and trade, which have rarely been simultaneously analysed as measures of capital linkages. Second, we are interested to identify and understand the different pathways that lead to migration. Thus, this paper is not interested in estimating the average effects of capital linkages on migration. By identifying various pathways that lead to migration, this paper is able to bridge the methodological dualism that has created the methodological divergence between neoclassical theory and world systems theory. Third, this paper asks how capital linkages relates to migration selection, more specifically the high-skilled migration, through different pathways.

Hence, this paper provides both theoretical and empirical contributions to the literature through the following contributions. First, this paper fills in the void in the literature by bridging two competing migration theories. Second, this paper provides an analytical and systematic, yet non-stochastic empirical approach that goes beyond merely measuring average effects.

This paper is structured as the following. In the next section, I discuss the theories and related literature on the capital linkages and migration nexus, including the brain drain. Then, I present the data and method applied in this paper, followed by discussion on the findings afterwards. The last section concludes.

2. Theory and Related Literature

To start this section, I shall discuss the relevance of trade in the discussion of capital linkages. Gage and Miroudot (2006) find a strong positive correlation ($R^2 = 0.83$) between FDI flows and trade. This finding is not surprising since increased trade intensity between countries can trigger attention to new resources and potential markets that highlight investment opportunities. Trade

policies could also be linked to capital flows policies. Countries that have more open trade policies with lower trade barriers are more likely to receive greater FDI. The case is stronger for least developed countries where trade openness is found to be an important driver for FDI (Brun and Gnangnon, 2017). In fact, even after controlling for other determinants of FDI, there is a strong empirical evidence that trade openness has the strongest correlation with FDI (Chakrabarti, 2001; Cantah et al., 2016).

The close link between FDI and trade as measures of capital linkages is also reflected in popular indices that measure openness. For instance, the Fraser's Institute "Economic Freedom of the World Index" consists of five measures of "Freedom to Trade Internationally" which lump together measures for trade and capital openness. Since trade impediments are consistently higher in developing countries as opposed to developed countries, good policies that facilitate trade is considered central to promote investment in developing countries (Gage and Miroudot, 2006).

The second discussion is to understand the nature and typology of FDI. Although FDI data are normally aggregated at the macro-level, FDI is inherently driven by micro decisions at the firm level. FDI is generally defined as private capital flows from parent firms (multinational enterprises) to an enterprise outside the parent firm's home country (Pajunen, 2008). FDI is classified into four types, depending on the firm's motivation:

1. Market-seeking
2. Resources-seeking
3. Efficiency-seeking
4. Strategic asset-seeking

Market-seeking FDI aims to get access to foreign markets, hence it cares more with on the market access for their products and services, whereas resources-seeking FDI has the objective to get access to resources not available at the home countries. Efficiency-seeking FDI looks for any cost-

differential advantages either to optimise economies of scale or rationalise production. Finally, strategic asset-seeking FDI is more interested in acquiring assets abroad, typically for competition motives.

As we now have cleared the relevance of both FDI and trade as key measures of capital linkages and why trade policy and trade openness matters for capital linkages, the next part shall discuss how neoclassical theory and world systems theory place these two key measures of capital linkages in relation to migration.

Neoclassical Theory of Migration: The Role of Trade and FDI

Despite the general acceptance that neoclassical theory of migration looks more into the role of wage and income differentials as the key migration driver, the theory itself has a long history with capital linkages as factors of production. The origin of the role of trade and FDI in migration can be traced back to the international trade literature. Stolper and Samuelson (1941) and Mundell (1957) propose that trade in goods and factors mobility are substitutes. Hence, a more relaxed trade policy by lowering the barrier to trade is predicted to reduce migration. Like wise, the theory also states that capital and labor flows must be substitutes. That is, assuming that technologies are identical across countries, those countries with capital abundance shall have outgoing capital flows to countries with higher returns to capital. In effect, countries that are labour abundant will have outgoing labour flows to countries that offer higher wages.

Interestingly, such clear theoretical prediction derived from the classical trade theory has failed to find unanimous empirical supports. In terms of trade and migration nexus, Markusen (1983) points out that in the presence of heterogenous technological level across countries, trade and migration could become complements. Schiff (1996) contends that due to the relaxation of financial constraints as a result of trade liberalisation, trade and migration can become complement as

people have more capability to migrate. Indeed, trade and migration could have a non-linear relationship called migration hump (Martin and Taylor, 1996).

Similar to trade, neoclassical theory of migration also offers unambiguous theoretical prediction of substitutes relationship on the interplay between capital flows, such as FDI, and migration. Hence, the neoclassical theory predicts that capital and labour move in opposite directions. The policy consequence is that by encouraging more FDI inflows into developing countries, it shall lead to less migration. Nonetheless, empirical studies that lend support to this notion have been largely underwhelming. In the empirics, the directional impact of FDI on migration has been dependent upon the skill content and level of migration (Jayet and Marchal, 2016).

A few number of studies such as Aroca and Maloney (2005) find that greater exposure to trade and FDI acts as migration deterrence. Job opportunities provided by FDI are also found to reduce migration incentives and that the general welfare increasing effect of FDI in the long run affects migration negatively (Sauvant et al., 1993). The complements relationship between FDI and migration have received a larger number of empirical evidence (Clemens and Williamson, 2000; Groznik, 2003; Javorcik et al., 2011). Furthermore, the human capital inducing impact of FDI inflows could lead to greater human capital accumulation. This process eventually results in higher wages which, as predicted by the neoclassical theory of migration, reduce migration (D'Agosto et al., 2013). Sanderson and Kentor (2009) find an evidence of a positive long-run relationship between FDI and migration. Using the migrant-receiving country perspectives, higher level of FDI is correlated with the greater presence of immigrant population (Buch et al., 2006; Foad, 2012).

Even within the neoclassical theory of migration, the channels in which FDI affects migration matter on the estimated impact of FDI on migration. If FDI results in greater job opportunities, it would reduce migration. Conversely, should FDI result in greater human capital accumulation amidst the presence higher welfare and wages, then it may lead to more migration. A possible explanation on why neoclassical theory of migration often finds mixed evidence in the empirics is

due to the nature of the assumptions in the economic model. The classical model that links capital and labour flows assume identical technologies across countries which in the real world simply does not exist. Likewise, the Stolper-Samuelson price equalisation theorem also assumes that the effect of capital flows on migration does not differentiate across different skill levels, which is also a simplified assumption. Certainly, the substitutability of capital and labour, hence FDI and migration, is likely to occur in the long-run as the dynamics of the economies of the countries move towards equilibrium.

However, the standard neoclassical theory of migration does not take into account the bumps and disruptions that occur during the process towards equilibrium that may explain the mixed empirical evidence. It may appear that neoclassical theory does not really apply in the real world. However, there is one consistent channel that ensures neoclassical theory to fit the empirics in accordance with the role of capital linkages in migration. That is, the channel through which capital linkages affect wage and income levels in developing countries. This in turn determines migration level. If the presence of capital linkages narrows wage differentials and increases income level, then it shall lead to more migration as evidenced in the majority of quantitative empirical studies.

World Systems Theory of Migration: The Role of Trade and FDI

World systems theory originated from sociology which is closely linked to the historical-structural school of thought. In its simplest definition, the historical-structural school of thought believes that due to the asymmetrical distribution of power across nations, the ever-expanding nature of globalisation and capitalism result in the perpetuation of inequalities and create the stratification of global economic order (Massey et al., 2008). This theory is inherently a critic to functionalist theories of social change that view development of nations as linear evolutionary changes through progressive stages of industrialisation and modernisation. The historical-structural approach then developed into the more widely known dependency theory which borrows many concepts from Marxist political economy literature (Massey et al., 2008; Castles et al., 2014).

In principle, world systems theory is not truly a migration theory[50]. Instead it is more of a grand theory that attempts to explain macrosocial processes of the global economy (Arango, 2000). To some extent, it is argued that world systems theory inherently looks at capitalism as a historical social system. Therefore, as a logical consequence of perpetuating capital accumulation, capitalist countries ought to search for new places to acquire resources, labours, and markets (Wallerstein, 1983; Jennissen, 2007).

Wallerstein (1974) is regarded as putting the conceptual building blocks for world systems theory. He argues that the modern world system has its roots which dated back to the 16th century and is characterised by the European hegemony and colonisation. Accordingly, such colonisation established the material and cultural linkages that initiate the flows of people. In the modern era context, following the waves of decolonisation process, neo-colonial regimes, multinational corporations, and FDI are now seen as the medium of the linkages and the new causes of economic dependency (Arango, 2000; Jennissen, 2007).

At its heart, world systems theory argues that "the penetration of capitalist economic relations into non-capitalist or pre-capitalist societies creates a mobile population that is prone to migrate" (Massey et al., 2008). Thus, in explaining the initiation of migration, world systems theory does not strongly argue that migration initation is driven by the need to searching for foreign labours to satisfy the needs of the capitalist economies but more on the migration-initiating impact of disruptions and dislocations of the economic structure brought about by capitalist penetration (Arango, 2000).

Wallerstein (1974) presents the typology of world systems theory in which he classifies the world economy into four groups as the following:

[50] The same claim can be applied to the neoclassical theory of migration in accordance with the role of capital linkages which originated from the international trade literature. The original intention of the model was to theorise the mobility of factors of production.

1. Capitalist core nations
2. Semi-peripheral nations
3. Peripheral nations
4. External nations

The main consideration in the grouping of the nations into one of the four classifications is the degree of dependency (de Haas, 2010). Hence, the relation between core and peripheral nations is structural whereas semi-peripheral nations act as some sort of buffer zones. In world systems theory, capital linkages are categorised as a type of material links. Globalisation and the advancement of infrastructure, communication, and connectivity ease the movement of people. Hence, world systems theory argues that the international movement of labours goes hand in hand with capital flows albeit in the opposite direction (Massey et al., 2008).

World systems theory is often criticised due to its neglect of the 'agency' properties of humans in which individuals are regarded as passive (de Haas, 2010). World systems theory, in this matter, is on the opposite polar as opposed to functionalist theories such as neoclassical theory of migration. The passive nature assumption of individuals and the missing agency in world system theory limit its views on migration as purely driven by structural forces created by global capitalism. In fact, Papademetriou and Martin (1991) argue that world systems theory is only useful and applicable at the global level.

Portes and Walton (1981) and Sassen (1988) use the world systems theory to descriptively explain international migration. However, Arango (2000) contends that world systems theory is not fit to be tested empirically due to its *ex ante* nature. This notion might explain why empirical works on world systems theory of migration have largely been restricted to descriptive approach. Later on, however, Massey et al. (2008) show that world systems theory, as any other social theory, can be subject to empirical test. Unfortunately, there has been a dearth of empirical testing for world

systems theory. Such gap in the empirical literature is indeed surprising since the theoretical notion of world systems theory is quite straightforward.

Contemporary views on world systems theory of migration argues that the incorporation of periphery nations into global capitalism should not automatically lead to more migration. De Haas (2010) proposes that institutional structures, internal socio-political cohesion and economic strength of countries influence the eventual net effect of the incorporation of a country into global capitalism. In other words, global capitalism could bring about both positive and negative effects on different regions and groups of people, depending on those factors.

Regardless of the opposing predictions provided by neoclassical theory and world systems theory on the interplay between capital linkages and migration, these two competing theories actually share the same central root causes of migration, which is inequality. The difference is only that while neoclassical theory sees inequality as the driving force in reaching equilibrium, world systems theory views inequality as stemming from asymmetrical international order which fuels the perpetuation of migration (Arango, 2000).

Migration Selection and High-Skilled Migration: The Role of Trade and FDI

The migration selection literature dates back to Roy (1951) that outlines an intuitive explanation on a model of selection based on comparative advantage and its implication on earnings in different occupations (Dahl, 2002). Borjas (1987) formalises Roy's model and applies it to theorise the self-selection of migrants. The migration selection model developed by Borjas (1987) in general introduces two different selection types for migrants: positive and negative selections. Basically, the model says that if a source country has lower earning variance, then high-skilled workers of the source country would go to a host country that offers a higher premium for returns to skill so that it creates positively selected migration where migrants have higher than average skills of source country's population. Positive selection of migrants is often called as 'brain drain'. Conversely,

negatively selected migrants occur due to the high wage dispersion in the source country so that low-skilled workers of the source country would migrate to host countries that could 'subsidise' their low income through a narrower wage structure.

High-skilled migration has become a more prominent pattern in international migration. This phenomenon is even starker for South-North migration. Docquier and Rapoport (2012) show that high-skilled migration from developing to developed countries has risen very fast in which the number of high-skilled migrants living in OECD countries went up by 70 percent in the 1990s, in contrast to merely 30 percent for low-skilled migrants. Indeed, Grogger and Hanson (2011) find that international labour migration has been largely characterised by positive selection (migrants having higher than average skills) and positive sorting (high-skilled migrants moving to countries that offer higher returns to skill).

The skill level of migrants plays the key role in determining the complementarity or substitutability of capital linkages measure such as FDI and migration (Jayet and Marchal, 2016). Empirical studies so far generate the following pattern regarding the role of skill of migrants in the capital linkages and migration nexus:

- Substitution relationship between low-skilled migration and FDI (Kugler and Rapoport, 2007)
- Complementary relationship between high-skilled migration and FDI (Docquier and Lodigiani, 2010; Foad, 2012, Gheasi et al., 2013, Hoxhaj, et al. 2015, Ivlevs and De Melo, 2010)

The substitutability between low-skilled migration and FDI lends support to the prediction of the neoclassical theory of migration. In this case, it is likely that the channel on which FDI affects migration is through job creations. This intermediary effect of job creations reduces the incentives to migrate for low-skilled workers in the origin country. The increased welfare for low-skilled

workers due to better jobs means that wage inequality within the origin country shrinks, which results in fewer negative selection and sorting of migrants, thus in line with Borjas' self-selection model.

Meanwhile, the complementarity relationship indirectly supports the prediction of world systems theory of migration. In this scenario, the channel on which FDI affects migration is likely through the increased capability due to higher wages and human capital accumulation in the source country. The material and cultural linkages that are created through capital penetration promote high-skilled workers who possess greater capability to migrate to be able to do so. Hence, positive selection and sorting of migrants occur.

3. Data and Method

This paper tries to capture the key metrics for each migration theories to be analysed in the empirical analysis. In contrast with regression analysis, fuzzy set uses the term outcome and causal conditions which are roughly the equivalent of dependent and independent variables, respectively. Recall that by using fuzzy set, we are more concerned with the ordering of conceptual categories instead of statistical correlations.

Fuzzy Set as a Research Method

Ragin (1987) introduces qualitative comparative analysis (QCA) as a middle-range alternative between qualitative and quantitative approaches. QCA is based on set-theoretic relations and methods. Schneider and Wagemann (2012) explains the features of set-theoretic methods as the following:

1. Set-theoretic methods work with membership scores of cases in sets
2. Set-theoretic methods perceive relations between social phenomena as set relations
3. The set relations are then interepreted in terms of sufficiency and necessity

Set-theoretic method also allows for the existence of 'equifinality' which is a scenario in which alternative causal conditions can lead to the same outcome. QCA aims at a causal interpretation by utilising the so-called truth table to analyse the causal complexity and to make use the principles of logical minimisation. One important advantage of employing QCA is that one does not have to worry about the number of cases since QCA should be used for disentangling set relations. Therefore, QCA is well-suited not only to small-N but also mid- and large-N analysis without violating any of its assumptions (Schneider and Wagemann, 2012).

The two main variants of QCA are crisp-set QCA (csQCA) and fuzzy set QCA (fsQCA). The main difference between these two variants is in the type of sets on which they operate (Schneider and Wagemann, 2012). csQCA operates under binary set membership score, that is 0 (full non-membership) or 1 (full membership of a case in a set). On the other hand, fsQCA allows for continuous gradation of set membership, thus allowing for partial membership. fsQCA allows for degrees of membership, thus we can differentiate between different levels of belonging anchored by two extreme membership scores at 1 and 0. A membership score of 0.5 in fsQCA implies a point of indifference where a case could be considered either a member or non-member of the set, hence the partial membership (Ragin, 2000). Therefore, fsQCA is superior to csQCA due to its accommodation of partial membership which reduces the loss of information stemming from binary set membership. In this paper, I use fsQCA -henceforth, fuzzy set analysis as the chosen method.

Fuzzy set has several clear advantages as an alternative middle-range research method. First, fuzzy set is best-suited for the exploration of causal conditions, defined as 'situations in which variables have an impact only in combination with a high or low degree of one or more other factors' (Epstein et al., 2008). Regression analysis relies solely on interaction term to identify causal configurations. However, multiple interaction terms reduce degrees of freedom. In addition, interaction term that includes more than two variables is technically unworkable due to the

difficulty of interpretation. However, fuzzy set allows the treatment of case aspects that appear jointly, systematically, and interdependent (Epstein et al., 2008).

The second advantage of fuzzy set is that we can can identify multiple pathways to an outcome. In fact, the outcome to be investigated could be both the presence and absence of the outcome. For each outcome, we can identify multiple pathways and scenarios that provide clearer picture on the causal conditions of our research questions. Meanwhile, regression analysis does not allow for causal conditions that only appear in limited number of subsets. In regression analysis, it would lead to deflated coefficients and inflated variance -in other words, insignificant effect. Hence, fuzzy set allows researchers to identify more complex causal narratives that could be obscured in regression analysis.

The third advantage of fuzzy set is its focus on finding causal sufficiency instead of tendential relationship (Epstein et al., 2008). Hence, although fuzzy set is not useful if one is more interested in assessing the magnitude or impact of a variable, fuzzy set is useful to find causal conditions or configurations of causal conditions that always (or nearly always) produce a particular outcome.

Outcome

In fuzzy set, the first step is to decide the outcome[51]. Empirical studies which utilise regression analysis normally use logarithm of migration level as their dependent variable. In fuzzy set, one needs to decide whether to focus on the presence of outcome, that is full-membership (1) such as high migration level or the absence of outcome, that is non-membership (0) such as low migration level. Naturally, we are more interested to find the causal conditions that explain the presence of outcome i.e. high migration level as outcome.

[51] 'Outcome' in QCA is equivalent to the 'dependent variable' in regression analysis.

Unlike regressions, the causal conditions for high migration outcome and low migration outcome need not be the same. In fact, such asymmetrical causal configurations are to be expected, especially in explaining social sciences phenomenon -in which regression analysis is not able to provide. In this paper, we only look into the causal configurations that explain the presence of high migration level.

Second, we are also interested to look into the interplay between capital linkages and high-skilled migration level (brain drain). Hence, the second set of our outcome is high-skilled migration as a measure of brain drain. Similar to total migration, the most interesting question is to find the causal conditions for the presence of high-skilled migration as our outcome. Although it is possible to also look into the low high-skilled migration but theoretically and policy-wise, it is more relevant to just look into the causal configurations that cause high low-skilled migration. This selective approach I take is consistent with Epstein et al. (2008).

I use IAB Brain Drain database for this paper.[52] The raw IAB brain drain data is basically the total number of foreign-born individuals aged 25 years and older, living in each of the 20 considered OECD countries. Education levels are classified into low, medium, and high skilled. The data range is 1980-2010 with 5-year gap. Hence, we have seven data points for each receiving country. The data is also disaggregated by country of origin. Since the empirical testing of world systems theory only makes sense in the context of South-North migration, our observations are 72 developing countries as classified by World Bank. The number of countries are smaller than the actual number of countries categorised as developing economies since we aim to have only the countries that have complete data for every outcome and causal conditions at all data points.

IAB also provides emigration rates data which contains the proportion of migrants over the pre-migration population (defined as the sum of residents and migrants in each source country) which

[52] The IAB Brain Drain dataset can be obtained at www.iab.de.

are 25 years and older. Formally, this definition of emigration rate could be written following Docquier et al. (2007):

$$m_{i,t}^{h} \equiv \frac{M_{i,t}^{h}}{N_{i,t}^{h} + M_{i,t}^{h}}$$

where $m_{i,t}^{h}$ is the high-skilled emigration rate of country *i*, of skill *s* (with *s* = *h* for high-skilled workers). *N* and M are number of residents and migrants, respectively.

To be able to gauge the true impact of causal conditions on the migration outcomes, I use the compound annual growth rate (CAGR) of the total emigration rates and high-skilled emigration rates. By doing so, we are able to remedy the distortion due to the ceiling-effect for some countries that already had high migration rates in 1980. Moreover, since CAGR is technically the mean annual growth rate, it also addresses any potential fluctuation of migration rates which we do not observe due to the nature of the data in which the data are not available at annual interval. Finally, by utilising the growth rates of emigration rates as our outcome, we are able to capture the long-run dynamics of the migration data.

Causal Conditions

The hypothesized determinants of migration that this paper employs as causal conditions are pre-selected based on the widely accepted migration theories.[53] In addition to the two key measures of capital linkages (trade and FDI), I include three causal conditions that are normally included in the empirical analyses of migration determinants. As such, the three additional causal conditions also represent three different migration theories. To further ensure there is no issue of reverse causality, the starting data-points for causal conditions are lagged by 20 years. Hence, the data for outcome is 1980-2000 whereas for the data for causal conditions has the time range of 1960-2000. Similarly

[53] Causal conditions in QCA are akin to independent variables in regression analysis.

as the outcome, I take the averages within the time range. The data source for the causal conditions are obtained from World Development Indicators.

1. GDP Per Capita

This causal condition is a staple variable in any empirical analysis of migration determinants. It also captures the essence of the neoclassical theory of migration. Since neoclassical theory postulates that more development leads to less migration, our expectation is that the presence of higher level of GDP per capita contributes to lower total migration. As for how GDP per capita causes changes in high-skilled migration, should neoclassical theory find an empirical support, then I conjecture that 'low GDP per capita' should be part of the causal combinations for high brain drain.

2. Income Inequality

Income inequality is at the heart of contemporary major migration theories such as neoclassical, world systems theory, new economics of labour migration (NELM), and the capability theory. However, these theories do not see income inequality the same way. For this paper, I use the lense of NELM in defining income inequality by looking into the relative deprivation variable. Accordingly, income inequality as causal condition here refers to within-country income inequality instead of between-countries. Therefore, this causal condition represents NELM which is also a leading migration theory. Following NELM, I expect income inequality to be a causal factor for high total migration. Meanwhile, low income inequality should be a causal factor for the presence of high-skilled migration as argued by Borjas' migration selection theory. I use the widely used Gini coefficient as a measure of income inequality.

3. GDP Growth

Contemporary migration theory such as the capability theory of migration looks closer into the sending country determinant. Capability theory gives a greater role for sending country's migration determinants. To capture the essence of capability theory, in which people migrate because they have the capability to do so, we need a causal condition that captures the economic strength of sending countries. GDP growth is a good proxy for this purpose because higher GDP growth indicates stronger economy which improves the capability of people to migrate should they decide to.

4. Trade

Trade is the first key measure of capital linkages. Hence this causal condition is of particular interest of this paper. We measure trade as total exports and imports as percentage of GDP. Although trade as percentage of GDP does not directly measure the extent of trade policy restrictiveness of a country, it is well accepted that this measure is a good indicator of trade openness. Since, trade policy is highly correlated with trade openness, I argue that trade as percentage of GDP is a good measure for the purpose of this paper. Moreover, trade openness is technically the outcome of trade policy.

5. FDI

FDI is the second key measure of capital linkages. Similar to trade, FDI is also the central analysis of this paper. I measure FDI as the net inflows in percentage of GDP. This is the standard practice in empirical analyses of FDI. Hence, FDI here is a flow data. Since the data used for migration is annual growth rates (flow), the FDI data shares the same type (flow) to our outcome data.

One may point out the absence of aid as one of the causal conditions. There are two motivations regarding its exclusion. First, as this paper attempts to reconcile each contemporary migration

theories in the analysis of capital linkages and migration, I opt to pick only one causal condition that strongly represents a leading migration theory such as GDP per capita for neoclassical economy, income inequality for NELM, and GDP growth for capability theory. These contemporary migration theories do not give aid a central role. Second, As I aim to balance the comprehensiveness and compactness in the selection of causal conditions. I have five causal conditions which I deem to be a balanced number of causal conditions in which we can still obtain meaningful and complex multiple pathways/scenarios but still compact enough so that our results do not fall into over-complexity.

Calibration of the Fuzzy Set

The first step in conducting fuzzy set is to specifiy the relevant sets, both outcome and causal conditions. We have discussed that for the outcome we shall have two sets of outcomes to be analysed: (i) high total migration; (ii) high high-skilled migration. Also, we have presented 5 causal conditions in which two of them (trade and FDI) are the key causal conditions of interests as they are the key measures of capital linkages.

The second step is to fuzzify the data set. Fuzzy set basically works a pseudo-continuous scale on which cases are coded (Epstein et al., 2008). In order to do so, one needs to combine theoretical knowledge and raw data understanding to establish the anchors for each set. Schneider and Wagemann (2012) state that obvious facts, accepted social scientific knowledge, and the researchers' own data collection process have to inform the calibration process. The following is the chosen anchors for each set in this paper:

- Total and high-skilled migration: There is no theoretical basis regarding the threshold of high or low migration growth rates. Thus, I use the normal standardisation procedure of the following formula: (value -min(value))/(max(value) - min(value)). Then, I take the top and bottom deciles as the anchors to determine full and zero memberships, respectively.

Having checked the data, the mean and median values are very close which implies that the distribution of our data is normal. Hence, I use the mean as the anchor for partial membership.

- GDP per capita: Since our cases are all non-advanced economies, I resume the same standardisation and fuzzifying approach as the outcome since the distribution of the GDP per capita data is also normal.
- Income inequality: The nature of Gini coefficient makes statistical standardisation inappropriate. The literature on income inequality agrees that a Gini coefficient value of 50 is considered high, so I pick that value as the anchor for full membership of high income inequality. For the zero membership (low income inequality), since the lowest Gini coefficient value in our data is 25, I pick 30 as the anchor. Accordingly, Gini coefficient value of 40 is the anchor for partial membership. Hence for income inequality as causal condition, I use the accepted knowledge in economic inequality literature.
- GDP growth: Literature on economic growth shows that 2 percent GDP growth rates are the standard for good economic growth rates for advanced economies. Therefore, for developing countries, we can safely assume that 2 percent GDP growth is low, so I use that as the anchor for zero membership. Statistical summary shows that 6 percent represents the top decile of GDP growth rates in our data, hence I pick that as the anchor for full membership (high GDP growth). I pick 4 percent as the anchor for partial membership.
- FDI: Literature on FDI does not offer explicit thresholds in determining low vs high FDI. To be on the conservative side, I rely on statistical properties and use 3 percent of GDP as the anchor for partial membership.
- Trade: Literature on trade does not specifiy thresholds to categorise levels of trade. Since the statistical properties of the trade data are normal, I treat the standardisation and

fuzzifying of trade the same as our outcome, that is using statistical standardisation. I pick 70 percent of GDP as the anchor for partial membership.

Creating Truth Table

After we generate the fuzzy set scores, we move forward to produce the truth table solution which is basically 'a list of different combinations of causal factors that have met specified criteria of sufficiency for the outcome to occur' (Poveda and Martinez, 2013). In other words, the truth table is basically a simplified data map. The purpose of the truth table is to help researchers in determining and setting the appropriate standard for the consistency of the causal relationship.

Table 4.1. Summary Table: Fuzzy Set Scores

country	code	gdppc	gini	gdpgr	trade	fdi	tmr	hmr
Angola	AGO	0.13	0.96	0.94	0.99	0.95	0.41	0.54
Albania	ALB	0.34	0.07	0.18	0.25	0.74	0.97	0.99
Armenia	ARM	0.13	0.15	0.17	0.69	0.80	0.44	0.92
Azerbaijan	AZE	0.66	0.01	0.91	0.89	1.00	0.08	0.38
Bangladesh	BGD	0.03	0.06	0.45	0.03	0.02	0.65	0.58
Bulgaria	BGR	0.95	0.04	0.04	0.87	0.97	0.96	0.96
Bosnia and Herzegovina	BIH	0.49	0.09	1.00	0.95	0.76	0.21	0.59
Belarus	BLR	0.87	0.02	0.25	0.99	0.10	0.70	0.83
Belize	BLZ	0.57	0.99	0.91	0.99	0.76	0.23	0.27
Bolivia	BOL	0.18	0.99	0.16	0.19	0.39	0.83	0.66
Brazil	BRA	0.98	1.00	0.70	0.02	0.11	0.72	0.87
Bhutan	BTN	0.12	0.68	1.00	0.71	0.05	0.00	0.00
Botswana	BWA	0.95	1.00	1.00	0.94	0.55	0.38	0.75
China	CHN	0.17	0.36	1.00	0.03	0.49	0.56	0.25
Cote d'Ivoire	CIV	0.06	0.51	0.39	0.55	0.07	0.61	0.44
Cameroon	CMR	0.05	0.68	0.31	0.14	0.05	0.77	0.31
Congo, Rep.	COG	0.24	0.90	0.66	0.98	0.94	0.69	0.79
Colombia	COL	0.85	0.99	0.59	0.05	0.15	0.62	0.61
Cabo Verde	CPV	0.11	0.90	1.00	0.87	0.73	0.25	0.28
Costa Rica	CRI	0.92	0.90	0.77	0.57	0.48	0.24	0.23
Dominican Republic	DOM	0.74	0.95	0.89	0.31	0.28	0.51	0.49
Algeria	DZA	0.96	0.34	0.46	0.30	0.03	0.03	0.07
Ecuador	ECU	0.77	0.98	0.49	0.10	0.06	0.75	0.72
Egypt, Arab Rep.	EGY	0.69	0.07	0.84	0.19	0.37	0.14	0.15
Fiji	FJI	0.50	0.81	0.22	0.97	0.66	0.52	0.45
Georgia	GEO	0.15	0.52	0.04	0.75	0.98	1.00	0.97

Ghana	GHA	0.04	0.40	0.23	0.20	0.16	0.42	0.48
Guatemala	GTM	0.40	0.99	0.47	0.13	0.08	0.86	0.85
Honduras	HND	0.11	0.99	0.51	0.72	0.29	0.80	0.56
Indonesia	IDN	0.46	0.07	0.92	0.14	0.03	0.10	0.17
India	IND	0.05	0.10	0.85	0.02	0.03	0.37	0.46
Iran, Islamic Rep.	IRN	0.99	0.73	0.71	0.11	0.02	0.31	0.04
Jamaica	JAM	0.80	0.86	0.03	0.86	0.42	0.20	0.24
Jordan	JOR	0.81	0.25	0.96	0.99	0.61	0.07	0.11
Kazakhstan	KAZ	0.99	0.05	0.09	0.87	0.97	0.94	0.90
Kenya	KEN	0.04	0.93	0.72	0.31	0.03	0.17	0.34
Kyrgyz Republic	KGZ	0.04	0.18	0.02	0.93	0.67	0.55	0.82
Lao PDR	LAO	0.05	0.12	0.96	0.28	0.43	0.49	0.68
St. Lucia	LCA	0.91	0.68	0.63	1.00	1.00	0.82	0.70
Sri Lanka	LKA	0.25	0.25	0.75	0.41	0.04	0.73	0.08
Lesotho	LSO	0.03	0.99	0.81	1.00	0.96	0.66	0.10
Morocco	MAR	0.21	0.50	0.76	0.22	0.04	0.30	0.30
Moldova	MDA	0.08	0.18	0.00	0.99	0.76	0.85	0.94
Maldives	MDV	0.91	0.95	1.00	1.00	0.41	0.28	0.18
Mexico	MEX	1.00	0.95	0.56	0.06	0.12	0.48	0.51
Macedonia, FYR	MKD	0.87	0.36	0.01	0.82	0.66	0.13	0.35
Mongolia	MNG	0.29	0.12	0.44	0.97	0.87	0.99	1.00
Mauritius	MUS	0.97	0.21	0.70	0.99	0.06	0.18	0.41
Malaysia	MYS	1.00	0.86	0.98	1.00	0.64	0.27	0.03
Namibia	NAM	0.52	1.00	0.24	0.94	0.50	0.87	0.93
Nigeria	NGA	0.09	0.69	0.54	0.13	0.42	0.68	0.55
Nicaragua	NIC	0.09	0.87	0.10	0.35	0.23	0.59	0.65
Pakistan	PAK	0.10	0.07	0.87	0.06	0.03	0.32	0.39
Panama	PAN	0.95	0.99	0.81	1.00	0.67	0.11	0.13
Peru	PER	0.57	0.94	0.37	0.06	0.17	0.79	0.77
Philippines	PHL	0.17	0.74	0.52	0.34	0.05	0.35	0.42
Papua New Guinea	PNG	0.03	0.96	0.44	0.86	0.62	0.34	0.14
Paraguay	PRY	0.47	0.98	0.78	0.95	0.05	0.90	0.89
Romania	ROM	0.99	0.03	0.02	0.42	0.55	0.89	0.86
Sudan	SDN	0.04	0.20	0.55	0.04	0.10	0.93	0.76
Senegal	SEN	0.03	0.77	0.13	0.31	0.05	0.45	0.69
El Salvador	SLV	0.46	0.95	0.09	0.32	0.07	0.92	0.73
Sao Tome and Principe	STP	0.05	0.67	0.83	0.50	1.00	0.54	0.37
Suriname	SUR	0.97	0.98	0.02	0.91	0.00	0.15	0.52
Thailand	THA	0.91	0.71	0.97	0.54	0.21	0.58	0.32
Tajikistan	TJK	0.03	0.08	0.00	0.97	0.55	0.06	0.80
Tunisia	TUN	0.70	0.50	0.82	0.64	0.31	0.01	0.06
Turkey	TUR	0.99	0.54	0.68	0.04	0.03	0.04	0.21
Ukraine	UKR	0.55	0.03	0.00	0.87	0.45	0.46	0.63
Yemen, Rep.	YEM	0.12	0.17	0.77	0.41	0.10	0.76	0.01
South Africa	ZAF	0.95	1.00	0.25	0.20	0.03	0.39	0.20
Zambia	ZMB	0.04	0.97	0.21	0.63	0.55	0.63	0.62

Where:

gdppc: GDP per capita

gini: income inequality (Gini index)

gdpgr: GDP growth

tmr: total migration rate

hmr: high-skilled migration rate

4. Results

Following the generation of the fuzzified scores, we examine the truth table. It is an instrument that depicts all logically possible combinations of causal conditions and indicates the distribution of cases across the combinations (Epstein et al., 2008). Using the fsQCA program, since we have 5 causal conditions, the truth table will produce a 32-row table, representing all (25) logically possible combinations of the causal conditions. The analysis shall be done for each outcome.

There are two key components of fuzzy set that needs to be used as the guidance in conducting the analysis. First is the consistency score. It is basically 'a measure of the extent to which membership strength in the causal configuration is consistently equal to or less than the membership in the outcome' (Epstein et al., 2008; Poveda and Martinez, 2011). The formula for the consistency score can be written formally as the following:

$$Consistency\ (X_i \leq Y_i) = \sum [min(X_i, Y_i)] / \sum (X_i)$$

The scores for consistency range from 0 to 1, with 0 indicating no subset relationship whereas 1 denoting a perfect subset relationship. A high consistency score is critically important at any step

of fuzzy set. Schneider and Wagemann (2012) propose that the consistency value for sufficient conditions should ideally be higher than 0.75.

Second is coverage score. Coverage basically 'applies to the proportion of the sum of the membership scores in an outcome that a particular configuration explains' (Poveda and Martinez, 2011). Hence, a high coverage score indicates that the configuratons are in consistent with the outcome and that many cases with the configuration outcome present. This means we minimise trivial configurations i.e. high consistency but low coverage. The coverage score formula is expressed as the following:

$$Coverage\ (X_i \geq Y_i) = \sum [min(X_i, Y_i)] / \sum (Y_i)$$

There are two types of coverage score: raw coverage and unique coverage. The former measures the proportion that a configuration covers the outcome while the later one measures the proportion that uniquely covers the outcome. Unique coverage is more restrictive. Therefore, if one is interested mostly in how well the configuration covers the outcome, raw coverage is applicable. A robust result of fuzzy set requires well-balanced scores between consistency and coverage.

Total Migration: Results

We start the analysis by investigating the causal conditions that create high total migration. Table 4.2. presents the truth table.

Table 4.2. Truth Table: High Total Migration

gdppc	gini	gdpgr	trade	fdi	number	tmr	raw consist.
0	1	0	1	0	1	1	0.96
0	0	0	0	1	1	1	0.95
0	1	0	1	1	3	1	0.94
0	0	0	0	0	2	1	0.94

1	0	0	0	1	1	1	0.94
0	1	0	0	0	6	1	0.93
1	0	0	1	1	3	1	0.90
1	1	0	0	0	3	0	0.86
0	0	0	1	1	5	0	0.86
1	0	0	1	0	2	0	0.85
0	1	1	1	0	3	0	0.85
0	1	1	0	0	3	0	0.84
0	0	1	1	1	1	0	0.80
0	1	1	1	1	4	0	0.80
1	0	0	0	0	1	0	0.80
1	1	1	0	0	6	0	0.79
1	1	1	1	0	3	0	0.78
1	1	0	1	0	2	0	0.76
0	0	1	0	0	8	0	0.75
1	1	1	1	1	5	0	0.73
1	0	1	1	0	1	0	0.71
1	0	1	1	1	2	0	0.70
1	0	1	0	0	1	0	0.63

The cut-off point for consistency score is set at 0.89 and we have 7 cases where high total migration is present and their consistency scores are above 0.89. Notice that not all 32-rows are presented since configurations that do not lead to the presence of outcome (full membership of high total migration) are dropped.

Before moving to the heart of the analysis, it is advisable to first analyse the necessary conditions for the outcome.

Table 4.3. Analysis of Necessary Conditions: High Total Migration

	Consistency	Coverage
gdppc	0.51	0.55
gini	0.68	0.59
gdpgr	0.58	0.54
trade	0.64	0.58
fdi	0.54	0.69

Conditions can only be considered necessary if they hav really high consistency scores (Schneider and Wagemann, 2012). As we can see from Table 4.3., no causal condition reaches consistency beyond 0.90. This means that no single causal condition is a necessary condition that lead to the outcome (high total migration). This finding corroborates the rising views in migration theories that no migration theory can alone explain the initiation or perpetuation of migration. It is more plausible that global migration is driven by the combinations of varying causal conditions. Indeed, Massey et al. (2008) contend that each theory has its own space and place in explaining migration.

Finally, the analysis of sufficient conditions is conducted to identify the multiple configurations i.e. pathways that explain an outcome. We keep the consistency threshold at 0.89.[54]

Table 4.4. Analysis of Sufficient Conditions: High Total Migration

Configurations	raw coverage	unique coverage	consistency
~trade*~gdpgr*~gdppc	0.333	0.040	0.916
~gdpgr*gini*~gdppc	0.373	0.047	0.904
fdi*~gdpgr*gdppc	0.253	0.103	0.898
solution coverage	0.530		
solution consistency	0.879		

(*) PATHWAY I: Cases with greater than 0.5 membership in term (~trade*~gdpgr*~gdppc):

BOL (0.81,0.83)
GHA (0.77,0.42)
CMR (0.69,0.77)
SEN (0.69,0.45)
ALB (0.66,0.97)
NIC (0.65,0.59)
BGD (0.55,0.65),
SLV (0.54,0.92)
GTM (0.53,0.86)

(*) PATHWAY II: Cases with greater than 0.5 membership in term (~gdpgr*gini*~gdppc):
NIC (0.87,0.59)

[54] Following the technical convention in QCA literature, ~ means the absence of causal condition (the case of zero-membership). For instance, ~trade corresponds to the low trade and ~gdpgr means low GDP growth.

BOL (0.82,0.83)
ZMB (0.79,0.63)
SEN (0.77,0.45)
CMR (0.68,0.77)
PNG (0.56,0.34)
SLV (0.54,0.92)
GTM (0.53,0.86)
GEO (0.52,1)
CIV (0.51,0.61)
(*) PATHWAY III: Cases with greater than 0.5 membership in term (fdi*~gdpgr*gdppc):
BGR (0.95,0.96),
KAZ (0.91,0.94)
MKD (0.66,0.13)
ROM (0.55,0.89)

Table 4.4. shows three multiple pathways that lead to high migration. The multiple configurations as a whole has a good consistency score (0.879) and respectable coverage score (0.53). Each configuration also has high consistency scores. The first two configurations, indeed also have good coverage scores.[55] The first configuration basically displays that high total migration is caused by the combination of low trade, low GDP growth, and low GDP per capita. The second configuration shows that high total migration is driven by low GDP growth, high income inequality, and low GDP per capita. Finally, the third configuration states that high FDI, low GDP growth and high GDP per capita cause high total migration.

One notable finding is the most unique case of the third configuration (Pathway III of table 4.3.). I find that the third configuration is composed only of Central and Eastern Europe (CEE) countries. Pathway III is also the scenario in which the country cases do not overlap. It seems that the lack of domestic opportunity combined with the material linkages provided by the FDI rush following the shift from socialism to market economy that started in 1990s explain the high migration from CEE countries. Add to the condition that CEE countries are relatively more developed that the majority of developing countries, the story of the high migration from CEE

[55] Epstein et al. (2008) suggest the cut-off scores for consistency and coverage scores to be 0.85 and 0.30, respectively.

countries can basically be explained by a combination of capability theory and world systems theory.

Meanwhile, Pathway I and II, as depicted in table 4.3 share two conditional causes (low GDP per capita and low GDP growth). Both pathways lend support to neoclassical economy and capability theory. However, the Pathway II also provides evidence of NELM through relative deprivation. The support for neoclassical theory is even more apparent in Pathway I in which the lack of trade is part of the configuration that explains high total migration. It is important to note though that low GDP growth is present in all three configurations/pathways.

Going back to the significant overlap between Pathway I and II, especially the presence of low GDP per capita and low GDP growth in these configurations, it is plausible to conjecture that the combination of these two causal conditions may yield a rather strong necessary condition that causes high total migration. Hence, I analyse the necessary condition for the configuration of low GDP per capita and low GDP growth: [~gdppc + ~gdpgr]. The consistency and coverage scores for this configuration are 0.880 and 0.631, respectively. This finding is very intriguing because this configuration is a good candidate to offer a causal configuration that is necessary to explain high migration in general. Interestingly, this configuration signals that the neoclassical theory of migration actually finds empirical support in general.

In general, neoclassical theory of migration receives empirical support in explaining high total migration. However, world systems theory finds more support for CEE countries. This implies that in terms of policy, we may have been looking to the wrong direction. As evidenced by the presence of low GDP growth in all configurations as a causal condition, instead of debating whether migration policy is sufficient to deter migration, the answer might lie in the origin countries i.e. how to make the domestic economic prospects act as migration deterrence.

As for capital linkages, we can draw the conclusion that both trade and FDI matter for total migration albeit with a different story. FDI as capital linkages is not evident in general. Instead, the positive role of FDI in facilitating migration is only apparent in a group of CEE countries. As for trade, low trade openness is part of a configuration that causes high migration. Since its presence as a causal condition is joint with two other domestic causal conditions, it is very likely that should these countrie engage more in international trade, then they may benefit from the general welfare creation effect of trade since it will simultaneously boost their GDP growth and GDP per capita, in line with the neoclassical theory.

High-Skilled Migration: Results

Similar to our approach in the analysis for total migration, I start with the generation of the truth table. For the outcome, we are interested in understanding the multiple pathways that lead to more high-skilled migration. Hence, I set the outcome to high high-skilled migration.

Table 4.5. Truth Table: High High-Skilled Migration

gdppc	gini	gdpgr	trade	fdi	number	hmr	raw consist.
0	0	0	1	1	5	1	0.970549
0	0	0	0	1	1	1	0.948598
1	0	0	0	1	1	1	0.944162
1	0	0	1	1	3	1	0.928169
0	1	0	0	0	6	1	0.912229
0	1	0	1	0	1	1	0.911525
0	0	1	1	1	1	1	0.907235
0	0	0	0	0	2	0	0.898461
0	1	0	1	1	3	0	0.896644
1	0	0	1	0	2	0	0.887836
0	1	1	1	0	3	0	0.819747
0	1	1	0	0	3	0	0.819398
1	1	0	1	0	2	0	0.813517
1	1	0	0	0	3	0	0.809409
1	0	1	1	1	2	0	0.777027
1	0	0	0	0	1	0	0.757936
1	1	1	0	0	6	0	0.738477
0	1	1	1	1	4	0	0.721186

1	1	1	1	1	5	0	0.713621
1	0	1	1	0	1	0	0.706161
1	1	1	1	0	3	0	0.704225
0	0	1	0	0	8	0	0.653386
1	0	1	0	0	1	0	0.600682

As we see from Table 4.5., the truth table generates 7 rows with the outcome present and a total of 23 rows of the 32 possible. I keep the cut-off point at 0.89.

Table 4.6. Analysis of Necessary Conditions: High High-Skilled Migration

	Consistency	Coverage
gdppc	0.54	0.58
gini	0.64	0.56
gdpgr	0.55	0.51
trade	0.68	0.62
fdi	0.56	0.71

Similar to to the analysis of necessary conditions result for the high total migration outcome, Table 4.6. shows that none of the causal condition is able to explain the presence of high high-skilled migration alone as a necessary condition. This finding proves that even for high-skilled migration determinants, no single migration theory dominates or can explain the outcome.

Table 4.7. Analysis of Sufficient Conditions: High High-Skilled Migration

	raw coverage	unique coverage	consistency
fdi*~gdpgr*~gini	0.307	0.098	0.955
~fdi*~gdpgr*gini*~gdppc	0.312	0.219	0.890
fdi*trade*~gini*~gdppc	0.246	0.045	0.947
solution coverage	0.571		
solution consistency	0.912		

(i) PATHWAY IV: Cases with greater than 0.5 membership in term fdi*~gdpgr*~gini:
BGR (0.96,0.96)
KAZ (0.91,0.9)

ARM (0.8,0.92)
MDA (0.76,0.94),
ALB (0.74,0.99)
KGZ (0.67,0.82)
MKD (0.64,0.35),
MNG (0.56,1)
ROM (0.55,0.86)
TJK (0.55,0.8)

(ii) PATHWAY V: Cases with greater than 0.5 membership in term ~fdi*~gdpgr*gini*~gdppc:
NIC (0.77,0.65)
SEN (0.77,0.69)
CMR (0.68,0.31)
BOL (0.61,0.66),
SLV (0.54,0.73)
GTM (0.53,0.85)
CIV (0.51,0.44)

(iii) PATHWAY VI: Cases with greater than 0.5 membership in term fdi*trade*~gini*~gdppc:
MDA (0.76,0.94)
MNG (0.71,1)
ARM (0.69,0.92)
KGZ (0.67,0.82),
TJK (0.55,0.8)
BIH (0.51,0.59)

I shall start discussing the analysis of sufficiency by looking the consistency and coverage scores of the solution which are 0.912 and 0.571, respectively. The consistency score for the brain drain exercise is definitely better than the total migration's. The coverage score also adequately improves. In general, we can say that the configurations that we draw for this exercise are more robust compared to the one for total migration.

Looking into each configuration's consistency and coverage scores, we also find evidence that our configurations are robust as well at the more specific level. Similar to previous exercise, we generate three configurations/pathways of causal conditions combinations. The first configuration (Pathway IV) says that a combination of high FDI, low GDP growth, and low income inequality cause high brain drain. The second configuration (Pathway V) records that a combination of low FDI, low GDP growth, high income inequality, and low GDP per capita are the drivers of high brain drain. Finally, the third configuration (Pathway VI) shows that a combination of high brain drain is caused by high FDI, high trade, low income inequality, and low GDP per capita.

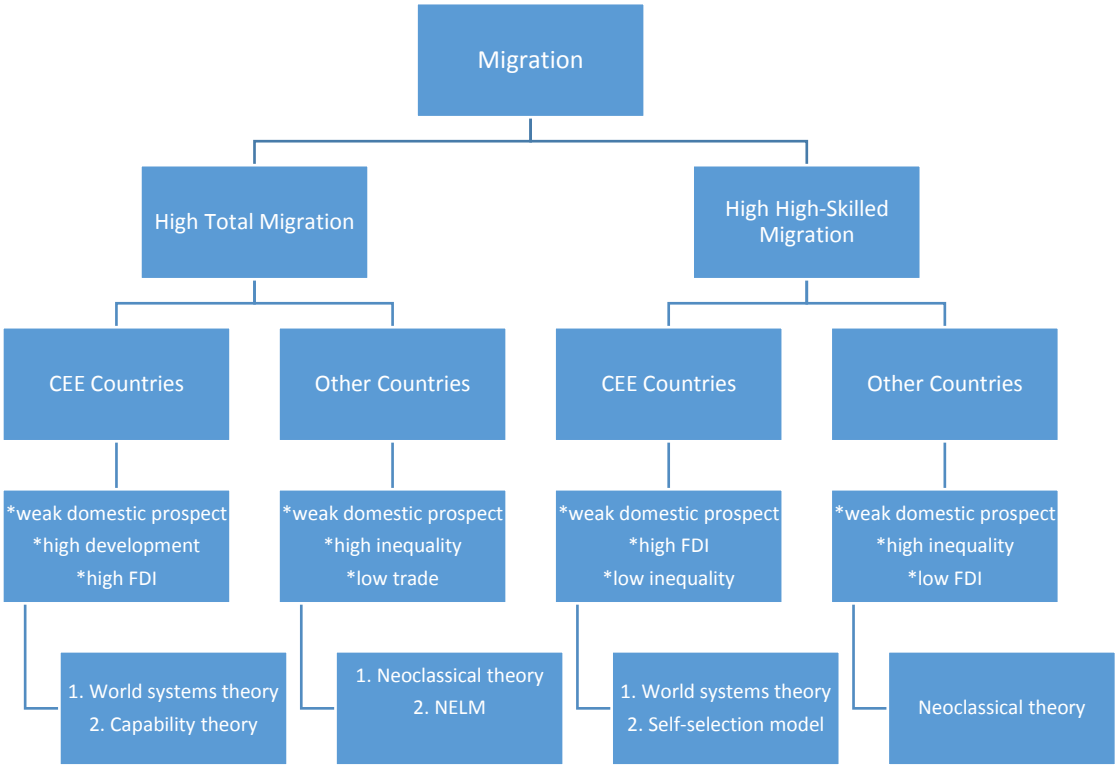
One surprising fact we find is the occurrence of CEE exceptionalism again in our analysis of causal conditions for high-skilled migration. However, in the case of high-skilled migration as outcome, it appears that now CEE countries have two multiple causal pathways that cause high level of high-skilled migration. Recall, however, that if we compare the case members of Pathway IV and VI, it is not hard to see that all country cases that are the members of the third configuration are also the members of the first configuration with the exception of Bosnia and Herzegovina. Therefore, we shall focus on Pathway IV. The presence of low GDP growth is unsurprising. Bleak domestic economy prospects give the ground for migration incentives, especially for those who are capable (high-skilled citizens). The low gini as a causal condition is also consistent with Borjas' model prediction in which high-skilled CEE workers move to countries that offer higher returns to skill and education. The presence of high FDI as a causal condition is consistent with our finding on the causes for total migration. This indicates that the migration from CEE countries are most likely dominated by high-skilled, hence an indication of brain drain (Ienciu and Ienciu, 2015). This evidence also supports the complementarity hypothesis of capital linkages and migration. Hence, for the CEE countries, the prediction of world systems theory is more appropriate.

Pathway V is comprised of non-CEE countries. Low GDP per capita and low GDP growth are present again in the configuration. The high income inequality condition may seem counterintuitive at first but this actually shows that the majority of those emigrating from these countries are in the upper level of the national income distribution. The low FDI causal condition complements the lack of domestic opportunities shown by low GDP growth and GDP per capita. So how capital linkages influence brain drain in Pathway V? Low FDI as a causal condition is a signal that the channel through which FDI affects migration is job creation as predicted by neoclassical theory of migration. Consequently, the flows of capital into the countries that are the members of Pathway V lead to reduced migration.

5. Conclusions

This paper investigates the multiple pathways that cause migration and brain drain. By utilising a fuzzy set approach, I am able to identify the configurations that explain the presence of high total migration rates and high-skilled migration. Some important findings of this paper are the following. First, this paper shows that no single migration theory has the explanatory power to serve as the necessary condition for migration. This approves Massey et al. (2008) conjecture that each migration theory has its place and space in each regional part ot the world. Second, there is evidence of CEE exceptionalism. The presence of pathways that are exclusively populated by CEE countries indicate that CEE countries' migration stories might be different. Third, I find that capital linkages matter for migration and brain drain. However, in relation to the previous point of CEE exceptionalism, the effect of trade and FDI on migration and brain drain is not singular. World systems theory applies for CEE case whereas neoclassical theory regarding capital linkages is more apparent for the rest of the world (figure 4.1.). Fourth, this paper finds broad evidence that for all multiple pathways identified, weak domestic economic prospects play role in the presence of high migration and brain drain. Thus, instead of making migration policies even more complex, policymakers may need to reflect and look inward, that the domestic and pull-factor due to robust domestic economy may be the way to forward to managing migration and brain drain.

Figure 4.1. Summary of Multiple Pathways and Related Migration Theories



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Chapter 5

Trade Liberalisation and Migration Hump: NAFTA as a Quasi-Natural Experiment

--"We want to export goods, not people"--
(Carlos Salinas de Gortari, President of Mexico 1988-1994)

1. Introduction

Theory on trade and migration dates back to Stolper and Samuelson (1941) and Mundell (1957) who propose that trade in goods and factors (labour) mobility are substitutes for each other. The model predicts that higher barriers to trade such as an import tariff will increase the price of scarce factors of production relative to the prices of other factors and goods. If migration is a response to international wage differential, trade protectionism shall trigger more migration as predicted in price-equalisation theorem. Consequently, lower barriers to trade such as through trade liberalisation policies, which promote international trade, shall reduce trade in factors of production i.e. labour, resulting in lower migration.

Trade and migration can also be complements. If we relax some assumptions, for instance if the country-pairs have different technologies or one country has the production with increasing returns to scale instead of constant retursn to scale and the presence of highly imperfect markets –in which these are the basis for trade instead of differences in factor endowments, then as shown by Markusen (1983) and Wong (1983), among others, the Stolper-Samuelson's factor price equalisation theorem that was introduced by Mundell (1957) no longer holds. In other words, wages between the countries will diverge, and thus trade and migration are complements. This

prediction is also stated in world systems theory of migration in which economic linkages created by the penetration of capitalism supports migration flows (Massey et.al., 1993).

Later theoretical models, on the other hand, contend that the interplay between trade and migration is ambiguous. These models usually classify the factor of production (labour) into two: skilled and unskilled. Panagariya (1992) contends that the ambiguity of trade-migration relationship is dependent on labour migrants' skill level in which skilled labours and trade are complements while unskilled labours and trade are subsititutes. Finally, Martin and Taylor (1996) propose that trade and migration are complements in the short-run but substitutes in the long-run, thus coining the term 'migration hump'. In this case, sluggish adjustment in the wake of trade reforms may initiate the hump (de Haas, 2010).

The lack of consensus in existing theoretical models indicates that the effect of NAFTA on Mexico-US migration is ambiguous a priori (Taylor et al., 2012). This gives the opportunity for empirical research that tries to test these opposing theoretical conjectures. The case of Mexico-U.S. bilateral migration and trade provides us with the environment for some type of 'natural experiment'. There are four reasons why NAFTA is well-suited for natural experiment for the analysis of trade liberalisation impact on migration. First, due to small membership of NAFTA, it is easier to isolate the migration between NAFTA's member countries as treated units. Second, although NAFTA entered into force in 1994, its phase-in stages last for fifteen years (Burfisher et al., 2001), which is a good case for long-term policy impact analysis. Third, because twenty years have passed since the establishment of NAFTA, such significant time period allows us to assess both short-term and long-term impact *ex-post*. Fourth, and perhaps most importantly, NAFTA is an excellent case to investigate the effect of free trade regime between countries with different level of economic development. This is conceptually important because in such condition, the assumptions of neoclassical theory are not likely to hold, making it possible to hypothesize that its predictions may not find empirical support.

This paper asks whether trade liberalisation leads to lower migration. This paper contributes to the literature by applying a systematic ex-post counter-factual analysis on the impact of trade liberalisation on migration flows based on counterfactual analysis at the macro-level. That said, Mexico-U.S. migration is an excellent example of 'natural experiment' with the NAFTA agreement. Moreover, it is well known that one of the rationale of NAFTA agreement is to reduce Mexico-US migration (Taylor, 1996). Thus, such policy goal is based on the premise that trade and migration are substitutes –in line with the traditional Heckscher-Ohlin-Samuelson model's prediction. By combining the longitudinal bilateral U.S. data on migration compiled by DEMIG-IMI and MOxLAD database on Latin American economies, I construct synthetic Mexico-U.S. bilateral migration flows and estimate the outcome of Mexico-U.S. migration such that if NAFTA had not been implemented.

In other words, this paper takes Mexico-U.S. as the 'treated unit' and other Latin America-US bilateral pairs as 'control units'. I use the potential control units of sixteen Latin American countries following the MOxLAD data availability. This counter-factual simulation approach i.e. synthetic control method allows us to directly and empirically test the effect of NAFTA (trade liberalisation policy) on Mexico-U.S. migration flow. This approach shares the same spirit with the common practice in micro-level policy impact evaluation (treatment vs control groups) while at the same time testing the competing theories about the interplay between trade and migration based on quantitative comparative case studies.

One challenge in evaluating NAFTA's impact on Mexico-US migration is the fact that the peso (tequila) crisis started in December 1994 which coincided with the year NAFTA entered into force. I take this into account in the analysis and show that the results still hold even after considering these dual events. However, it is evidently plausible that the tequila crisis prolonged the length and magnified the size of the migration hump.

Another challenge in evaluating Mexico-US migration is the burgeoning presence of irregular migration. Since official migration statistics do not record irregular migration, the real magnitude of Mexico-US migration is largely understated. There are several options in dealing with issue. First, by accounting for irregular migration and adding it to regular migration. The problem with this strategy is that the data quality on irregular migration statistics is unconvincing at best. Some studies have attempted to use apprehension, as a proxy for irregular migration. However, raw apprehension data is a seriously problematic indicator because it is basically 'a joint function of the number of migrants attempting unauthorized entry and the effort made to apprehend them' (Massey and Pren, 2012).

To remedy the lack of reliable migration data on total Mexico-US migration that also takes into account credible irregular migration numbers, I decide to exclude irregular migration estimates in the empirical analysis and focus on regular migration. The rationale is the following. Using regular migration statistics means that we will have comparable statistics over different migration corridors. Therefore, we have valid ground to construct our treatment and control units because they are statistically comparable. One may argue that regular migration statistics will largely understate the magnitude of unskilled migration. However, as explained by Ambrosini and Peri (2012), this is simply not the case as they find that highly educated Mexicans are significantly under-represented in Mexican migration. They further argue that family unification channel and migration network may explain this phenomenon. Since historically Mexican migrants have been largely composed by unskilled migrants, relatives in Mexico who are also relatively low-educated may join them via family unification channel. It is also possible that the impact of migration networks lowering migration costs mostly targets unskilled migrants.

Given these reasons, I contend that the use of regular migration flow statistics capture both skilled and unskilled migration without having to suffer from the risk of falling into 'estimates-within-estimates trap' if we also include proxies for irregular migration. I contend that this approach is a

safer option and reduces the risk of reaching erroneous conclusions due to severe inconsistency and measurement errors in the data.

I find that NAFTA triggers hump-shaped effect on Mexico-US migration. That is, in the short-run NAFTA resulted in more migration. Our estimate shows that the time-period of the migration hump for NAFTA is about fifteen years, surprisingly consistent with the migration hump hypothesis (Martin and Taylor, 1996; Martin, 2005). I find that that had NAFTA not been implemented, Mexico-US migration rate would have been in average 0.07 percentage point lower (measured as percentage of regular migration to Mexico population). Given the average value of Mexico-US migration rate over our sample period is only 0.08 percent, the policy impact of NAFTA on migration is thus considerably large. Incorporating dual events of tequila crisis does not change the results. Our pre-interventon estimates of synthetic Mexico is close to perfectly match the treated Mexico. In addition, our placebo estimates indicate that our synthetic control results are unlikely to be driven by chance.

I start this paper by first providing some background on the development of NAFTA. I then discuss the theoretical debates and empirical findings on the relationship between trade and migration. The data and method applied in this paper is then described, followed by a discussion on the findings afterwards. The final part concludes.

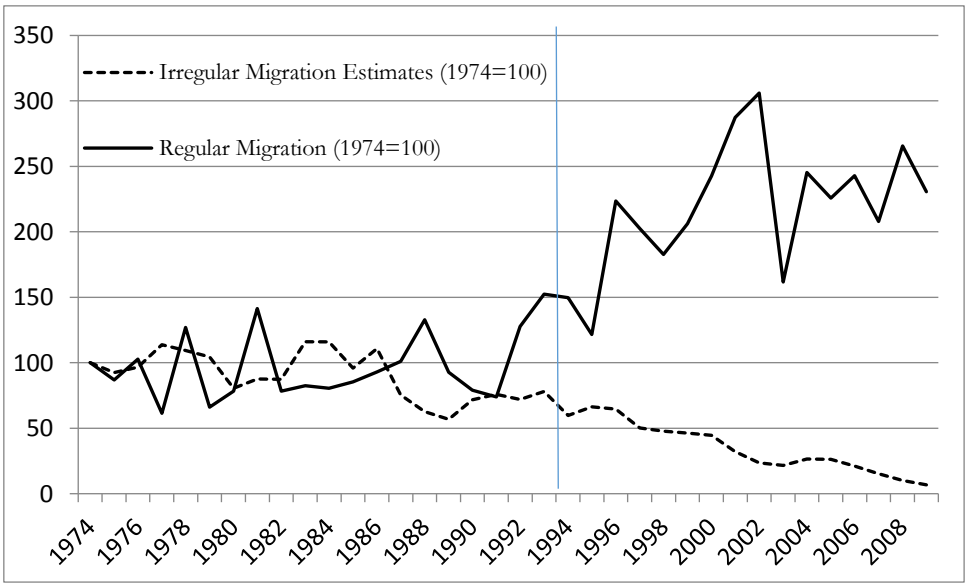
2. Background

The history of NAFTA for Mexico can be traced back to the failure of import substitutions industrialisation (ISI) implemented by the Mexican government in 1980s. This development strategy relies heavily on public spending. Partly due to the oil crisis of 1982, in order to support the ISI strategy Mexico had to rely on external debt (Galan and Oladipo, 2009). Unsurprisingly, Mexico immediately then fell into debt crisis. In response to the debt crisis, Mexico changed the direction of their economic policies in the following decade. In addition to curbing inflation,

Mexico implemented economic restructuring by privatising many state-owned enterprises, deregulating domestic market, and reducing barriers to foreign trade and investment (Kehoe, 1995). In 1986, Mexico gave its assent to the General Agreement on Tariffs and Trade (GATT). In 1994, Mexico's economic liberalisation episode culminated when NAFTA, the largest free trade bloc in the world, came into force.

Migration has never been an explicit agenda of NAFTA. Little attention was paid to the issue of labour mobility, quite in contrast to European Union which puts labour mobility as part of the agenda (Fernandez-Kelly and Massey, 2007). Interestingly, from the US perspectives, NAFTA was actually seen as *panacea* for chronic migration pressures from Mexico (Hufbauer and Schott, 2005). *Ex-ante* analysis based on neoclassical theory also supported this expectation. Unfortunately, this prediction turned out to be quite incorrect as migration kept on growing following NAFTA's inception (Hufbauer and Schott, 2005; Fernandez-Kelly and Massey, 2007; Martin, 2005; Zamora, 2009). The US reaction for the undeterred migration flow was to increase border controls which have been growing more repressive since 1986 (Fernandez-Kelly and Massey, 2007).

Figure 5.1. Growth of Mexico-US Migration Flows, 1974-2009



Source: DEMIG database, Massey and Pren (2012), Own calculation. Regular migration excludes IRCA naturalisation.

Has overall migration really increased since the introduction of NAFTA? Massey and Pren (2012) construct an indicator to proxy for irregular migration. They divide the apprehension number by the number of border patrol agents. Although this metrics is a really rough proxy for the real value of irregular migration, as they carefully state, it can be useful to analyse its trend and is conceptually better than mere raw apprehension statistics. In figure 5.1., I plot irregular and regular migration for 1974-2009. To get the true flow value of regular migrants for each year, the IRCA naturalisation numbers are excluded in regular migration statistics. I transform the absolute value into an index (1974=100) so that we can get clearer depiction on how Mexico-US immigration has evolved over time.

Figure 5.1. shows that following the start NAFTA in 1994, there has been a considerable surge in regular migration from Mexico to US. As explained previously, this surge is likely to be caused by increase in migration from a range of skill and education levels. On the other hand, the estimates of irregular migration shows steady decline. One may point out that Massey and Pren's (2012) estimates of irregular migration actually depict stricter border controls. Even if this is the case, the trend in irregular migration is stagnant at best. As a result, we see the widening gap between regular and irregular migration. This casual observation suggests that NAFTA is associated with more regular migration.

Several factors related to NAFTA could be attributed to the continuing rise of Mexico-US migration. First, NAFTA had a 15 year phase-in period (Burfisher et al., 2001). This may have prolonged the adjustment period, which is likely to be the case, especially in 'South-North' bilateral free trade agreement faced by Mexico and US. Second, the tequila crisis could contribute to the continuing surge of migration. The crisis severed the adjustment period of displaced Mexican workers due to NAFTA. The combination of strong economic performance of US (pull) and worsening economic condition of Mexico (push) enhanced the steady increase of migration from Mexico to US, in line with theory (Hatton, 2005; Hatton and Williamson, 2009; Tilly, 2011). Third,

the positive growth impact of NAFTA may enhance migration from people with higher education and skill levels. As argued by Burfisher et al. (2001) and Kose et al. (2004), NAFTA has a large positive impact on Mexico's economy. Although no consensus has been reached yet, several studies have found that Mexico-US migration is more positively selected (Chiquiar and Hanson, 2005; Orrenius and Zavodny, 2005; McKenzie and Rapoport, 2010). Increasing aspiration and capability may explain the increase in migration (de Haas, 2009). The case for this argument is even stronger for those in the middle- and upper-part of skill and education level who may reap the additional benefit of NAFTA-induced economic growth.

Meanwhile, a longer-run look into simple descriptive statistics of Mexico-US migration indicates that the migration-reducing impact of NAFTA has started to materialise in recent period. This gives the hint that the adjustment period due to NAFTA (the migration hump), exacerbated by financial crisis, may be close to end amidst increasing absolute number of migrants. Table 1 shows that between 1995 and 2000, migration from Mexico to US far exceeded the reverse. However, in 2005-2010, the data show that actually more people are moving from US to Mexico instead of the other way around. Mexico-US migration in 2005-2010 was less than half of it was in 1995-2000.

Although table 5.1. is purely descriptive, it gives a rather clear indication that the migration hump hypothesis which predicts 5 to 15 years of adjustment (hump) period may indeed explain what has happened to Mexico-US migration following the implementation of NAFTA. Figure 1 and table 1 provide early indication that following NAFTA, Mexico-US migration has been growing in earlier period and now has started to decline. The inclusion of Mexico as part of the next exciting emerging economies, such as MINT, could mean that going forward Mexico is heading toward migration transition, and becoming a rising migration destination country.[56]

[56] MINT countries are Mexico, Indonesia, Nigeria, and Turkey. This acronym is popularised by a former Goldman Sachs' economist Jim O'Neill, as the next cohort of uprising emerging economies after BRIC (Brazil, Russia, India, and China). BBC in January 2014 wrote a piece on MINT (http://www.bbc.co.uk/news/magazine-25548060).

Table 5.1. Mexico in Transition: Migration Flows (in million)

	1995-2000	2005-2010
Mexico -> US	2.94	1.37
US -> Mexico	0.67	1.39
Net Migration	2.27	-0.02

Source: http://www.nytimes.com/interactive/2013/09/22/world/americas/migration-to-mexico.html?_r=0

3. Related Literature

The traditional view of trade theorists is that trade liberalisation, in the context of South-North mobility, shall lead to less migration. This prediction is the implication of the neoclassical models proposed by Heckscher (1949), Ohlin (1933), Mundell (1957) and Stolper and Samuelson (1941). This model considers countries with different factor endowments –thus, fits well with the South-North dichotomy. Assuming that the country-pair possesses similar production functions (technology) and factors of production, under a free trade regime, the country will export the goods that uses intensively the abundant factor, vice versa. Under this scenario, capital-rich country (North) shall export capital-intensive goods more intensively whereas labour-rich country (South) exports more of labour-intensive goods.

Under the neoclassical trade model, if a tariff is imposed by capital-rich country against labour-intensive imports from labour-rich country, this will result in the rise of factor prices (wages) relative to other factor and goods prices in capital-rich country. To put it in a migration context, such event shall increase the wage differentials between capital-rich and labour-rich countries. Assuming that wage differentials serve as a trigger for migration, unfree trade regime shall increase migration. Conversely, a free trade regime shall reduce the push-pull factor to migrate from the 'South' to the 'North'.

This neoclassical model is likely to be the intellectual motivation for trade liberalisation policy such as NAFTA. As confirmed by the quotation above from former Mexican President Salinas, Mexican

government's stated policy goal is to export more of its goods instead of its people. In fact, as mentioned by Martin and Taylor (1996), the Commission for the Study of International Migration and Co-operative Economic Development established through 1986 IRCA concluded in their report that expansion of trade between US and migrant-sending countries is the 'single most important remedy' to reduce migration.

The rationale behind such policy is that by establishing freer or less-restrictive trade regime between US and migrant-sending countries, this shall promote 'specialisation', hence shifiting in production of labour-intensive goods to migrant-sending countries while capital-intensive goods production will be shifted to the US. Eventually, the wage level at migrant-sending countries shall experience an upward pressure, thus possibly reducing inter-country wage differentials and discouraging migration.

Neoclassical trade model has gone through some criticism due to its assumptions that are unlikely to be satisfied in the real world. Several later trade theorists thus attempt to further develop the neoclassical model by relaxing some of its assumptions. For instance, Markusen (1983) argues that trade and migration could be complements if the motivation for trade is other than difference in factor endowments. For instance, if trade happens because of technological differences, then trade and migration may no longer be substitutes. Such assumption may fit better in reality. It is not that easy to imagine that Mexico and US share the same technological level.

Martin and Taylor (1996) support the argument laid by Markusen (1983) by providing an illustration of a freer trade regime for grain between US and Mexico. Since US has more advanced technology in grain production compared to Mexico, this will lead to US grain producers to have a comparative advantage in grain production. As such, the removal of trade barriers for grain market might eventually lead to more migration since given US grain producers' comparative advantage due to their high-technology, labour displacement shall occur in Mexico, hence lowering the wage level in Mexico which will eventually lead to more migration from Mexico to US.

Schiff (1996) goes further to model the case where trade and migration become complements. He proposes three mechanisms to support his argument. The first model incorporates migration costs and financial constraints faced by potential migrants. Since trade liberalisation leads to higher general welfare, through an increase in employment and wages, this will relax the financial constraints faced by the financially constrained migrants –those who could have not migrate without higher income level.

The second mechanism is more relevant to high-skilled migration case. Schiff (1996) argues that assuming the existence of factor specificity in the form of signinicant adjustment costs –the cost to relocate factors from one economic sector to another-, trade liberalisation may lead to a temporary increase in unemployment or decrease in wages level in the sector being liberalised in the 'South' country. If one considers high-skilled migrants as more mobile internationally, these types of individuals may migrate more abroad if they are displaced because their sector is temporary 'distressed' due to trade liberalisation.

The third mechanism proposed is more relevant to the Mexico-U.S. case. Consider that in the majority of 'South' countries, labour-intensive sectors are the ones that are heavily protected. Schiff (1996) points out that in the mid-90s, agricultural import substitutes sectors in Mexico are notable cases where specific sectors still enjoyed the highest-degree of protection level. Since these sectors are more likely to be more labour-intensive than other tradable sectors, trade liberalisation may indeed lower wages, triggering more migration.

The relationship between trade and migration is not only substitutes or complements. Some scholars have argued that it could be both. We have seen that earlier scholars argue for the substitution relationship between trade and migration e.g. Mundell (1957), and further reconfirmed by Faini and Venturini (1993). On the other hand, some later scholars propose the possibility in which trade and migration are complements e.g. Markusen (1983) and Schiff (1996).

There is a third possible relationship in which both substitutes and complements effect take place if one decomposes the effect into short- and long-run. This phenomenon is called 'migration hump', in which temporary dislocations occur, and its persistence depends on the length of adjustment due to trade liberalisation. 'Migration hump' hypothesis was proposed by Martin and Taylor (1996) who argue that trade liberalisation may have two contrasting effect to migration. In the short- or medium-run, trade liberalisation may trigger more migration whereas in the long-run their relationship shifts to substitutes (migration hump). This somewhat 'hybrid' explanation borrows the theoretical rationale of both theoretical camps. However they incorporate a time-dimension by allowing the short- and long-run effect to differ. As such, there is always a reason for prolonged 'hump', which is called 'migration plateau' (Martin and Taylor, 1996; de Haas, 2010).

The 'migration hump' model does not explain much about the timing of the shift i.e. when the substitute effects of trade liberalisation will kick in. In general, Martin and Taylor (1996) and Martin (2005) believe the duration of the hump to be approximately 5-15 years. Furthermore, Martin and Taylor (1996) argue that the amplitude of migration hump is likely to be relatively small. This implies that in a long-run perspective, free trade does indeed reduce migration. The short-run migration pressure –the size of the 'hump'- depends on several factors. Both factors in 'North' and 'South' countries are important.

The size of the hump is affected by the comparative advantage of the 'North' after trade liberalisation takes place. The greater the advantage, for instance due to huge technological gaps or economies of scale, the more prolonged the hump will be. The size of migration hump also depends on how big the adjustment cost is for the 'South'. If the 'temporary wounds' due to trade liberalisation are deep and quite long, this means the adjustement costs are higher. Such event will end up in the prolongation of the migration hump ('migration plateau'). Martin (2005) provides three conditions that lead to migration hump: (i) continued demand-pull for migrants in the

destination country, (ii) an increased supply-push in the country of origin, and (iii) migration networks that can move workers across borders.

Theoretical models of trade and migration are inconclusive in their empirical predictions or policy implications regarding the impact of trade liberalisation on migration. Therefore, this conundrum of trade and migration relationship is more likely to be an empirical task. Nonetheless, such thing is not that easy to be explored. The main reason has been more on the migration data. Well-documented and well-harmonised data on international migration were scarce, let alone quality data on migration. Hence, empirical exercise to assess the impact of trade liberalisation policy on migration is quite a daunting task both methodologically and data-wise; thus some studies assessing the migration impact of NAFTA have relied more on *ex-ante* approach.

One example of *ex-ante* studies is Robinson *et.al.* (1993) that construct a computable general equilibrium (CGE) model to estimate the impact of NAFTA on Mexico-U.S. migration flows in a comparative-static framework. They find a dilemma in bilateral trade growth and labour migration relationship. Trade liberalisation leads to more migration, both Mexican internal migration and Mexico-U.S. migration. The case for reduction in Mexico-U.S. migration only happens if Mexican growth is more robust relative to U.S. growth and if Mexico do not revoke their farm support programs. There is a dilemma however, since more support to Mexican farmers leads to less bilateral trade growth. Accordingly, policy maker has to deal with this policy trade-off.

Another study that also performs simulation approach is, for instance, Faini and de Melo (1996) that employ a macroeconomic simulation and applies it to the case of Morocco. They show that trade liberalisation could yield a positive effect on employment in the migrant-sending country, hence reducing migration. In the case of Morocco, their estimates show that trade liberalisation reduces migration through two channels, these are higher domestic income and stronger employment growth.

Meanwhile, empirical *ex-post* studies on this matter are plagued both by the lack of data availability on international migration and methodological challenge to successfully isolate trade liberalisation policy. The implication is that the orientation of econometric exercises tend to lean more towards micro-level studies by exploiting survey data. Nevertheless, such approach is also limited by the fact that migration phenomenon is inherently self-selected. Consequently, this makes micro-level exercises e.g. survey-based studies are likely to suffer from self-selection problem, resulting in biased estimates. These challenges, both for macro-level and micro-level studies, lead to only a handful of statistical-approach studies that evaluate trade liberalisation such as NAFTA.

Meanwhile, the majority of macro-level studies that discuss migration and trade mostly focus on the impact of migration on trade. That is, whether more migration leads to more trade or in other words, the trade-creation effect of migration. As explained before, estimating trade liberalisation policy effect is a tricky task, and thus most empirical studies only incorporate and analyse the relationship between trade and migration –thus no where close to really investigate any policy effect.

One example that attempts to estimate the impact of NAFTA on Mexico-U.S. migration at the macro level is Melchor Del Rio and Thorwarth (2009). Using irregular migration as dependent variable and employing a distributed lag model, they do not find any significant impact of NAFTA on reducing irregular migration. They capture the effect of NAFTA by coding it as dummy variable. They do find the positive relationship between trade flows and irregular migration, however, the direction of causality is unclear and NAFTA impact is not significant.

Other NAFTA-related studies have been more micro-inclined. For example, Boucher et al. (2007) investigate the impact of various migration-related policy, including NAFTA on the supply of Mexican labour to U.S. farms. Coding the NAFTA effect as dummy variable, and incorporating it to a village-level survey data, and by employing the Arellano-Bond generalised method of moments (GMM) procedure, they find that NAFTA increases the supply to U.S. farms. Another village-

level study is Richter et al. (2007), by conducting a least square dummy variable (LSDV) method, that find a significant effect of NAFTA in reducing Mexico-U.S. migration. The inclusion of NAFTA is also by dummy variable. Both Boucher et al. (2007) and Richter et al. (2007) use the same data source: a randomised survey of Mexican village –Mexico National Rural Household Survey (ENHRUM), which means self-selection problem should be less an issue in their estimates.

As we can see, inconclusive findings are found in empirical studies related to impact of NAFTA on Mexico-U.S. migration. Moreover, the main challenge of policy evaluation still prevails. NAFTA is basically a policy intervention at the macro level with over-arching micro-effect. As such, macro-level policy assessment is a challenging task due to the non-experimental nature of macro-data. Evaluating NAFTA's impact on migration at the micro-level is also not an easy task due to the fact that the effect of NAFTA is not randomly distributed over sample. Even if the survey is randomly assigned, it is still impossible to separate the control and treatment based on NAFTA.

Thus, most empirical studies have relied on the traditional approach of dummy variable inclusion to the empirical model or alternatively rely on *ex-ante* simulations. This paper attempts to contribute to the current literature of trade and migration by conducting a macro-level policy impact assessment of NAFTA on migration, moving away from dummy variable approach, and instead go for data-driven event analysis suitable for comparative case studies i.e. synthetic control method.

4. Method and Data

This paper applies synthetic control method as its main method. In the presence of exogenous policy intervention and clear-cut control group(s), researchers can easily deploy comparative case studies. In the topic related to migration, one example is Card (1990) that analyses the effect of 1980 Mariel Boatlift on the labour market in Miami by using other Southern U.S. cities as control

group. However, some specific policy such as NAFTA is inherently specified at the macro-level. Therefore, it is not so easy to determine the appropriate comparison group.

Abadie et.al. (2010) propose a novel empirical methodology that may suit as an alternative tool for policy evaluation at the macro level: synthetic control method. Basically, the synthetic control method constructs a weighted combination of control units from potential pool of 'donors'. In our case, Mexico-U.S. migration is our treatment unit. Any other migration flows from other countries could be considered as potential donors for our 'synthetic Mexico'. As such, Canada-U.S. migration flows, as example, are hence excluded for consideration as donor because Canada is also affected by NAFTA policy (part of treatment).

In principle, synthetic control method aims to remedy several main drawbacks of the usual comparative case studies approach. First, synthetic control method provides more transparent and less ambiguous procedure in the selection of comparison. Traditional comparative case studies give space for a considerable case of ambiguity in its selection of control groups. Abadie et.al. (2010) state that in traditional comparative case studies method, 'researchers often select comparison groups on the basis of subjective measures of affinity between affected and unaffected units'. Therefore, synthetic control method offers a more objective procedure in the construction or selection of comparison group. Thus, it lets the data speak more and put subjectivity aside.

Second, synthetic control method is transparent and prevents extrapolation. It provides explicitly the relative contribution of each control unit in the construction of the 'synthetic unit' to assess the counterfactual. Furthermore, no extrapolation will happen because the sum of the weights of each control unit in the 'synthetic unit' will always equal to one.

One example in the use of synthetic control method went back to Abadie and Gardeazabal (2003) –at that time the name 'synthetic control method' was not yet introduced instead it was still classified a specific type of event studies. They analyse the economic costs of conflict in the Basque

region. Instead of subjectively choose one Spain region as comparative group –such as in Card and Krueger (1994) in their choice of Pennsylvania as comparison group and go for micro-level analysis, Abadie and Gardeazabal (2003) opt to focus at the more macro-level and thus develop a novel methodology which gives the way for the introduction of synthetic control method.

Another example in the use of synthetic control method is Abadie et.al. (2010) which gives the seminal theoretical and empirical example in the use of synthetic control method for comparative case studies in social sciences. That said, they contend that synthetic control method is a promising alternative option for social science researchers interested in a more data-driven comparative case studies method that is tranparent and more objective as well as more suitable for *ex-post* policy intervention evaluation at the macro level.

I follow Abadie et.al. (2010) to describe analytically how synthetic control method works. It is natural to consider that we have a panel data set up in which we have *i=1* to J cross-sectional unit observation, thus we have *J+1* units in *T* periods. Suppose our first unit *1* i.e. Mexico is exposed to policy intervention in *To*. Consider Y_{it} as the outcome that is observed for *i* at time *t*, so that we have the general model for all potential outcomes for all units as the following:

$$Y_{it} = \tau_{it} + \delta_t + v_{it} \qquad [1]$$

in which $v_{i,t}$ could be expressed by the following factor model:

$$v_{it} = z_i\theta_t + \lambda_t\mu_i + \varepsilon_{it} \qquad [2]$$

where τ_{it} is the dynamic treatment effects in which $\tau_{it} = 1$ if *i=1* and *t>To,* and $\tau_{it} = 0$ if otherwise. δ_t is common time period effect and $v_{i,t}$ is error. z_i is a vector of relevant observed covariates not affected by the intervention, θ_t is a vector of time-specific parameters, λ_t is a vector of unobserved common factor, μ_i is unit-specific unobservables, and ε_{it} is zero-mean transitory shocks at the unit level.

In the context of this paper, z_i is thus the predictors of migration flows as well as migration flows of any potential unit pre-NAFTA. The goal is to obtain estimates when *t>To*, thus post-intervention counterfactuals, which can be written as:

$$\alpha_{1t} = Y_{1t} - y_{1t}^{C} \qquad [3]$$

where Y_{1t} is already known thus we estimate its counterfactuals y_{1t}^{C}. α_{1t} is thus the gap in outcome variable between our treatment unit Y_{1t} and its synthetic control y_{1t}^{C}. In other words, α_{1t} is the estimated effect of intervention.

To do so, we define a a $(J \times 1)$ vector of weights for $W = (w_2, \dots, w_i)$ such that $w_i \geq 0$ and $\sum w_i = 1$. The first term ensures that all weight will be positive and the second term implies that the sum of the weight of all control units is equal to one. W thus incorporates the contribution of weights from potential pool of 'donor' units which is used to construct the synthetic unit or in short, a particular weighted average of control units.

Thus, incorporating the weights to estimate y_{1t}^{C} in [3] into [1] and [2], we can write the following equation to determine the estimates of the outcome variable for each synthetic control weighted by *W*:

$$\sum_{i=2}^{J+1} w_i Y_{it} = \delta_t + \theta_t \sum_{i=2}^{J+1} w_i z_i + \lambda_t \sum_{i=2}^{J+1} w_i \mu_i + \sum_{i=2}^{J+1} w_i \varepsilon_{it} \qquad [4]$$

Suppose there are $(w_2^*, \dots, w_i^*)$ such that the following conditions hold:

$$\sum_{i=2}^{J+1} w_i^* Y_{i1} = Y_{11}, \sum_{i=2}^{J+1} w_i^* Y_{i2} = Y_{12,} \dots,$$

$$\sum_{i=2}^{J+1} w_i^* Y_{iTo} = Y_{1To}, \qquad and \quad \sum_{i=2}^{J+1} w_i^* Z_i = Z_1$$

Then, we can rewrite [3] as the following:

$$\alpha_{1t} = Y_{1t} - \sum_{i=2}^{J+1} w_i^* Y_{it} \quad \text{for} \quad t \in \{T_o + 1, \dots, T\} \qquad [5]$$

The computation of $w^*$is then used to minimise the distance $\|X_1 - X_c W\|$ where X_1 is the vector of pre-treatment characteristics and X_c is its synthetic counterpart.

The main drawback of synthetic control method is that it does not provide statistical inferences normally used in large data set panel estimation. This comes unsurprisingly since most often we likely to end up with relatively small number of control units to construct the synthetic unit. Abadie et.al. (2010) suggest to conduct a battery of placebo studies to evaluate the significance of synthetic control method estimates.

The idea of placebo test is to perform the synthetic control algorithm sequentially to every country in the donor pool of our potential control units, and compare the placebo results with our baseline treatment unit estimates. That means we treat other control units as if they had been exposed to the intervention.

If the placebo studies result in gap pattern relatively identical to the synthetic control estimates, then our estimated intervention effect does not provide significant evidence. In other words, the results of our synthetic control estimation are likely to be driven by chance. On the other hand, if our synthetic control result yields distinct pattern compared to the placebo results, then we can confidently argue that our results are valid. In the case of this paper, if the result of our synthetic Mexico is not significantly different from placebo results, then the policy effect is not likely to be valid.

Another important thing is the precision of pre-intervention synthetic control. This aim is to construct a synthetic control which as precisely as possible fits the treated unit in pre-intervention period. A poor fit between the synthetic control and the treated unit for pre-interventon period

brings the implication that any post-intervention gap is likely to be driven artificially by the lack of fit rather than policy intervention (Abadie et al., 2010). In this case, inferences from synthetic control approach may be erroneous.

The data for this paper are taken from various sources: MOxLAD, World Bank, Penn World Table, CEPII, and DEMIG database. I initially limit the selection of countries to 20 Latin American countries, including Mexico, based on MOxLAD database. In synthetic control approach, it is not advisable to simply pool all available units as potential donors. In our case, pooling all countries in the world is actually a sub-optimal decision. Large degree of heterogeneity in the potential pool of donors may induce interpolation bias, even if the synthetic control has a good fit with the treated unit. Abadie et al. (2010) suggest to limit the potential donor pool to units that share similar characteristics to the unit exposed to policy intervention. This argument supports our decision to limit our sample for Latin American countries only.

After merging the dataset, I had to drop Paraguay, Cuba, and Haiti from the potential control unit pool of countries due to missing data for some predictor variables. Thus, I ended up with 17 Latin American countries in total for 1974-2010 period. Therefore, we have a sufficient post-intervention period to assess short- and long-run effect of NAFTA on Mexico-US migration. The outcome variable of interest is annual migration flows to the US as share of sending country's population compiled by the DEMIG project of the International Migration Institute. Definition of variables and sources are provided in appendix.

5. Results

Before I conduct the synthetic control, it is useful to start with simple regression model. The regression shall complement the descriptive statistics presented before in which we are interested whether we can get some hints of migration hump. I only use Mexico data for this analysis. To capture the possibiltiy of migration hump hypothesis, I introduce the squared-term of NAFTA

trend.[57] I also control for the potential effect of the 1990s Tequila Crisis.[58] Given that we have time-series regression, I run ordinary least squares (OLS) regressions with Newey-West standard errors so that the standard errors are consistent in the presence of heteroscedasticity and autocorrelation. The regression is basically an AR(1) model. The results are presented in table 5.2.

Table 5.2. AR(1) Regression for Mexico-US Migration

	Dependent Variable			
	Log of Migration		Migration Rate	
Independent Variable	Coefficient	Newey-West S.E.	Coefficient	Newey-West S.E.
Log of Migration (lagged)	-0.093	0.197		
Migration Rate (lagged)			-0.106	0.153
Population Mexico	1.980	1.956		
NAFTA trend	0.149***	0.048	0.018***	0.004
NAFTA trend squared	-0.006***	0.002	-0.001***	0.000
1990s Financial Crisis	0.110	0.109	0.002	0.013
F-Stat	68.94***		21.57***	
Observations	44		44	
Time Trend	YES		YES	
Constant	YES		YES	

From table 5.2, we find some evidence of a hump-shaped effect of NAFTA. These findings do not change if I use different measure of migration flows. However, the magnitude of squared term of NAFTA trend is pretty small. This indicates a somewhat prolonged positive impact of NAFTA on Mexico-US migration flow. According our simple AR(1) model, the inflection point of NAFTA's impact occurs after 12-14 years. Hence, our regression exercise further supports the

[57] NAFTA trend is defined as time trend following NAFTA's implementation. Thus, 1994=1, 1995=2, 1996=3, and so forth.
[58] Tequila Crisis dummy is defined as 1 for 1994-2000, and 0 otherwise. This categorisation follows Reinhart and Rogoff (2009).

descriptive statistics discussed previously. I will compare this regression finding with our counterfactual analysis using synthetic control method.

We shall deepen our analysis by conducting the synthetic control method. The first step is to construct synthetic Mexico. To do so, I use the other 16 Latin American countries. The intervention date for our baseline estimate is 1994. This is based on the fact that as early as January 1994, trade liberalisation measures due to NAFTA have started to put into effect. Boucher et.al. (2007) point out that some agricultural commodity trade was already liberalised in that month. Hence, putting 1994 as our policy intervention date seems to be a reasonable choice.

However, one may rise the question to the choosing of 1994 as policy intervention date. Is it really the case that NAFTA is the only migration-related policies taking place in 1994? Is there any other non-migration or migration policies started effectively in 1994? Certainly, for the concern to qualify, such policy has to be considered as having nation-wide impact on Mexico-U.S. migration flows.

Massey and Pren (2012) show that there were two restrictive enforcement operations launched by the US Department of Homeland Security in 1993 (Operation Blockade) and 1994 (Operation Gatekeeper). Furthermore, they state that these measures were heavily publicized, 'including official releases, press conferences, and saturated media coverage' in addition to being broader in its scope. Certainly, we would expect that such restrictive migration measures would affect more on irregular immigration flows. Nevertheless, such measures might deter any potential migrants, including potential regular migrants, from migrating at all.

Another issue, and perhaps more interesting, is the fact that in December 1994, Mexico started to encounter the episodes of the peso crisis (tequila crisis). The value of peso depreciated by around 50 percent in just around six months. As we have discussed, theory shows that economic slump

in origin country may trigger more migration. Thus, the tequila crisis might provide a slight nuisance in our estimates.

To reduce the risk of having multiple opposing interventions in our exercise (broader control vs free trade and tequila crisis) and also considering the expectation that broader implementation or impact of NAFTA took some time to kick in, I also use 1995 as the intervention point. This also serves as further robustness check of intervention date selection, to see if our results are robust to slight changes in intervention date.

To construct the synthetic Mexico-US migration flows, I rely on traditional variables used in gravity models of international migration: GDP percapita and distance. I also include measure to proxy migration networks i.e. migration stock for the 1980 and 1990. These basic gravity variables are then supplemented by various economic variables of the origin country that may characterize and determine migration flows to the US. I include measure of income inequality i.e. share of income owned by the top 20 percent of population. The inclusion of this variable is relevant because within-inequality is an important determinant of international migration as well as migration selection.

Next, I also include the measure of foreign direct investment. This variable is highly relevant as it serves as key migration determinants in the trade and migration literature, and is embraced by both the neoclassical and world systems theory. Another variable is public education spending. The inclusion of this variable is important because education, an important ingredient to support human development, may affect migration decision. Especially, if the nation is lacking accessible private education provision, as is the case in many developing countries. The final variable to be included is domestic credit to GDP as a proxy for financial development. The inclusion of this variable allows us to also apply the rationale from new economic of labour migration, in which missing credit markets is considered as the central cause of migration.

As depicted in table 5.4., for 1994 as intervention date, our synthetic control is constructed from Costa Rica and Dominican Republic (model 1). Using 1995 as intervention point gives us additional set of country donors: Argentina and Venezuela (model 2). The weights of countries in synthetic Mexico and the value of pre-intervention variables for synthetic Mexico are given in table 5.4. Only Costa Rica and Dominican Republic appear in both models as donors. Costa Rica consistently shows up as large contributor in both models with nearly 90 percent and 32 percent share of the synthetic control weight (W^*) in model 1 and model 2, respectively. Dominican Republic also consistently contrbutes between 13-19 percent in both models. In model 2, Argentina is the top donor with 44 percent weight.

The results of our synthetic control estimates are given in figure 5.2. and figure 5.3. The fit of synthetic Mexico pre-NAFTA appears to be excellent. In figure 5.3., I employ 1995 as intervention date. Overall, both model 1 and model 2 have very small values of the root mean squared prediction error which indicates that our synthetic control estimations are valid and reliable.

In general, the results indicate that post-NAFTA period, migration flows to the U.S. from Mexico increased with around 1-year policy lag with a 'hump' like shape. In both models, the result hints that the complementary effect of NAFTA on migration took place around 1-year after the initial implementation of such trade liberalisation. The hump duration is estimated to be approximately 15 years. Thus, our hump estimates confirm Martin and Taylor (1996) theoretical conjectures of the 'migration hump' duration. This hump-like shape is clear to see in figure 5.4. when I plot the estimated effect for each year. As can also be infered from figure 5.4., model 2 displays a slightly faster move towards the substitution impact of trade liberalisation after 15 years of the implementation of NAFTA. The qualitative interpretation though remains the same. If the pattern we see in our synthetic control estimates continues, *ceteris paribus*, we should expect that after 2010, regular labour migration flows to US should follow a decreasing trend (trough episode).

The size of the hump (average hump amplitude) is around 0.07 percent (measured as migration flows share to total population). Given the average value of migration share for our sample is 0.08 percent, this means that the estimated NAFTA effect is large. However, we need to take into account that our intervention date coincides with the tequila crisis. Therefore, the rapid surge of migration following NAFTA is likely to be further strengthened by the crisis.

Unfortunately, it is impossible to separate NAFTA and the financial crisis effect. However, we can be sure about our estimates because given the fact that NAFTA has 15-year phase-in period, this means the effect of NAFTA is staggering and is fully captured in the long-run pattern of our estimates. Meanwhile, the effect of the tequila crisis is not likely to have longer persistence.

This conjecture is supported by the financial crisis episodes collected by Reinhart and Rogoff (2009). As we can see in table 5.3., Mexico was basically in a combination of financial crises in 1994-2000. What initially started as peso crisis (currency crisis) evolved into multitude of financial crises such as inflation crisis and banking crisis. This series of financial crises further strengthen our argument that the prolonged migration hump as well as the relatively large size of the hump are corroborated by the crises. In other words, the financial crises experienced by Mexico made the post-NAFTA adjustment period longer and more severe. It triggers more push-factors to migrate to the US and creates the migration hump.

To further check the role played by tequila crisis in prolonging the migration hump, I look into the financial crises indicators collected by Reinhart and Rogoff (2009) for other Latin American countries that construct our synthetic Mexico. As depicted in table 5.4., our baseline synthetic Mexico, the one with the lowest root mean squared prediction error, is constructed from Costarica (86.9 percent) and Dominican Republic (13.1 percent). The financial crises database show that Costarica financial crises period was only present in 1994-1996 as opposed to a more prolonged crises period in Mexico as shown in table 5.3. Meanwhile, for Dominican Republic, the type of financial crisis they experienced was sovereign domestic debt crisis -the type of crisis that Mexico

did not encounter. These differing patterns experienced by Mexico and the countries that constructed our synthetic Mexico corroborate our conjecture that the tequila crisis prolonged the migration hump.

Table 5.3. Mexico: Post-NAFTA Episodes of Financial Crisis

Year	Currency crises	Inflation crises	Stock market crash	Banking crises	Crisis tally
1994	1	0	1	1	3
1995	1	1	1	1	4
1996	0	1	1	1	3
1997	0	1	0	1	2
1998	1	0	1	1	3
1999	0	0	0	1	1
2000	0	0	1	1	2
2008	1	0	1	0	2

Source: Reinhart and Rogoff (2009). 1=crisis, 0=no crisis

Following the economic crisis, in 1995 total unemployment in Mexico rose to 6.9 percent compared to only 4.2 percent in 1994 based on ILO data. Interestingly, this spike in unemployment rate is attributed to youth unemployment (15-24 years of age). In 1995, youth unemployment in Mexico was 11.2 percent in contrast to merely 7.0 percent in previous year. As younger population in productive age has more propensity to migrate and the presence of strong Mexican migrant network in the US, it is no surprise that migration flows went up. The adjustment lags and costs related to trade liberalisation i.e. NAFTA hence amplifies the incentives to migrate.

Another issue is factor specificity. The structure of labour supply may not respond swiftly to the adjustment and displacement due to NAFTA. Agricultural workers cannot be transformed immediately into manufacturing workers. Given the lack of protection and missing credit markets typical in developing countries, these segment of population hence have more incentives to migrate (Martin and Taylor, 1996).

It is also important to note that the predicted decline of Mexico-US migration flows in figure 5.4. may not all be driven by the long-run substitution impact of trade on migration. The sharp drop in predicted migration flows occurred in the late 2000s. This implies that the weakening migration pull factors from the destination (United States) due to the subprime mortgage crisis seem to also contribute to the steep drop of Mexico-US migration.

How confident are we with our findings? We employ placebo studies to assess the validity of our results. As can be seen in figure 5.5., we can detect that our estimates have quite distinctive pattern compared to other placebos. The shape resembles a hump with considerable amplitude. After 1-year lag for the impact to kick-in, trade and migration are complements following trade liberalisation. In the long-run, trade and migration relations becomes more of a substitute.

To further check the validity of our synthetic control method, I follow Abadie et.al. (2010) by conducting more restrictive placebo estimates. Countries with pre-NAFTA mean squared prediction error (MSPE) two times higher than Mexico's are dropped.[59] Therefore, our placebo exercise will only be based on countries that have similar pre-NAFTA MSPE values as our synthetic Mexico. In other words, I drop estimates for countries with poor fit in the pre-intervention period. Thus, we now compare Mexico with other placebo estimates that have similar good fit. Figure 5.6. clearly shows the distinct pattern of our Mexico's estimated gap. This corroborates our conviction on the validity of our estimates using synthetic control method.

To sum up, synthetic control method confirms the findings based on simple regression analysis conducted earlier (table 5.2.). I find the non-linear impact of NAFTA on Mexico-US migration in a hump-like shape relationship. The inflection point, nevertheless, differs slightly. Our estimates using synthetic control method shows 15 years of hump period compared to 12-14 years using AR(1) regression model. However, since synthetic control method is basically a counterfactual

[59] These countries are Dominican Republic, Nicaragua, Panama, and El Salvador.

scenario analysis, we can be confident about the effect of NAFTA. The magnitude of NAFTA impact is amplified by the Tequila Crisis which took place almost at the same period. The prolonged hump is explained by the lengthy crisis period suffered by Mexico as well as the 15 years phase-in period of NAFTA.

6. Conclusions

To sum up, in this paper I present the evidence of 'migration hump' phenomenon in Mexico-U.S. migration flows pattern following NAFTA. The placebo estimates also show that the hump shape is a considerably distinct property of synthetic Mexico which shows the robustness of our results. This paper provides the empirical support for the 'migration hump' model following trade liberalisation as proposed by Martin and Taylor (1996).

There is caveat regarding the choice of intervention date. The official kick off year of NAFTA, 1994, would be a natural choice. Nevertheless, given the restrictive migration policy measures conducted by US in 1993-1994 to control Mexico-U.S. border which may deter all kind of potential migrants, thus this policy event might provide a nuisance. Hence, I also use 1995 to check for the robustness of our baseline results, and this action does not change our findings. Both 1994 and 1995 intervention dates accommodate the dual events happening in the same year: NAFTA and tequila crisis. However, these two events are likely to point to the same direction. That is, trade liberalisation initiates economic adjustment that creates migration hump. Then, the presence of financial crisis magnifies the size of the hump and prolongs the duration of the hump. However, as the effect of NAFTA lingers in the long-run due to the 15-years phase-in period, once the effect of tequila crisis subsides in post-2000 period, the remaining effect on migration is largely dominated by NAFTA.

In this paper, I show that NAFTA is an excellent case of exogenous policy intervention as it provides us with a 'quasi-natural experiment' to evaluate policy impact. This paper has presented

robust evidence on the presence of 'migration hump' regarding trade and migration relationship following trade liberalisation policy such as NAFTA. This paper shows that the relationship between trade and migration is not as simple as complements vs substitutes. In the presence of 'migration hump', we may see a short-run complements and long-run substitutes relationships between trade and migration. Thus, the policy implication of this paper is that it will be quite wishful thinking to believe that the opening of trade barriers between developing and developed countries will immediately result in migration reduction. The case is stronger if the countries have strong migration history and network such as US and Mexico. As we have shown in this paper, the migration-reduction impact will need time to materialise.

Table 5.4. Synthetic Control Method Results: Weights and Control Units

Predictors	Model 1: 1994			Model 2: 1995		
	Mexico	Synthetic Mexico	All controls[a]	Mexico	Synthetic Mexico	All controls[a]
Public Spending on Education	2.755	4.714	3.148	2.829	2.890	3.139
Income share owned by top 20%	46.593	49.713	56.300	49.168	51.029	56.188
Foreign Direct Investment, Net	1.022	1.668	0.847	1.098	1.149	0.914
Domestic Credit to GDP	19.586	20.865	30.874	20.494	23.160	30.837
Log GDP per capita	9.134	8.847	8.508	9.139	8.855	8.510
Log Distance	7.392	8.123	8.439	7.392	8.531	8.439
Migrant Stock in US, 1980	3.157	1.552	1.042	3.157	1.123	1.042
Migrant Stock in US, 1990	5.164	1.982	2.079	5.164	1.541	2.079
Relative Weight (W*)		Model 1: 1994			Model 2: 1995	
		Costa Rica	0.869		Argentina	0.442
		Dominican Rep.	0.131		Costa Rica	0.321
					Dominican Rep.	0.187
					Venezuela	0.050
Root Mean Squared Prediction Error		0.024			0.026	

[a]Average of all control countries in specified pre-intervention period

Figure 5.2.: Synthetic Control Method, Intervention in 1994

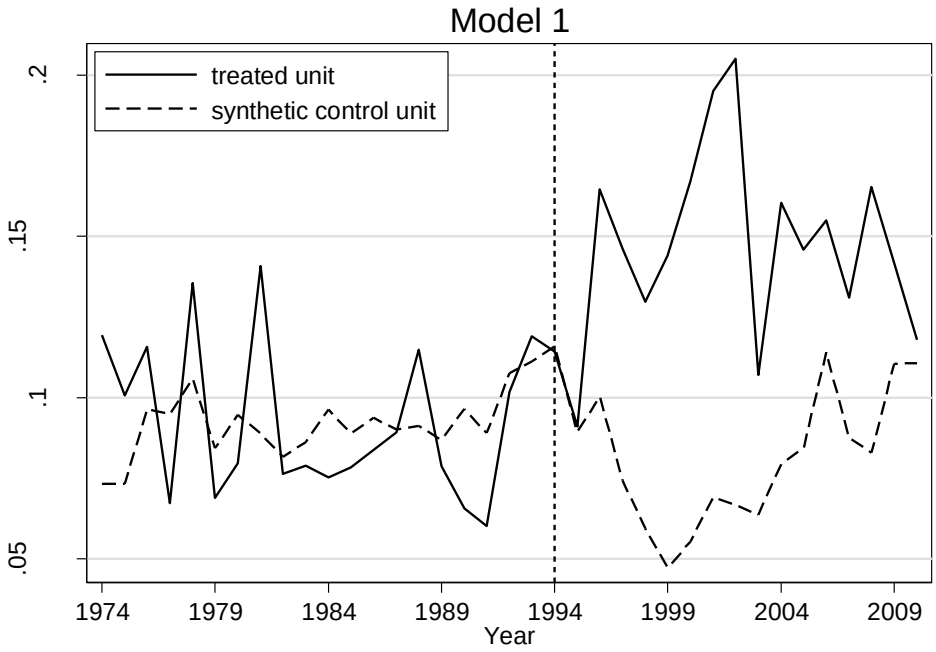


Figure 5.3.: Synthetic Control Method, Intervention in 1995

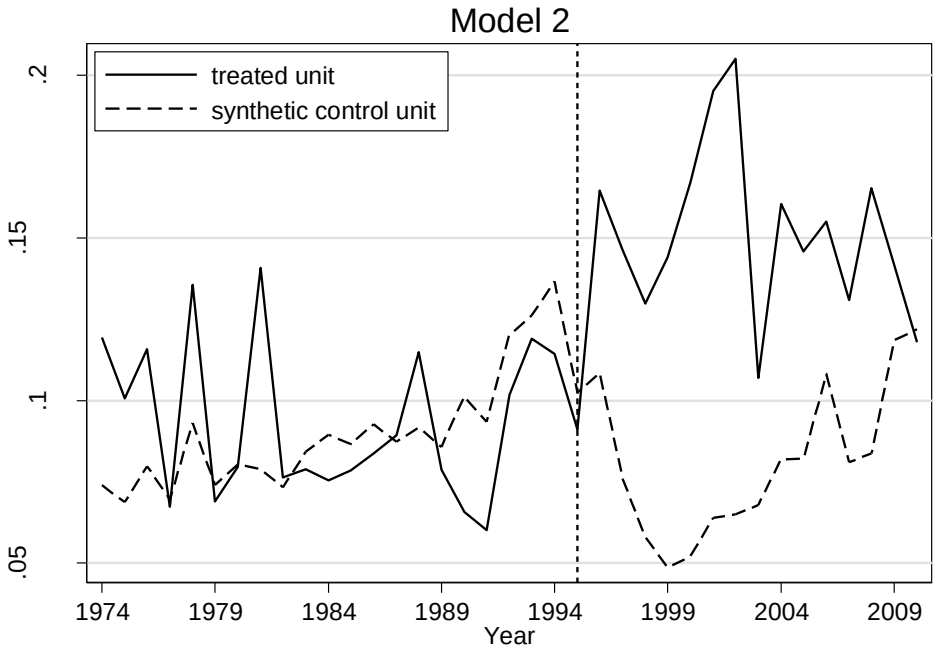
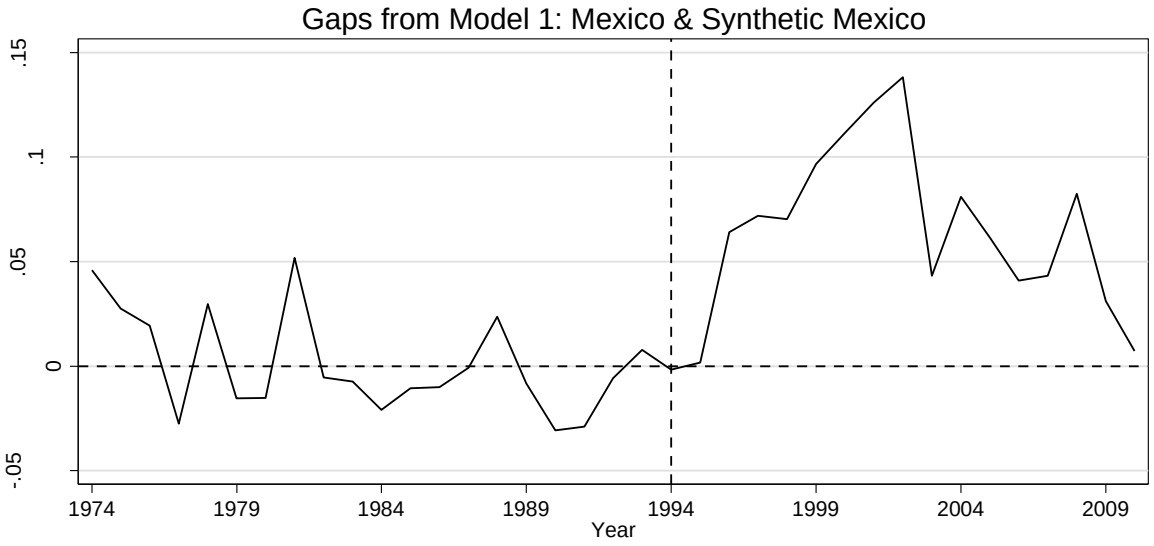


Figure 5.4.: Estimated Gaps between Mexico & Synthetic Mexico



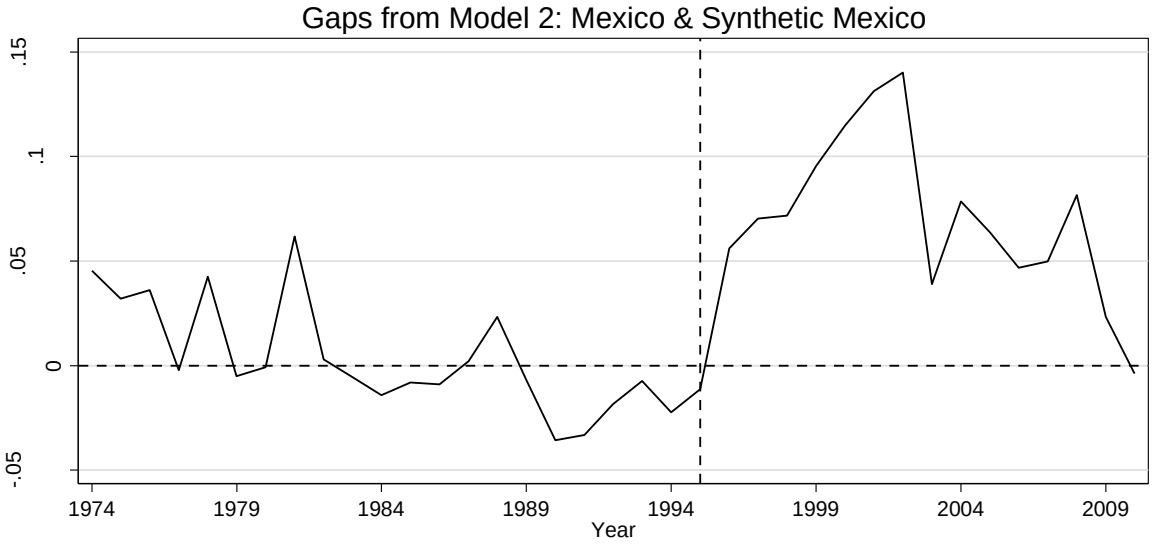


Figure 5.5.: Placebo Simulation Results

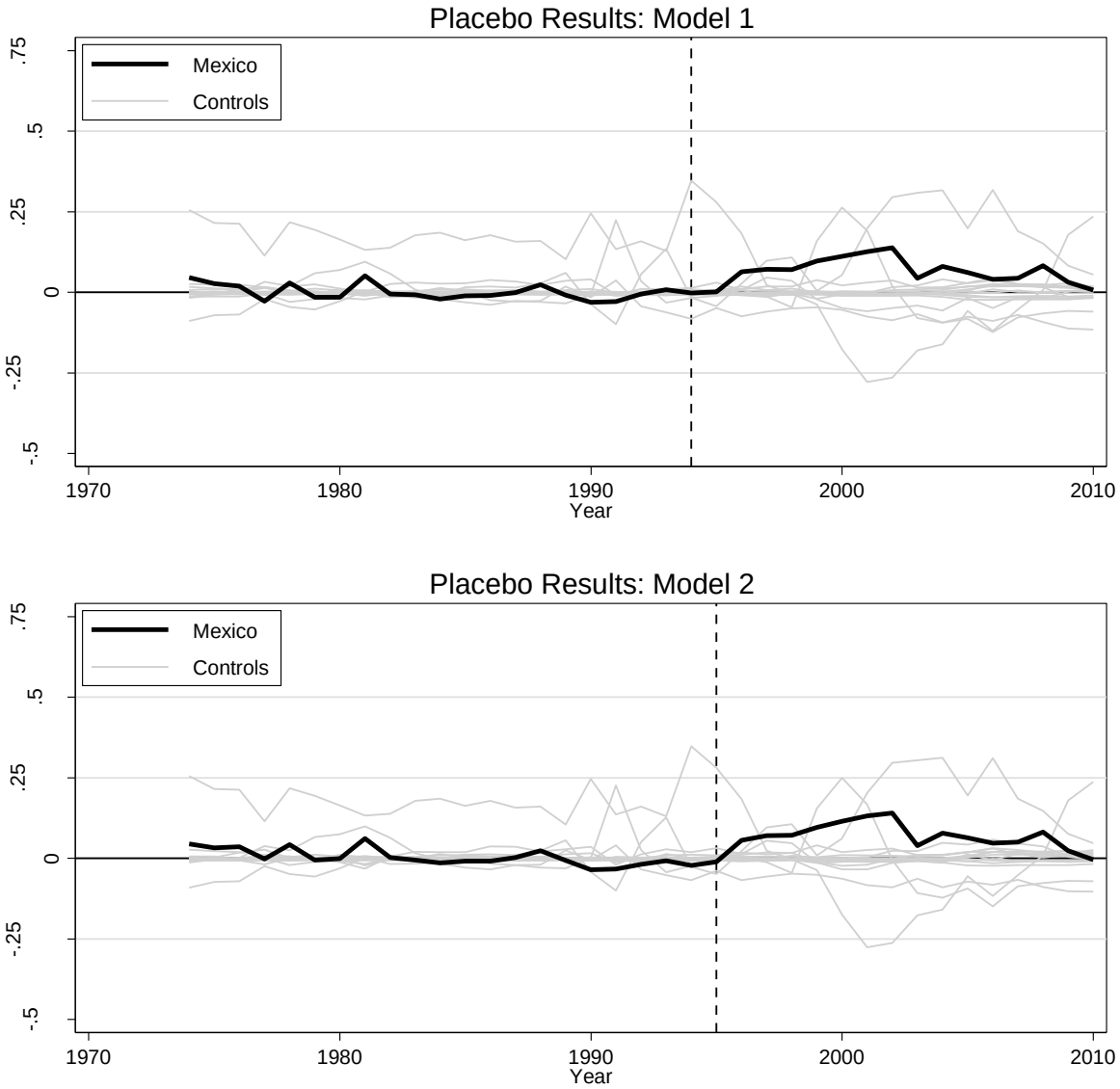
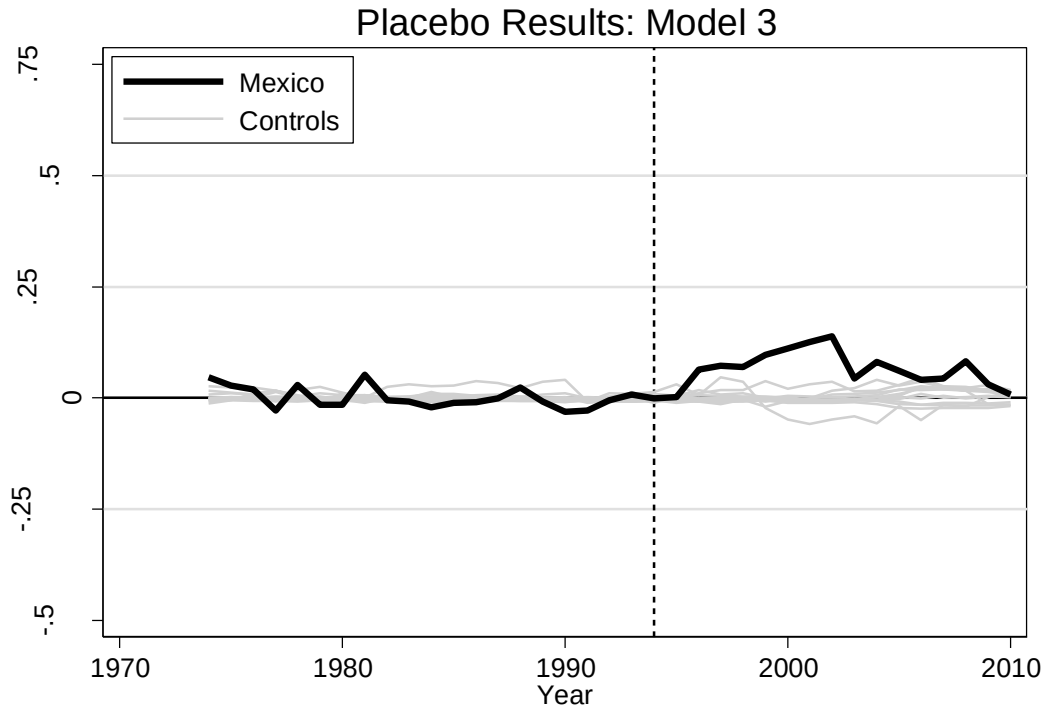


Figure 5.6. Placebo Simulation Results: Discard Countries with Pre-NAFTA MSPE Two Times Higher Than Mexico's



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APPENDIX

Variables Description and Sources

Predictors	Sources
Foreign Direct Investment, Net Inflows (% of GDP) Domestic Credit to GDP (% of GDP) Income share owned by highest 20% Migrant Stock in US (% of total population)	World Bank
Log GDP per capita	Penn World Table
Log Distance	CEPII
Migrant Flows to U.S., annual (% of total population)	DEMIG
Public Spending on Education (% of GDP)	MOxLAD

List of Latin American Countries Included in the Analysis

Argentina
Bolivia
Brazil
Chile
Colombia
Costa Rica
Dominican Rep.
Ecuador
El Salvador
Guatemala
Honduras
Mexico
Nicaragua
Panama
Peru
Uruguay
Venezuela

Chapter 6

Concluding Remarks: Lessons Learned and Policy Implications

Each core chapter has provided detailed and in-depth conclusions regarding each research questions. Therefore, this chapter shall only provide broad-brush remarks on the lessons learned from this thesis' findings and the policy implications for both social and trade policies. I would like to start by briefly revisiting the key questions and aims of the thesis. Then I touch upon the contribution of this thesis to the literature, discuss the limitations, provide the general findings and policy implications and conclude by discussing implications for future research.

Revisiting Aims and Key Questions

The main motivation of this thesis is to further understand the answer on the question of "why people migrate" Migration literature has heavily borrowed one basic tenet from the economics literature that assumes humans as *homo economicus* who always maximise their decision-making processes through rational behaviours. One implication of such assumption is that migration decisions are taken, mainly, as part of the income maximisation motive of individuals. People decide to migrate in the quest for better living. Hence, so long as inequality persists such as due to income and wage gaps, according to this assumption, individuals will always opt to migrate to new locations in which better incomes and wages are available.

Accordingly, development has been a major player in migration research and discussion. Conventional wisdom holds that better development will result in lowering migration incentives for individuals as incomes and wages gaps narrow. Some policymakers even went boldly by stating that development is indeed the *panacea* for migration. Only recently that scholars and policymakers alike realise that development *per se* will not stop migration. The consequences of globalisation, as

characterised by greater connectivity both physical and non-physical and cheaper transportation costs, have resulted in a more mobile world with mobility patterns that are getting more complex. Also, countries and regions are even more interdependent on one another. In other words, development will not stop migration.

In this thesis, I attempt to look beyond the development-migration nexus in the discussion of migration determinants. It is thus more appropriate to view migration as part of development processes. As people's well-being and livelihood constantly improving over time, their capability to be mobile will also be stronger. Therefore, in the discussion of development-migration nexus, I contend to take development as outcomes. The answers may lie more in the 'inputs' for development such as policies and institutions. They are critical in shaping people's behaviours and decision-making processes. Surprisingly, the literature has been very lacking in the discussion of how development inputs like policies and institutions influence and shape migration decisions, stocks, and flows.

The majority of migration literature looks at how migration policies and institutions influence migration. The field needs to expand further by also embracing the roles of non-migration policies and institutions. Indeed, they may both directly and indirectly affect and shape migration. I opt to specifically look into social and trade policies and their potential roles as migration determinants. Hence, this thesis also adds the migration literature by enriching the discussions regarding migration determinants by its attempt to circumvent the black box of development-migration conundrum debate and instead chooses to puts its focus on the 'inputs' factors for development such as policies and how they play their roles as migration determinants.

Contribution to the Literature

I noted six challenges in contemporary migration research. This thesis is able to contribute to the literature on five of those challenges. First, I manage to argue for the importance of non-migration

policies as migration determinants. These are structural factors that often play significant roles in shaping migration decisions at the micro-level and migration stocks and flows at the macro-level. Notwithstanding the focal role of migration policies, the direct and indirect impact of non-migration policies such as social and trade policies may indeed have equal or even greater impact on migration. For instance, this thesis proposes that reverse welfare magnet plays significant role as migration determinant.

Second, this thesis successfully showcases the feasibility and richness a research can deliver if one attempts to incorporate both internal and international migration simultaneously in their analyses. The goal of bridging internal and international migration should not be the overtly ambitious dream of establishing a 'grand theory' of migration. Instead, the sole goal of putting these two types of migration together should be to enrich our empirical stories and analyses. More importantly, the simultaneous analysis of internal and international migration may also help in bridging the divisions of scholastic traditions in which internal has traditionally been more of the avenues for urband and regional studies scholars whereas migration scholars have historically been more focused on international migration. Hence, the bridging of internal and international migration in theoretical and empirical research may also promote interdisciplinary discussions.

Third, this thesis has showcased that impact evaluation of policies on migration is possible to be conducted, both in micro- and macro-levels. The main challenges in evaluating policy impact on migration has always been the non-experimental nature of policies. In fact, most data are indeed observational. These challenges hamper the causality inferrences of policies on migration. Nonetheless, recent advances in empirical methods, especially related to policy and impact evaluation, allow scholars to engage in more quantitative approaches with efforts to tease out causality and impact inferences to the maximum extent. In this thesis, I employ empirical methods that can, to some extent, provide estimates of effects both for micro- and macro-level analyses.

Fourth, this thesis managed to reconcile structure and agency debates in migration literature. Functionalists migration theories have often been accused of neglecting structural factors. On the other hand, structural theories have been said to ignore the agency of individuals. I contend that migration research needs to bridge these competing views and tries to combine them into empirical analyses. This implies that multilevel analysis which incorporates different levels of unit of analysis should be the way forward. In other words, empirical research should strive to collect, use, analyse, and utilise empirical data with multilevel dimensions. Multilevel analyses allow us to include all levels of unit of analysis: micro-, meso-, and macro-levels.

Fifth, this thesis argues that migration scholars need to embrace fully the fact that migration is indeed a complex phenomenon. Many factors determine migration at different levels and migration also influences other factors. Hence, the key issue is how we can engage and embrace the complexity of explanations. Large-N statistical studies have often been accused of simplifying explanations whereas small-N qualitative studies have been thought to be severely lacking in providing us with compelling external validity. I contend that migration scholars need to embrace new theoretical avenues and empirical approaches that can give us more complex explanations. A number of methods such as qualitative comparative analysis, network analysis, and agent-based modelling are some examples.

Limitations

This thesis has no such aim to propose a 'grand theory' of migration determinants. From the outset of this thesis, I clearly state that this thesis in general focuses on the South-North migration and, to some extent, internal migration. Therefore, the findings of this thesis may not be applicable to other instances, situations, and types of migration or migration corridors. The macro-level chapters of the thesis, certainly, carry a considerable amount of external validity. However, the micro-level analysis obviously provides stronger internal validity instead of external validity.

Another limitation of this thesis is that it only discusses social and trade policies. It is not the aim of this thesis, for instance, to discuss and analyses the effects of migration policies. As mentioned in the aim and key questions of this thesis, my goals are to understand more about the 'inputs' for development and their roles as migration determinants.

General Findings and Policy Implications

First, based on the empirical findings of this thesis, I argue that origin (developing) countries' policies matter. In this thesis, I have attempted to incorporate sending country's dimensions to the most possible extent as I could. In chapter 2, by utilising full bilateral data specification, the impact of sending country's determinants such as the reverse welfare magnet is unequivocally strong. In chapter 3, cash transfers programs and universal access to social services are shown to be robust determinants of migration.

Migration scholars have long neglected the central role of both structural and agency powers of the sending country. The bias was understood due to lack of data availability. However, with more quality data available for less developed and developing countries, more attention should be put into understanding how various structural, interventional, or individual factors in the sending countries interplay with migration.

Second, I show that non-migration policies are important migration determinants. Policy makers in advanced countries have long spent their time to debate on how to tweak and twist existing migration policies to manage migration better. However, this thesis shows that non-migration policies such as social and trade policies matter much. The evidence brought by this thesis hints the way for policymakers to embrace a 'softer' approach in managing migration. Instead of pursuing migration or border policies that could trigger perverse reactions, 'soft-tuning' through non-migration policies may in turn be a more effective instrument to manage migration.

Third, in relation to social policy, Chapter 2 clearly shows that the push-pull power of welfare provision is not only the monopoly of receiving advanced countries. This thesis shows the theoretical and empirical evidence for reverse welfare magnet. That said, a more comprehensive and effective welfare provision, especially in developing countries, shall provide the 'soft-tuning' instrument for managing migration. Chapter 3 brings evidence on the effectiveness of the directed welfare programs in influencing migration decision. Nevertheless, policymakers need to recall that cash programs, as this thesis shows, directly affect financial constraints of individual and households. Therefore, as shown in chapter 3, should policymakers look into managing migration, one needs to decide between universal vs directed welfare services and programmes. This thesis shows that financial constraints matter in migration decision so welfare programs and services need to be carefully designed to provide the right nudge as intended.

Fourth, in relation to trade policy, this thesis shows that the key measures of capital linkages affect both migration and brain drain. Chapter 4 provides multiple pathways that explain the causes of high migration and brain drain. This thesis shows that capital linkages are not at fault for brain drain or high emigration. I show that weak and bleak domestic economy prospect is key causal condition for high migration rates and brain drain. Therefore, policymakers should devise policies that could benefit from the presence of capital linkages. Embracing trade openness will result in goods, services, and capital inflows which should brighten the prospect of the domestic economy, thus making it easier to manage migration.

This thesis also shows that free trade has dynamic effects on migration. It is beneficial in the long-run for all countries to embrace greater freedom in goods, services, and capital flows. However, as shown in Chapter 5, there are bumps and disruptions along the way. Politicians may not have the long-term view in seeing the overall benefit of trade agreements. But policymakers should be wise and see the longer-term benefits in the form of increased general welfare. Certainly, mitigation instruments to soften the short- and medium-run bumps are imperative.

Implications for Future Research

First, I contend that methodological pluralism matters. This thesis shows that the by using multiple theoretical approaches, models, and methods, we can get a much richer findings and point of view on the complexity of migration determinants. In Chapter 3, a multilevel modelling setup allows us to conduct various robustness checks and interactions that enrich our understanding in the process of finding the answers for our research questions.

Methodological pluralism also gives the opportunity for researchers to embrace the complexity of answers and explanation. Fuzzy set, for instance, aims for middle range answers whereas double-design large-N quantitative approach hunts for grandeur significance. In future research, the bridging and marriage of these approaches may provide not only answers but also further puzzles that should trigger continouous search of knowledge.

Second, future research studies need to incorporate spatial dependence notions in their empirical analyses. Migration, by itself, inherently brings spatial dimension. Hence, it is only appropriate if empirical studies also take spatial issues in their analyses. I argue that we need to explicitly take into account spatial dimensions such as spatial dependence in empirical analyses. As such, the potential use of spatial econometrics that allows us to incorporate direct spatial effects on our migration determinants models. Recent advances in spatial econometrics also open the avenues for spatial models that also take into account endogeneity issues.

Third, future research needs to fully embark in the interplay between migration and other non-migration policies and institutions. I have showcased in this thesis that non-migration policies matter and are critically important migration determinants. Future research has to look into the multitude of non-migration policies and institutions and their dynamic interactions with migration decisions, stocks, and flows.

Concluding Remarks

Linking development and policies to migration is never an easy task. The complexity that it entails makes migration research develops as an exciting, multidisciplinary field. However, methodological segmentation and fragmentation has led to many reductive and rather close-minded arguments because different disciplines do not talk to one another. This thesis fully embraces methodological pluralism in theory and methods and shows that rich evidence and explanations are not yet obsolete.