

Essays on the Economics of International Migration and Return

by

Paolo Martin F. Abarcar

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Public Policy and Economics)
in The University of Michigan
2016

Doctoral Committee:

Professor Dean C. Yang, Chair
Assistant Professor Achyuta R. Adhvaryu
Professor Brian A. Jacob
Professor Jeffrey A. Smith

© Paolo Martin F. Abarcar 2016

All Rights Reserved

For Hyejin and my parents

ACKNOWLEDGEMENTS

I would like to acknowledge the support of people who made the completion of this dissertation possible. First and foremost, I thank my committee members. I am especially grateful to Dean Yang whose guidance at all stages of my research was invaluable; he knew when to impart encouragement when it was needed. I thank Jeff Smith. No one reads drafts as meticulously as Jeff and his comments substantially improved the final product. Ach Adhvaryu and Brian Jacob often made themselves available to help me think through details, which was crucial to moving forward. I could not have formed a better team to support my research.

It was the friendship of fellow graduate students that sustained me throughout graduate school. I am grateful to Chris Boehm and Nitya Pandalai-Nayar. Second year was a particularly tough time for me, but they kept me sane through their dinner parties and the “love shack”. Prachi Jain had weekly coffee with me, allowing me to share day-to-day joys and frustrations, plus the occasional gossip. These were cathartic and kept me calm. Minjoon Lee was always a good neighbor to me. I thank him for helping me work through microeconomic theory, and for being key to my meeting my wife.

I received excellent research assistance for my first chapter from Carlo Robert Mercado, Katherine Peralta, Donald Bertulfo, Jan Fredrick Cruz, Samantha Coronado, Louise Oblena, Christopher Ordonez, and Ricky Guzman. My third chapter is joint work with Caroline Theoharides, who was quick to respond, despite her busy schedule. The Department of Economics and the Rackham Graduate School at the

University of Michigan provided generous funding and support for my research.

My interest in studying international migration comes from my own experience as an immigrant, but also owes to Michael Clemens, who convinced me that it is a topic worth studying. Back when I was a new immigrant to the U.S., Michael opened doors for me by hiring me as his research assistant at the Center for Global Development. His passion for the topic was what led me to graduate school.

My deepest thanks go to my wife, Hyejin, and my parents, Carol and Edgar. No words can fully express how their love and encouragement has meant to me. Both my parents sacrificed careers in the Philippines to move to the U.S. so that my siblings and I can have better opportunities. The completion of this dissertation, in a way, is their success.

TABLE OF CONTENTS

DEDICATION	ii
ACKNOWLEDGEMENTS	iii
LIST OF FIGURES	vii
LIST OF TABLES	viii
LIST OF APPENDICES	x
ABSTRACT	xi
CHAPTER	
I. Do Employers Value Return Migrants? An Experiment on the Returns to Foreign Work Experience	
1.1 Introduction	1
1.2 Background	4
1.2.1 The Wage Premium to Return Migrants	5
1.2.2 Resume-Audit Studies in Labor Economics	6
1.2.3 The Philippines as an Excellent Setting	8
1.3 Experimental Design	9
1.3.1 Creating a Bank of Work Experiences	10
1.3.2 Choosing Job Ads and Generating Fictitious Resumes	10
1.3.3 Random Assignment of Foreign Experience	12
1.3.4 Responding to Job Ads and Recording Callbacks	13
1.4 Summary Statistics	14
1.5 Results	15
1.6 Mechanisms	20
1.6.1 Negative Signaling	20
1.6.2 High Expected Wages	24
1.6.3 Overqualification	26
1.6.4 Low Expected Tenure	27
1.6.5 Location-Specific Human Capital	27

1.7	Discussions with Employers	29
1.8	Conclusion	32
II.	The Return Motivations of Legal Permanent Migrants: Evidence from Exchange Rate Shocks and Immigrants in Australia	52
2.1	Introduction	52
2.2	Theoretical Framework	56
2.2.1	Lifecycle Consumers	57
2.2.2	Target Earners	58
2.3	The Asian Financial Crisis of 1997 and its Impact on Australia	60
2.4	Data and Descriptive Statistics	62
2.5	Empirical Results	65
2.5.1	Main Result	66
2.5.2	Differential Effects by Intention to Return	67
2.5.3	Are Exchange Rate Shocks Merely a Proxy for Other Macroeconomic Variables?	68
2.6	Robustness Checks	70
2.7	Conclusion	74
III.	The International Migration of Healthcare Professionals and the Supply of Educated Individuals Left Behind	92
3.1	Introduction	92
3.2	Background	95
3.2.1	The Philippines and Nurse Migration	95
3.2.2	Nurse Migration to the U.S. in the 2000s	96
3.3	Data	98
3.4	Empirical Strategy	100
3.5	Results	102
3.5.1	Results from the Basic Difference-in-difference	102
3.5.2	Results from Exploiting the 2007 Policy Change	105
3.6	Discussion	106
	APPENDICES	117
	BIBLIOGRAPHY	130

LIST OF FIGURES

Figure

1.1	A Global Mapping of the Estimated Stock of Overseas Filipinos (Top 10 Destination Countries)	36
1.2	Callback Rate By Resume Treatment Status	37
1.3	Callback Rate vs. Length of Foreign Experience	38
1.4	Kernel Density Plot of the Wage Residuals of Migrant vs. Non-migrant Households	39
1.5	Coefficient Estimates By Years of Foreign Experience	40
1.6	Fewer Callbacks for Resumes with Foreign Experience at all Expected Wage Levels	41
2.1	Foreign Exchange Rates of the Top 15 Home Countries of Australian Immigrants	77
3.1	Enrollment in Tertiary Education (2001-2012) By Discipline	108
3.2	Graduation in Tertiary Education (2001-2012) By Discipline	109
3.3	Number of Departures of Nurse and Other Migrants (2000-2012)	109
3.4	Pre-trends in the Nurse Migration Rate Across Provinces by Base Share Quartile	110
3.5	Pre-trends in the Nurse Enrollment Rate Across Provinces by Base Share Quartile	110

LIST OF TABLES

Table

1.1	Top 10 Countries of Destination of Permanent, Temporary, and Irregular Migrants in 2012	42
1.2	Distribution of Overseas Filipino Workers (in percent)	43
1.3	Countries of Foreign Experience of Resumes in the Audit Study . .	43
1.4	Summary Statistics	44
1.5	Randomization Tests	46
1.6	The Effect of Foreign Experience on Callback Rates	47
1.7	The Effect of Having Foreign Experience on Callback Rates By Firm Industry	48
1.8	The Effect of Foreign Experience on Callback Rates By Quality of Resume	49
1.9	The Effect of Cover Letters	50
1.10	The Effect of Foreign Experience at the Extensive and Intensive Margins	50
1.11	Comparing Treatment Effects of the Main and Sub Experiment . . .	51
2.1	Descriptive Statistics for the Sample of Immigrants	78
2.2	The Top 15 Source Countries with Mean Exchange Rate Changes Experienced	81
2.3	Reasons for Sample Attrition	82
2.4	The Effect of Exchange Rate Shocks on Permanent Return Migration	83
2.5	The Effect of Exchange Rate Shocks by Intention of Return	84
2.6	Are the Exchange Rate Shocks Merely Capturing the Effect of GDP per Capita Growth and Changes in Unemployment in Home Countries?	85
2.7	Are the Exchange Rate Shocks Merely Capturing the Effect of Changes in the General Price Level in Home Countries?	86
2.8	The Effect of Future Exchange Rate Shocks on Permanent Return Migration in the Prior Period	87
2.9	Are the Effects of the Exchange Rate Shocks Contemporaneous? . .	88
2.10	The Effect of Exchange Rate Shocks on Permanent Return Migration for the Trimmed Sample	89
2.11	Expect to Emigrate to Another Country?	90
2.12	The Correlation Between the Attrition Variable and the Exchange Rate Shocks	91

3.1	Descriptive Statistics	111
3.2	Effect of Nurse Migration on Tertiary School Enrollment and Graduation Rates	112
3.3	The Lagged Effect of Nurse Migration on Tertiary Enrollment and Graduation Rates	113
3.4	Effect of Nurse Migration on Tertiary School Enrollment and Graduation Rates (in birth province)	114
3.5	Robustness Checks for the Effect of Nurse Migration on Tertiary School Enrollment	115
3.6	The Effect of the 2007 Policy on Nurse Migration Rates and Enrollment	116
A.1	List of Colleges and Universities	119
A.2	Robustness Check of the Effect of Foreign Experience on Callback Rates	120
A.3	The Effects of Foreign Experience on Callback Rates, By Each Year Spent Abroad	121
A.4	A Tabulation of Recruiter Responses to the Interview	122
C.1	Effect of Nurse Migration on Tertiary School Enrollment and Graduation Rates (without including province specific linear time trends)	128
C.2	The Effect of the 2007 Policy on Nurse Migration Rates and Enrollment	129

LIST OF APPENDICES

Appendix

A. Chapter 1 Appendices 118

B. Chapter 2 Appendices 124

C. Chapter 3 Appendices 127

ABSTRACT

Essays on the Economics of International Migration and Return

by

Paolo Martin F. Abarcar

Chair: Dean C. Yang

International migration and return are important channels through which individuals from migrant-sending countries stand to benefit from the world economy. Yet to date, the consequences of such flows and the reasons behind why people move from one country to another remain poorly understood. This dissertation examines three interrelated questions concerning the economics of why people go abroad and why they might return, and then looks at the consequences of such decisions.

The first chapter investigates whether or not domestic employers value the foreign work experience of migrants when they return home from abroad. While experts often view return positively as a “brain gain” for a country, it is unclear if domestic employers in fact value work experience abroad. I conduct an audit study in the Philippines, sending over 8,000 fictitious resumes in response to online job postings across multiple occupations. Resumes are randomly assigned varying lengths of foreign work experience, among other things. Employers appear to disfavor return migrants: workers with foreign experience receive 12 percent fewer callbacks than non-migrants, with callback rates even lower for those who have spent a longer time

abroad. I test possible explanations and find that, consistent with employer interviews, location-specific human capital is important to employers, and the value of this human capital deteriorates as a worker spends time away from the domestic economy.

The second chapter discusses why migrants, who are allowed to permanently stay in their host countries, might decide to return to their home countries in the first place. I utilize exogenous exchange rate shocks arising from the 1997 Asian Financial Crisis to distinguish return motivations of Australian immigrants. A 10 percent favorable shock (a depreciation in home country currency) leads to a 0.37 percentage point reduced likelihood of return in the next two years. The effect is stronger for those with pre-existing intentions to return, weaker for those undecided, and zero for those who initially desired to stay. The results favor a life-cycle explanation for migrant behavior and reject the theory that migrants are target earners who seek to invest upon return.

The third chapter, joint with Caroline Theoharides, considers brain drain, the migration of skilled professionals, which is a chief concern for many developing countries. Especially when it involves healthcare professionals, a predominant view holds that international migration is responsible for the scarcity of healthcare workers in many developing countries, contributing to poor health outcomes for their populations. This chapter challenges prevailing wisdom by demonstrating how international migration may, in fact, lead to human capital formation. We focus on nurse migration from the Philippines and exploit the aggressive recruitment policies conducted by the US in the 2000s for causal identification. Using administrative microdata on migrant departures, we find that the large nurse outmigration during the period led to large subsequent increases in enrollments and graduations for tertiary education in many provinces. We find that the resulting increase in human capital was large enough that, in the end, there might not have been a reduction but an increased supply of higher educated individuals remaining in the country. The results are consistent with

a model of human capital formation where high prospective returns to skill in foreign countries incentivize individuals to acquire education.

CHAPTER I

Do Employers Value Return Migrants? An Experiment on the Returns to Foreign Work Experience

1.1 Introduction

With over 232 million individuals living outside their countries of birth¹, return migration is a potentially large phenomenon. Experts often cite “brain gain” as its chief benefit: migrants not only bring back their original human capital but also new skills, social connections, and experience acquired in foreign countries.² But whether or not domestic employers in fact value foreign work experience in production processes at home is unclear. Skills learned abroad may be irrelevant. Worse, absence from the local labor market could be detrimental if the skills employers value depreciate as a migrant spends time abroad. To what extent do employers actually value the foreign work experience of a returning migrant?

I conduct an audit study in the Philippines, sending over 8,000 fictitious resumes

¹United Nations (2013) <http://esa.un.org/unmigration/documents/The_number_of_international_migrants.pdf, accessed Jan. 2, 2015>

²Numerous policy reports on international migration mention these benefits of return migration. See for example this report of the UN Secretary-General on International Migration and Development <<http://www.refworld.org/docid/44ca2d934.html>, accessed Jan. 6, 2015>. See also IOM (2008) and Dayton-Johnson et al. (2009).

in response to online job ads. The experimental approach is akin to resume-audit studies now standard in labor economics. Resumes describe typical Filipino workers with similar backgrounds, except I randomly vary resumes to possess different lengths of foreign work experience. I target low and high skill employment ads in sales, administrative, construction, finance, and IT job categories. Callbacks for an interview by an employer are recorded for each resume. Because foreign work experience is randomly assigned across resumes, the basic analysis compares callback rates between those who had varying work experience abroad with those with only domestic work experience. This provides a causal estimate of the value of foreign work experience, as perceived by home country employers.

The main finding is that employers do not appear to value work experience abroad; in fact, they seem wary of it. Job applications with foreign work experience receive 12% fewer callbacks than otherwise identical job applications (2.8 percentage points of the mean callback rate of 24%). In addition, the callback rate appears to decrease as workers spend a longer time abroad instead of in the home country. A variety of regression specifications confirm the robustness of these results, and the negative effect is consistent across industries. The results persist when looking at subsamples of only high- or low-skilled job applicants. Employers disfavor return migrants over non-migrants with comparable skill, experience, and educational background.

I consider potential explanations for why employers do not prefer return migrants. I exploit how declared expected salary, the quality of resumes, and cover letters were explicitly varied among job applications to distinguish between explanations. I present evidence that the following play, at best, a minor role: first, that employers perceive return migration to be a negative signal, indicating negative selection into migration or failure abroad; second, that employers believe return migrants demand high wages; third, that employers think return migrants are overqualified; and fourth, that employers believe return migrants have high job turnover rates.

I argue that a fifth possible explanation, the depreciation of location-specific human capital, appears to be most plausible. Employers value workers who have experience in local production processes. But the value of this location-specific human capital deteriorates as workers spend time away from the local economy. I present suggestive evidence from a sub-experiment to support this claim, showing that return migrants experience better outcomes once they have spent time working again in the domestic economy, after their return. Moreover, interviews with HR personnel corroborate this finding with a number sharing that “. . . the longer an overseas worker works abroad, he/she may find it hard to adjust with local work culture/environment.”

Such findings stand in contrast to prior work, which generally finds large but varied labor market returns associated with return migration. Past empirical work measures the wage premium enjoyed by return migrants. Estimates of the wage premium range from between 0 to 40%, when comparing wages of return migrants to non-migrants in survey data. Yet these estimates have difficulty accounting for potential selection biases. Return migrants may be positively selected out of traits employers might also value. It is difficult to determine whether the higher wages of return migrants arise out of the real effect of foreign work experience or by some other characteristic of return migrants, which an employer observes but the researcher cannot control for. Especially in the context of international migration, Gibson, McKenzie and Stillman (2013) highlight how the selection bias is exacerbated by a “triple selectivity problem”³: there is selection on who migrates, who returns among those who migrate, and who participates into wage employment among those who return. Selection may explain why estimates of the wage premium vary from study to study. While this resume-audit study does not estimate a wage premium, the approach deals with the selection problem by comparing outcomes associated with foreign work experience in otherwise identical workers.

³Gibson, McKenzie and Stillman (2013) use the term “triple-selectivity problem” in a slightly different context but their insight about the selection problem in migration applies here.

In the end, my results cast doubt on the view that foreign work experience is the main channel through which return migrants produce gains for the home country. Other channels exist, of course, through which return migrants might bring value to the origin country: through their foreign education, their savings earned abroad, their entrepreneurial mindset, or their increased expectations of better political institutions at home. The focus here on work experience and domestic employers though is relevant to the extent that labor migration characterizes most of international migration. For example, most working-age immigrants in OECD countries are employed; the average employment rate of the immigrant population aged 15-64 is 64%, only slightly lower than native-born residents (OECD 2014). Temporary labor migration programs all over the world are commonplace, and under such schemes receiving countries impose time-limited contracts on foreign workers that strictly enforce return to origin countries.

This research offers an alternate perspective on the design of return migration programs. Providing generous financial incentives to attract nationals living abroad to come home has often been the focus of such programs. But my results suggest that efforts to reintegrate returning migrant workers to help ease them back into the workforce in the origin country may deserve attention. This may especially be true for the Philippines, which participates in numerous temporary labor migration programs with other countries. As the Philippine migration system is often seen as a model worldwide, these results would interest governments of other migrant-sending countries as well, seeking to engage in active labor force migration and circulation.

1.2 Background

In this section, I describe the existing literature on the returns to foreign work experience, provide a brief background on resume-audit studies, then argue that the Philippines is an excellent setting to conduct an audit study on the value of for-

oreign work experience. While resume-audit studies have their weaknesses, the approach overcomes the selection problem often insufficiently addressed in past non-experimental studies of return migration.

1.2.1 The Wage Premium to Return Migrants

The literature on return migration typically emphasizes human capital accumulation abroad as the main channel through which a migrant contributes to her home country upon return. A migrant acquires new skills and connections, and increases her productivity by working abroad, which makes her valuable upon return. Dustmann, Fadlon and Weiss (2011) present a formal theoretical model underpinning this argument.

Empirical studies have tested this human capital accumulation model but focus on estimating the wage premium by using non-experimental data to compare the wage paid to return migrants to observationally similar individuals who have never migrated. The findings vary considerably from study to study. Co, Gang and Yun (2000), for example, find a large wage premium of 40% for returning migrant women in Hungary but find none for men. In contrast, Barrett and Goggin (2013) estimate that male Irish returnees earn 7% more than comparable stayers, but not women. Reinhold and Thom (2013) find that for every year of experience in the US, earnings increase by approximately 2.2% for migrants who return to Mexico.

An important limitation of such studies is the difficulty of sufficiently controlling for selection on unobserved characteristics relevant to the labor market. Migrants are not randomly drawn from the home country population and neither are return migrants from the current stock of the diaspora. A further complication is that migrants who return may select into wage employment based on certain characteristics unobserved by the researcher. If return migrants appear similar to non-migrants in the data for a researcher but in fact look very different to employers, then factors

unseen to the researcher may account for the difference in observed wages between the two groups, and not foreign experience (Gibson, McKenzie and Stillman 2013). Even the direction of the resulting bias is difficult to identify.

The aforementioned studies try to account for the selection problem by modeling selection decisions but rely on possibly restrictive assumptions. The typical approach involves estimating a bivariate normal selection model in the spirit of Heckman (1979). For example, Co, Gang and Yun (2000) estimate participation into employment or migration by using variables such as age, marital status, and place of residence at age 14. Barrett and Goggin (2013) utilize the unemployment rate in an individual's county of residence at the time of graduation to explain selection into migration. It is questionable, however, whether these variables satisfy the exclusion restriction necessary for such models to hold. While age, marital status, and place of residence do explain migration or employment, they are factors that are likely to be related to a person's wages as well in other ways. This audit study offers an alternate way to confront the triple selectivity problem by experimentally varying overseas experience in otherwise identical resumes.

1.2.2 Resume-Audit Studies in Labor Economics

The experimental setup in this paper closely follows the design of a long list of past audit studies in labor economics. The setup's key advantage is that the researcher is able to control everything that employers observe about job applicants in generated resumes. Therefore, differences in resume outcomes, typically callback rates, can be credibly attributed to an experimental variable, holding other things constant by randomization. Researchers have examined a rich set of topics with this design. To name a few: Bertrand and Mullainathan (2004), Oreopoulos (2011), and Booth, Leigh and Varganova (2012) investigate the effect of race on employment outcomes; Kroft, Lange and Notowidigdo (2013) and Eriksson and Rooth (2014) look at the adverse

effect of unemployment spells on outcomes; while Deming et al. (2014) focus on the value of postsecondary credentials in the labor market. The innovation in this paper is in applying the method to focus specifically on foreign work experience.

Some disadvantages to the approach, however, are worth mentioning.⁴ One disadvantage of resume-audit studies is that interview callback rates are the measured outcome, instead of actual job offers or wages. If actual job offer rates are the reverse of interview callback rates then the results using callbacks could be misleading. Second, the measured effect may only indicate employer perceptions about job applicants. If employers have wrong beliefs, then differences in callback rates may not necessarily reflect true differences in worker productivity. Third, disparities in interview rates, however accurately measured, may not be large enough to translate into meaningful differences in economic outcomes between workers.

Nevertheless, resume-audit studies provide a good window into the workings of the labor market. While only interview callback rates are measured, callback rates are found to empirically map directly to job offer rates, at least for in-person audit studies in the US (Mincy 1993). Whereas employer perceptions may be mistaken, incorrect beliefs are unlikely to persist in labor markets over time in a competitive market (Aigner and Cain 2013). Especially if decisions made by employers are based on previous experience working with similar workers, employer perceptions can reflect true productivity differences between workers. While interview callback rates may not be believed to be economically meaningful, a study by Lanning (2013) demonstrates that even seemingly small differences in hiring rates can lead to non-trivial wage gaps, when calibrating a search model using data from well-known audit studies.

⁴The disadvantages of audit studies in the context of discrimination studies listed by Heckman and Siegelman (1993) and Heckman (1998) are perhaps the best known, although most of their critique applies to audit-pair studies that use actors that stand in as “live” job applicants in interviews. Resume-audit studies, which rely on sending fictitious resumes only, overcome some of the limitations these authors mention but are still subject to a number of weaknesses.

1.2.3 The Philippines as an Excellent Setting

The Philippines provides an excellent laboratory to study migration. Home to an estimated 10,489,628 migrants around the world⁵, the country is one of the largest migrant-sending nations in the world with almost 11% of its population abroad. International labor migration has had a long history: since 1974, the Philippine government has facilitated and promoted temporary overseas employment. Rough estimates suggest that there are over 3.5 to 4.5 million return migrants in the country (Wahba 2015). Given how commonplace departure and return is, employers are unlikely to find it strange to receive job applications with foreign experience. The setting reduces the possibility that the experiment’s results are based on mistaken perceptions of employers having little experience with return migrants.

The design of this study reflects the tendency of Filipinos to migrate to a diverse set of countries. Figure 1.1 portrays the spread of Filipino migrants amongst the top 10 destination countries in 2012, while Table 1.1 provides the numbers by migration category. The US is a major destination, hosting over 40% of the stock of total migrants, with most migrants recorded under the “permanent” category (i.e. with visas allowing indefinite stay). “Permanent” migration is most prominent in western countries like the US, Canada, Australia, and the UK. On the other hand, “temporary” migration garners a significant share as well. This refers to legal migration often facilitated by the government through licensed recruitment agencies. Workers go abroad with contracts of specified lengths, typically 2 years, with the potential for renewal (Theoharides 2014). The Middle East, including countries like Saudi Arabia and the United Arab Emirates (UAE), are the main destinations. Neighboring countries to the Philippines are also popular, such as Malaysia, Hong Kong, and Singapore. Finally, “irregular” migration is estimated to be the least common. “Irregular” migrants refer to those without valid residence or work permits, or who are overstaying in the

⁵From the Commission on Overseas Filipinos 2012 Stock Estimates.

foreign country. The government estimates “irregular” migrants to be around 13% of the stock of overseas Filipinos. In the audit study, resumes with foreign experience are randomly assigned foreign countries in a way that mimics the distribution of the stock in migrant destinations.

That Filipinos work in a variety of jobs abroad informs the selection of the 5 job categories considered in this study. Table 1.2 presents the distribution of migrant workers by major occupation group as taken from the 2013 Survey of Overseas Filipinos.⁶ Occupations known as high-skilled – managers, professionals, and technicians – represent a fair amount of workers while lesser skilled positions – clerks, sales workers, and laborers – are sizeable as well. To reflect this distribution, I consider construction, finance, IT, sales, and administrative job categories in this study, with the first three representing jobs with high skill requirements. While not fully representative of occupations taken up abroad by Filipinos, the five categories comprise some of the most in-demand occupations in the Philippines, with the highest number of job postings per month in the job websites considered in this audit study.⁷ It was necessary to select job categories with a high frequency of new job openings, in order to send a sufficient number of resumes in a given period of time.

1.3 Experimental Design

This section describes in greater detail the experimental design as implemented by the research team: how we created a bank of work experiences to use in generating fictitious resumes, how we chose job ads to apply to, how we randomly assigned foreign work experience between resumes, and how we responded to job ads and recorded

⁶The Survey of Overseas Filipinos is a nationally representative survey conducted by the National Statistics Office annually. The survey interviews migrant households in the Philippines and gathers information on their family members who have gone abroad, their remittances, their occupation, and their place of work, among other things.

⁷The Bureau of Local Employment lists accountants, civil engineers, programmers, and sales clerks as some of the most in-demand occupations in the Philippines. <<http://www.ble.dole.gov.ph/pjf/2013-2020In-demandandHard-to-fillOccupations.pdf>, accessed Jan. 8, 2014>

interview callbacks.

In total, we sent over 8,000 resumes in response to 2,000 job ads in Metro Manila over the course of 6 months. The pilot study occurred in April 2014 while the full study was implemented from June to September 2014. Except for the automation of parts of the procedure in the full study, none of the steps changed between the pilot and full study.

1.3.1 Creating a Bank of Work Experiences

We began by building a repository of work experiences that served to represent employment experiences of actual Filipino job seekers. We gathered resumes from job websites for individuals looking for work in our selected industries. To avoid compromising current jobseekers, we collected resumes that had been posted more than 3 years ago. We extracted information on company names, job titles, and job responsibilities and used these as a basis for crafting fictitious resumes.

1.3.2 Choosing Job Ads and Generating Fictitious Resumes

We utilized two of the most popular job websites in the country. We considered all employment ads falling under the sales, administrative, construction, finance, and IT job categories. We restricted ourselves to jobs in the National Capital Region (NCR), ignoring ads from companies that conceal their identity (“Company Confidential”) or ads that are associated with staffing agencies that recruit workers for other employers.

For each job ad, we made four resumes and web profiles in the associated job website. Care was taken to make resumes distinct from one another to avoid suspicion from employers. Filipino names were randomly selected from a list of common names taken from the Census. Postal addresses were randomly assigned based on real streets in Metro Manila lifted from the phone book. Each profile was given a unique e-mail address. We varied resume templates used for each resume based on 15 different

designs.

We tailored resumes to satisfy minimum job requirements listed by the job ad. We constructed distinct work histories by building from our bank of work experiences, indicating technical skills where necessary. Work histories always indicated experience relevant to the job posting. For example, if the posting was for a sales position, resumes all indicated past positions in sales, marketing, or retail.

We randomized on key elements:

1. Gender: For each job in the sales, finance, and IT job categories, we randomly assigned two applicants to be male and two to be female. For administrative positions, we made all applicants female. For construction jobs, we made all applicants male. Females and males, respectively, overwhelmingly hold these latter two positions.
2. Quality: We assigned two resumes to be high quality and the rest to be low quality. While all resumes were tailored to match minimum job requirements, high quality resumes were designed to be superior. First, high quality resumes listed one of the top four universities in the Philippines as their alma mater. Low quality resumes were assigned a random college or university drawn from all but the top four.⁸ Second, we included relevant technical skills beyond requirements in high quality resumes. For example, if an engineering position required proficiency in AutoCAD, high quality resumes were designated to have additional skills in Primavera or Staad Pro while low quality resumes only indicated AutoCAD. Last, high quality resumes were constructed to have two more years of work experience than low quality resumes.
3. Expected Salary: The job websites we used allowed a job applicant to declare an expected salary for the position being applied for. They also allowed a

⁸For a full list of universities used, please refer to Table A.1 of the appendix.

company to reveal a salary range for the job they are hiring for. We randomize the expected salary indicated in our four job applications to be within the salary range indicated by the job ad. If a company declared no salary range, we made an estimate of the appropriate range.

Research assistants were allowed to choose the total number of jobs held for the four resumes, provided that it was equal for the pair of low quality resumes and for the pair of high quality resumes. Total years of experience were based on the minimum years required by the job. As mentioned, low quality resumes received the minimum while high quality resumes received two additional years (however, these would be adjusted again after the assignment of years of foreign work experience). We designed all resumes to have no unemployment spells. The age of each applicant is determined by years of work experience plus 21 years.

1.3.3 Random Assignment of Foreign Experience

Once the set of resumes was prepared, we randomly assigned two of the four resumes – one low quality and one high quality – to include foreign work experience. We modified these resumes to include a recent work experience abroad. The added work experience is for an occupation that is in the same industry as indicated in the job ad. Typically, we changed the details of the last job held or added another job to the work history using our bank of work experiences. We used real foreign company names obtained via internet searches.

For the two foreign resumes, we randomized length of foreign work experience in years according to a discrete uniform distribution on the interval [1,10]. Country of foreign experience was randomly chosen with probabilities based on the current distribution of the top 15 destinations for Filipino migrants. Table 1.3 provides the actual distribution in our resumes of foreign countries where experience was obtained. By design, it matches the locational distribution of current Philippine migrants.

The two remaining resumes from the set of four served as controls and represent non-migrants. To make these resumes as comparable to the foreign resumes as possible, we adjusted work experience to add the same number of years in local work experience and an additional job held if applicable. For example, if a low quality resume was randomly selected to have 6 more years of foreign experience, then we add 6 years of local experience to its corresponding pair. If a high quality resume received 9 more years of foreign work experience, the counterpart resume receives 9 more years of local experience as well. In this way, total jobs held and total years of work experience were always equal between pairs of low quality resumes and pairs of high quality resumes. This ensured balance between control and treatment groups.

1.3.4 Responding to Job Ads and Recording Callbacks

We sent the four resumes in random order in a span of two days to each job ad. We then selected another job ad that was as similar as possible in minimum requirements to the original job ad and resent the four resumes. Thus, each resume was sent to two job ads in total. The idea was to balance statistical power with research cost, due to the labor-intensiveness of creating resumes. I account for this feature later by clustering standard errors at the resume level when performing regression analysis.

We recorded whether applications elicit a callback for an interview. Callbacks come in the form of a call or a text message. We used 32 cell phone numbers. Since leaving voice mail is uncommon practice in the Philippines, we did not use a voicemail-recording service to receive calls, unlike other audit studies. Instead, research assistants answered phone calls from 9-6PM during weekdays. We disregarded phone calls outside this time frame.⁹ For text messages, we considered all of them, regardless of the time of day they were received. All requests for interviews were

⁹We received a total of 301 missed calls throughout the course of the study. It is likely that employers called again when they could not reach us, although we did not track the extent to which this was done.

turned down following a prescribed protocol. We only count a callback if an employer explicitly invites an applicant to an interview.¹⁰

We did not record interview invitations received by e-mail, although this appears rare. In the pilot, we found that whenever employers sent e-mails, they also eventually sent a corresponding invitation for an interview through text message or phone call. As such, we deemed recording e-mails unnecessary.¹¹

We cleaned our data by removing observations from resumes that we later discovered were unsent. At times, there were errors by research assistants; other times, job ads were taken down before we were able to send a full set of resumes. There were also instances when we sent resumes but these had missing information. We dropped observations associated with such resumes. Our final sample thus includes 7474 observations. We pool data from the pilot and full study.

1.4 Summary Statistics

Table 1.4 provides summary statistics of some variables of interest. Panel A describes job ad characteristics in terms of minimum years of required work experience and salary range. Monthly salaries are in Philippine pesos; the average exchange rate in 2014 is around 45 pesos per US dollar. Characteristics vary by firm industry. Administrative and sales positions offer considerably lower salaries than finance and IT; they also require less experience. In Panel B, I present resume characteristics. While all resumes are initially constructed to have minimum required experience, resumes generally have more years of experience than what is required by job ads because years of foreign experience are added (and corresponding years of domestic experience to control resumes).

¹⁰Almost all callbacks request an interview. There were rare instances though when employers called to ask for supplementary material, like for an applicant's photo to be submitted.

¹¹Monitoring callbacks that were received through e-mail was especially difficult because of anti-bot efforts on the part of e-mail providers.

Twenty-four percent (24%) of job applications receive a callback from employers. Of these, employers informed 68% via text message while employers called 47%. The average waiting time for a callback is around 8 days after sending an application, and the waiting time is similar whether this is done through text message or phone call. Many callbacks occur within one or two days; 36% of callbacks occur within two days after sending a resume. The median time to wait for a positive response from employers is four days.

By design, resume features are similar across foreign and local resumes. To demonstrate, in Panel A of Table 1.5, I present sample means of various resume characteristics by treatment status. None of the resume characteristics statistically differ between treatment and local resumes. The same holds true when looking at subsamples by firm category (results not shown). We can be confident that any difference in callback rates between resumes with and without foreign experience is caused by foreign experience.

Similarly, resume characteristics appear balanced across resumes with different years of foreign experience. Panel B of Table 1.5 presents simple regressions of length of foreign work experience on resume characteristics. In all regressions, I employ fixed effects by job ad and quality of resume, consistent with the succeeding analysis (the succeeding section also explains why this might be necessary). Again, characteristics are similar across resumes with different years of foreign experience.

1.5 Results

An initial exploration of the data reveals callback rates to be lower for job applicants with foreign work experience, holding other things constant. Figure 1.2, for example, presents the simple graph of callback rates presented separately for foreign and local resumes with 95% confidence intervals. On average, employers appear to prefer workers who have spent years working domestically to similar workers who

have spent the same amount of time abroad. In addition, callback rates decline as foreign work experience increases. Figure 1.3 presents a plot of callback rates as a function of years spent working abroad. A simple linear regression shows an inverse relationship between both variables; the resulting line is downward sloping. In the following section, I turn to a regression framework to estimate more precise effects.

I estimate the following equation to identify the effect of having foreign work experience on employer callback rates:

$$Callback_{ij} = \alpha + \beta_1 ForeignExp + \beta_2 \mathbf{X}'_{ij} + \delta_j + \varepsilon_{ij} \quad (1.1)$$

Obtaining a callback from the employer of job ad j is indicated by $Callback = 1$ for job applicant i . $ForeignExp$ describes the treatment status of the job applicant and is a dummy variable for having foreign experience. β_1 indicates the effect of having foreign work experience on callbacks and is the coefficient of interest. A vector of controls, \mathbf{X} , includes gender, resume quality, log expected salary, day sent (either the resume was sent in the first or second day), total years of work experience, and total number of jobs held. Since randomization was stratified by job ad, I include job ad fixed effects. I cluster standard errors by job applicant since each applicant's resume was sent to two job ads. A similar equation is used to estimate the effect of length of work experience abroad.

$$Callback_{ij} = \alpha + \beta_1 ForeignLength + \beta_2 \mathbf{X}'_{ij} + \delta_{j,quality} + \varepsilon_{ij} \quad (1.2)$$

In equation 1.2, $ForeignLength$ is an integer value with length of foreign work experience specified in years. The crucial difference from equation 1.1 lies in using job ad and quality of resume fixed effects, $\delta_{j,quality}$. To understand why this could be necessary, note that length of foreign work experience will be positively correlated with total years of work experience for treatment resumes within each job ad. This is so

by construction: when a resume is randomized to have X years of foreign experience, it also obtains X additional years of total work experience (so note for example that total years of work experience cannot be less than length of foreign work experience). Hence, the variables are not completely independent. From a specification using only job ad fixed effects, some of the effect of *ForeignLength* will be identified out of comparing resumes randomized with less years of foreign experience with those with more. But comparing both might confound the effect of total work experience and length of time worked abroad. By using job ad and quality of resume fixed effects, total years of experience are held constant because within the same job ad and quality of resume, the comparison is limited to only control and treatment resume pairs where total years of experience is constructed to be exactly the same.¹²

Overall, employer callback rates respond negatively to foreign work experience. Table 1.6 reports regression results for equations 1.1 and 1.2 with and without control variables.¹³ Controls make little difference to the coefficient of interest (although as expected, they improve precision). Having foreign work experience is associated with a 2.8 percentage point decline in the employer callback rate. This represents an almost 12% decline from a baseline callback rate of 24%. Callback rates are lower for workers who have spent a longer time abroad. For every year of foreign work experience, I estimate that the probability of being called for an interview drops by around 0.5 percentage points. This result does not differ when using an alternate regression where the effect of length of foreign work experience is estimated using only job ad fixed effects and controlling for total years of work experience as a separate variable (as in column 5).

¹²Using job ad and quality of resume fixed effects for equation 1.1 is justified as well but rules out estimating the effects of quality of resume, total years of work experience, and number of jobs held because these covariates drop out of the equation. For transparency, I show results using job ad and quality of resume fixed effects for equation 1.1 in the main table as well. In practice, the use of either set of fixed effects does not matter for the results.

¹³Reporting regression results from specifications with and without controls is consistent with the recommendation of Lin (2013) for experiments, to ensure against specification searching.

The coefficients from other resume characteristics are also of interest. Female applicants receive more callbacks than males, and not because of occupational differences since the regressions control for job ad. While this may strike some as surprising, it is perhaps understandable given the context: the Philippines ranks as the 9th best country for gender equality according to a report by the World Economic Forum (2014).¹⁴ In addition, higher expected wages are associated with fewer callbacks in the experiment. Applications that declare more jobs held in the past receive more callbacks. I return to these results in a later section when discussing potential mechanisms behind the effect of foreign work experience.

The negative effect of foreign work experience is not driven by any particular industry. In Table 1.7, I rerun the main regression separately by job ad industry. Not all point estimates turn out statistically significant, but the effect of foreign work experience is estimated to be uniformly negative across industries. A Wald test cannot reject equality between coefficients. Furthermore, if one takes into account the different mean callback rates per industry and calculates relative effects, the estimated effects become more similar to each other (except perhaps for IT).

The negative effect of foreign work experience also does not differ appreciably when looking only at pairs of high quality resumes or pairs of low quality resumes. Heterogeneous effects by resume quality are presented in Table 1.8. The magnitudes of the effect across column 1 and 2 and across 3 and 4 are the same as confirmed by Wald tests.

Appendix Table A.2 provides some robustness checks on the main finding by checking alternative specifications. Column 1 reproduces the original regression for comparison. In column 2, the regression uses probit instead of OLS. Column 3 runs the analysis on data that drops observations from the pilot study. In column 4, only observations from job applications sent to the first job ad are kept, dropping those

¹⁴In fact, the Philippines is one of the few countries where the unadjusted wages of women are higher than men (International Labour Organization 2014).

associated with the second job ad. The effect of foreign experience is consistently negative across specifications.

One might worry that randomization simply generated strange combinations of country of foreign work experience and job industry in resumes, which accounts for the lower callback rate of resumes with foreign work experience. For example, employers might ignore fictitious resumes of returning migrant workers from Japan whose background is in construction because that is highly uncommon for Filipinos. Hence, it is worth checking if the negative effect persists in job applications where country of foreign experience and job industry are typical. It is widely known for Filipino migrants that the Middle East is a popular destination for construction workers. But confining the analysis to the subgroup of resumes with a background in the Middle East, compared to resumes with only domestic experience, the negative effect of foreign experience in construction job ads remains, as in column 5 of Appendix Table A.2. The negative effect of foreign work experience does not appear to be generated by unusual combinations of resume characteristics.

The results presented here go against the usual understanding that foreign work experience translates into a “brain gain” for origin countries. It contradicts earlier findings that suggest substantial employment gains from return migration. But why might firms dislike workers with foreign experience?

In the next section, I consider possible mechanisms. First, firms may think that migrants negatively select into migration or that return migrants are negatively selected from the pool of existing migrants. Second, firms may think expected wages of return migrants are high and thus be disinclined to interview them. Third, firms may actually value return migrants but believe they are overqualified. Fourth, firms may expect low expected tenure from return migrants who are inclined to take other jobs abroad. Finally, firms may value local knowledge over overseas experience; location-specific human capital is important. I find evidence supporting the latter mechanism,

and attempt to provide evidence against the other channels.

1.6 Mechanisms

1.6.1 Negative Signaling

One possible reason for why return migrants may obtain a lower callback rate is that employers may *perceive* negative selection of return migrants. The emphasis on perceptions is key here because while fictitious resumes cannot self-select and randomization ensures that foreign experience (and not another factor) produces the lower callback rate, the effect of foreign experience may still arise out of perceptions of return migrants as being negatively selected from the employers' perspective. I refer to this mechanism as “negative signaling” to distinguish it from “negative selection.”

Negative signaling may arise in two ways from the experiment: Employers may perceive migrant departure by itself to convey a bad signal or employers may interpret migrant return as a negative signal because of the migrant's failure to stay abroad. The following subsections provide evidence against both of these potential explanations of the main result.

1.6.1.1 Migrant Departure as a Negative Signal

We sent cover letters together with randomly chosen job applications to test whether resumes might transmit a positive or negative signal to employers. Twenty percent (20%) of control resumes were sent with a letter indicating that the applicant had recently received a job offer from abroad but had to withdraw due to some plausibly exogenous reason. The letters explained that the working visa suddenly could not be processed or that an unexpected sickness of a family member made it difficult to move. The idea was to test whether selection into migration by itself conveyed a negative signal to employers, since applicants with the cover letter select

into migration but had yet to accumulate foreign experience. Correspondingly, 20% of foreign resumes were sent with an attached letter saying that the applicant had returned home because of a plausibly exogenous event: unforeseen complications with signing an extension for a work contract abroad suddenly arose or an illness in the family suddenly had to be attended to. Although such reasons could have still been taken by employers to signal applicant quality, the idea was to eliminate with the letter, to the extent possible, the negative signal associated with return by providing a reason unrelated to personal failure. No cover letters were sent with the rest of the applications.

Employers appear to perceive migrant departure as a positive signal rather than as a negative signal. Table 1.9 presents regressions estimating the effect of cover letters on callback rates, holding constant the usual set of control variables. Consider first only control resumes, applicants with purely domestic work experience. If migrant departure by itself conveys a negative signal, then resumes that indicated an almost completed attempt to work abroad should have had a lower callback rate. But in column 1, such resumes received a 3.9 percentage point higher callback rate than resumes that had not indicated an attempt to move abroad. The positive coefficient is consistent with employers believing in positive selection among Filipinos into migration.

This result is remarkably in accordance with what is found by existing studies on the nature of selection of Filipinos into migration. When looking at survey data of actual Filipinos, studies find that Filipino migrants possess observed traits that indicate higher productivity than their counterparts. They tend to be younger and better educated (Ducanes and Abella 2008). More importantly, they also appear to be positively selected on unobserved traits that indicate higher productivity. For example, Clemens, Montenegro and Pritchett (2008) estimate where in the distribution of home country wages Filipino migrants' wages (before they move) come from. They com-

pare wage residuals arising from Mincer-type regressions of Filipino migrants versus non-migrants. They estimate that the mean residual of movers lie at the 54th percentile of the distribution of residuals of non-migrants, suggesting (modest) positive selection. Figure 1.4 reproduces the kernel density plot from that paper indicating this. The employers' belief in this study squares with the fact that Filipino migrants are positively selected in real world data.

1.6.1.2 Migrant Return as a Negative Signal

A separate but related issue concerns whether employers believe the act of returning by itself conveys a negative signal, that return migrants are negatively selected from the pool of Filipino workers abroad. Borjas and Bratsberg (1996) model how, for example, if migrants base their initial migration decision on overly optimistic expectations about employment abroad, it is the less skilled who return home. The less skilled are most vulnerable to worse-than-expected employment outcomes at the destination so it will be this group who chooses to return. Thus, the lower callback rate to resumes with foreign experience may arise from the negative signal conveyed by this type of return. Employers may value experience overseas but are concerned that those who return are less desirable workers, along dimensions not completely captured by the objective qualifications stated in the resume. Even with the positive signal associated with migrant departure, this negative signal of return may be large enough to translate into a net negative effect on callback rates.

Employers however do not appear to perceive migrant return as a negative signal. In column 2 of Table 1.9, I focus exclusively on resumes with foreign experience. Again, cover letters were randomly assigned to these foreign resumes and attempt to explain return home as an event that is outside the influence of the migrant (i.e. not due to a personal failure). If return migration signaled that return migrants were negatively selected, then those without a cover letter should have had a lower callback

rate because in principle the cover letter should minimize the negative signal. But the cover letters appear to have had a negligible effect; in fact, there appears to be no difference between those who declared they had to return home for an exogenous reason and those who did not.¹⁵

Perhaps an even more important reason to doubt negative signaling from return has to do with declining rates of callback, as resumes increase in indicated length of foreign experience. The underlying economics suggests that negative signaling should be all about the effect at the extensive margin, not the intensive margin, of foreign work experience. Furthermore, the Borjas and Bratsburg model implies that the negative effect of foreign experience must manifest most in applicants who had spent the least amount of time abroad. Since low ability workers are more likely to realize failure earlier on in their tenure abroad, there is less reason to suspect failure among workers who have been able to stay a long time. Hence, the negative signal, if anything, should be most prominent (and callback rates lowest) for workers with the briefest spells abroad.

The data reject this type of reasoning. Table 1.10, for example, presents regression results including both the dummy variable of having foreign work experience and years spent working abroad in the same equation. The results indicate that the decline in callback rates is not explained by having returned from abroad (the extensive margin) as much as it is by time spent abroad (the intensive margin). In Figure 1.5, I plot fully flexible coefficient estimates that detail the effect of each separate year of foreign experience on callback rates, with the omitted category being the group of resumes with no foreign experience. I use a full set of controls to generate the figure and

¹⁵A caveat to the cover letter results is that they may indicate nothing about the content of cover letters and simply capture the effect of having sent one. Ideally, all resumes should have been sent with a cover letter, with some containing a generic message that provides little information. The generic cover letters would have served as the ideal comparison group to the cover letters that included an explanation. Nevertheless, that the effects are asymmetric between cover letters in the control and foreign resumes is reassuring. Unless there is a compelling reason why cover letters should have had differential effects between the two groups, the contents would be driving the results and not the cover letters by themselves.

indicate estimated confidence intervals at the 95% level.¹⁶ The coefficient estimates are all negative, except for an outlier at 7 years. More importantly, the coefficients become more negative as years of foreign work experience increases. It is difficult to attribute this pattern to negative signaling arising from return.

1.6.2 High Expected Wages

Return migrants might obtain a low callback rate simply because employers believe these workers demand higher wages than other applicants. Hence, while foreign experience may be valuable, an employer might expect to pay a higher price or incur extra bargaining costs. As a result, the additional cost may turn out to be larger than the benefit of hiring someone with experience abroad, which is why foreign resumes have lower callback rates.

The hypothesized mechanism relies on expected wages being unobserved, but in this experiment, wages are made explicit. As previously discussed, the two job websites we used allow applicants to indicate expected salary. Most companies declare a range for a reasonable monthly salary to expect in offered positions. For each job ad, we randomly assigned expected salary to be sent together with each resume and application. Expected salary was constrained to be divisible by a thousand pesos and in the range of what the company declares. If a company does not state a salary range, research assistants provided an estimate of the appropriate range. As a result, provided that employers believed the declared expected salaries, their perceptions about the cost of hiring applicants with foreign experience should have been the same for applicants without foreign experience. That foreign experience continues to exhibit a negative effect on callback rates in Table 1.6, even when salary is declared, provides evidence against high expected wages as an explanation. Higher expected wages lead to fewer callbacks which suggests that employers interpret expected wage

¹⁶Appendix Table A.3 provides the corresponding regression table.

as some signal of a worker's reservation wage.

This is not to suggest though that employers do not interpret declared expected wage as some signal of a worker's marginal product. One concern in fact is that this interpretation might artificially create the negative effect of foreign work experience in the experiment. Suppose employers normally expect return migrants to have excessively high expected wages compared to non-migrants. My interviews with employers to be discussed in a later section indicate that this might be the case. Then, by declaring expected wages to be equal to non-migrants in this study, return migrants might be giving off a negative signal about their productivity. This can translate into the lower callback rates that return migrants receive in the experiment.

Fortunately, this alternate story can be tested in the data. Because declaring a lower-than-average expected wage might give employers a negative signal, this implies that the negative effect of foreign work experience for return migrants should be less at the higher end of declared expected wages. But this does not seem to be the case. Figure 1.6 provides the relationship between expected wages and callback rates for the group of resumes with foreign experience and the group without. To normalize between job ads, the horizontal axis denotes the ratio of resume expected salary to the median of the salary range indicated by the respective job ads. In general, higher expected salary ratios lead to lower callback rates. But the smoothed graph for resumes with foreign experience appears to be a simple downward shift of the graph of resumes with no foreign experience. Indeed, a formal test cannot reject the null hypothesis that the effect of foreign work experience is invariant at different levels of declared expected wage (results not shown, but available upon request). Higher expected wages do not appear to reduce the negative effect of foreign work experience.

None of this is to suggest that employers do not think migrants in general have high expectations over something other than wages that makes them less attractive, such as high expectations over job benefits (e.g. vacation time, daily working hours)

or perks or in being treated in a “Western way.” This is harder to rule out. In fact, interviews with employers discussed in a later section, hint that this may be the case. Assuming however that expected salary is a good proxy for expectations about other job amenities, this hypothesis suggests that the interaction between higher expected wages and foreign experience should increase the penalty from having foreign experience. As already shown, however, this is also not the case. Higher expected wages do not appear to magnify the negative effect of foreign work experience.

1.6.3 Overqualification

Overqualification occurs if a job applicant is more suitable for a considerably better job than what is applied for. A job applicant is overqualified if he has educational attainment, or skills, that surpass what is required to achieve sufficient performance.

Employers may prefer applicants who just fulfill minimum job qualifications. Bewley (1998) for instance notes that firms might avoid hiring overqualified applicants for fear that they might quit as soon as they find a more suitable job or become a threat to their managers. If experience working abroad is viewed as surplus human capital, then this could account for the lower callback rates.

Overqualification does not appear to be a compelling explanation for the negative effect of foreign work experience. If it were, then applicants with resumes constructed to have high quality should have had less appeal to employers than those who barely fulfilled minimum required skills and background for the job, namely, the low quality applicants. High quality resumes described applicants from elite educational backgrounds, who possessed additional skills, and had 2 more years of work experience. But these resumes have higher callback rates than low quality applicants as shown in Table 1.6.

1.6.4 Low Expected Tenure

Perhaps employers believe return migrants are flight risks, expected to have low tenure on the job, as return migrants might prefer working abroad and thus be likely to depart again as soon as a better opportunity abroad opens up. Frequent turnover hurts employers as they incur high recruitment and training costs to find replacements. Various surveys often find high turnover as a main concern of employers. In the Philippines, a recent survey of some 300 executives conducted by a large job website found that 58% of respondents agreed that “job-hopping makes resumes look bad”.¹⁷

Holding total years of experience constant, total number of jobs held in a resume provides an indication of an applicant’s flight risk. If employers disfavor migrants primarily because they expect them to have low tenures, then having worked in many jobs for a short period of time must also provide a bad signal to employers.

Revisiting Table 1.6, I fail to find a negative effect on callback rates of having worked in many jobs, holding total years of experience constant. In fact, the point estimate for total jobs held is positive.

1.6.5 Location-Specific Human Capital

Finally, I examine location-specific human capital as a potential mechanism. Becker (1962) initially proposed that investments in human capital might be country-specific, and skills might not easily transfer across geographic locations. The existing causal evidence for the theory is limited but Bazzi et al. (2014) find that this could be true: using a large-scale relocation program in Indonesia as a natural experiment, the authors show that migrant farmers become less productive when they move to locations with agroclimatic environments dissimilar to their place of origin. Similarly, the reluctance to hire return migrants in this study might occur because foreign work

¹⁷See Jobstreet (2011) <<http://www.jobstreet.com.ph/aboutus/preleases119.htm>, accessed April 18, 2015.>

experience does not easily transfer to the domestic setting.

Employers may value domestic over foreign experience because the local context requires knowledge of location-specific production methods. By spending time away from home, migrants lose this knowledge of the local economy and their human capital depreciates. As a result, one prediction is that callback rates may fall as years of foreign experience increases. This is consistent with the finding in this experiment.

To further test the theory of location-specific human capital, we conducted a sub-experiment. Keeping all procedures the same, we sent 2000 additional resumes to job ads, except we altered the timing of foreign experience for treatment resumes. Instead of having foreign work experience in the last job held, we indicated it as experience in the first job held in work histories. Therefore, return migrant job applicants declared some recent local job experience after they had returned from abroad. Since everything else was kept the same from the original protocol, the alteration should result in a reduction of the negative effect of foreign experience if location-specific human capital is a prevailing explanation. Return migrants would have had foreign experience but they would also have had time to recover their domestic human capital.

I run all the same regressions using data from the sub-experiment and show the results in Table 1.11, comparing the outcome to the original results. I focus mainly on the coefficients for foreign experience. Panel A looks at the full samples while Panel B focuses on specific firm industries.

In contrast with the main experiment, I mostly do not reject the null hypothesis that the effect of foreign work experience is zero in the sub-experiment. Some point estimates turn out to be negative, but as suggested by the hypothesis, most appear smaller in magnitude relative to the main experiment. Indeed, the timing of foreign work experience, whether earlier or more recently, appears to matter. In terms of the preferred specification, the effect of having foreign experience in the side experiment is around $2/3$ as large as the effect in the main experiment. In general, however, I

cannot conclude that the differential effect between the main and sub experiments is statistically significant from zero, although the difference is significant for results in the construction sector and administrative positions for length of foreign experience.

In sum, the results are suggestive that location-specific human capital is a potentially important explanation for the negative effect found for foreign experience, and that the negative effect may in fact be short-lived. In this section, I presented evidence against other mechanisms, yet cannot rule out this particular channel. Moreover, the fall in callback rates as years of foreign work experience increase corroborates the theory that home country human capital depreciates abroad, at least from the perspective of employers.

1.7 Discussions with Employers

As a supplement to the study, I conducted interviews with employers a year after the experiment. The objective was to let employers offer their own explanations for my findings and to see whether these turned out consistent with theories presented here. Respondents were recruiters from the Human Resources department of companies which, though not necessarily part of the original study, were in the same industries, and had online job ads currently posted. I contacted Human Resources personnel whose email addresses were publicly available through company websites or LinkedIn. Out of the 283 I attempted to reach, 34 responded. Conversations usually took place through email exchange, though some transpired through phone call and web chat as well.

The interviews were carefully structured to avoid influencing recruiters' responses with prior information. First, recruiters were simply asked:

Do you believe employers in your industry are more willing to hire returning overseas Filipino workers over workers whose experience is in working with domestic employers? Why or why not?

After they respond, I reveal the basics of the experiment: the design of sending fictitious resumes, and the result that resumes with foreign work experience get 12% fewer callbacks compared to other resumes, with the callback rate declining the longer an applicant has spent abroad. No other information is offered. I ask whether they could make sense of this finding but refrain from offering any explanations and prod only to ask for clarification on their responses or to ask for more specific examples.

Two types of responses stand out. The initial response of a substantial majority is to mention pay scale as a concern. Most respondents indicate that relevance of work experience to a position is the most important factor in hiring decisions, not where experience was attained, but that they feared returning workers expect higher salary offers than what the company's budget can accommodate. From experience, they said returning workers do not normally agree on the hiring salary rate, as it is often lower than what they were receiving abroad. Some respondents even mentioned why an applicant with foreign exposure may in fact be desired because of the unique skills they bring and especially when the job entails interacting closely with partners from a foreign country. But the conversation usually goes back to why the demand for a higher salary by such workers is a deal breaker. In which case, employers said that they would just go for the applicant with a domestic background.

This response on high expected wages is interesting as it might suggest that callback rates to returning migrants would have even been lower in the experiment had expected salary not been declared; employers would have had even more reason to suspect high expectations from those with foreign work experience. However, this concern about high expected wages persists even after I describe the experiment to respondents, and that declared expected salaries were held constant between job applications. On one hand, this reflects how respondents may simply have misunderstood the explanation for the experiment. On the other hand, they could be implying that declaring expected salaries does not completely shut off this mechanism; they

anticipate returning migrants to have high expectations in other dimensions not captured by declared expected wage, such as vacation days or wage growth. While again this cannot be confirmed by the preceding analysis, it remains a possible mechanism.

It is when I reveal the details of the experiment that a second type of response emerges, hinting at the depreciation of local human capital as a plausible explanation. A recruiter describes what is perhaps the simplest example for how this can occur. The recruiter was referring to an instance when she was trying to hire a Project Manager to oversee several projects around Metro Manila. The following was translated from the local dialect:

Because sometimes, especially if they are assigned to a particular place, what OFWs tell us is that they've been away from the country for a long time and so they are no longer familiar with how to go, how to arrive at a place, that destination. They no longer know how to go around places.

Another typical response refers to “culture mismatch” or the difficulty returning migrants have in embracing local company culture after they become used to work norms abroad. One can view this mismatch as having poor country-specific human capital. Here is one reply, for example:

OFW adapts to their superior's working style and copes up in working with diverse national and culture. When time comes they apply here in PH- they now carry the culture of his previous employer- HR and Hiring Manager may see it during the screening and interviews... [sic]

One example for this one is our applicant for the Finance Manager Position- she works in hospitality industries in Micro- Polynesia region, has almost 10 years experience in the said field, locally and overseas. We didn't pass her during our screening because 1. Her compensation and benefits expectation is too high (she is used to receive net of tax rate and having worked in hospitality – has a monthly service charge) 2. Her average tenure in local companies are not longer than one year – there is that culture mismatch. [sic]

Some also cite an aversion to the different way returning migrants might conduct themselves, which could strain company culture:

There's a certain stigma with staff positions. Filipino culture, especially prevalent in local companies, could have this. [We do not like someone with] "outsider" experience already... [sic]

Culture in a sense that we tend to stick to "our" ways of doing things. For example, as simple as lunch. If you look at Filipino Local companies, they would take lunch at 11am sleep at 12-1, even the government does this. I'm not generalizing, but I've interviewed people also who had experience in Singapore to be part of my team in HR. But at the back of my mind, hiring him would dilute my team environment. Too much of a threat for the rest. [sic]

While these quotes, of course, cannot be taken as definitive (the response rate for the survey is low, these are the opinions of a select group, etc.) they are indicative of the value placed on local knowledge and culture, and the view that some sort of human capital is lost as a person is away abroad. Other explanations that came out of the interviews, but do not find support in the empirical analysis, include the tendency of returning migrants to have short tenures and to work abroad again, or overqualification. But these were less commonly mentioned.¹⁸

1.8 Conclusion

The governments of migrant-sending countries, together with international organizations, typically implement programs that actively recruit migrants to return home with the belief that these migrants increase productivity and eventually generate spillovers in domestic economies. Programs usually target the high-skilled and include generous financial incentives. Thus, as described by Lowell (2001) from 1974 to 1990, the Return of Qualified African Nationals program, run by the International Organization for Migration, helped place 2,000 return migrants from 41 African countries into positions back in their home countries. The program offered free return tickets for the migrant's family, helped ship personal effects, and covered settling expenses

¹⁸Appendix Table A.4 presents a tabulation of recruiter responses.

plus professional equipment. In India, the Ministry of Science and Technology sets up fellowships that cover up to 500,000 rupees yearly for returning scientists, shouldering salary, travel expenditures, conference visits, etc. (Jonkers 2008). In Malaysia, the Returning Expert Program offers a low flat tax rate of 15 percent on employment income for 5 years and the ability to import two cars tax-free. Similar programs are found in the Philippines, Thailand, China, Argentina, Mexico and others.

To date, however, doubts remain as to the efficacy of such programs. Return migration programs are seldom evaluated for their impact,¹⁹ and take-up rates remain small. McKenzie and Yang (2015) worry that in many cases generous incentives might just subsidize the return of individuals who are likely to return anyway. Financial incentives might feed resentment or even potentially encourage individuals to move abroad in order to take advantage of benefits when they return. Then there is the question of who exactly benefits from return to the origin country, even when programs are successful in luring back migrants.

This paper demonstrates that in the case of employers, they may not particularly favor return migrants when similar workers with the same set of skills and educational background are available. I sent fictitious resumes and observed the behavior of employers as measured in callback rates. By sending otherwise identical resumes and experimentally varying how long applicants worked abroad, I estimated the effect of foreign work experience on a sample of fictitious job applicants. I found that return migrants obtain lower callback rates than other job applicants, other things equal. The results hold for both high- and low-skilled migrants and for jobs in the different industries. At least in countries without severe skill shortages, this makes it harder for programs subsidizing return to justify themselves from a cost-benefit standpoint.

¹⁹One exception is a recent study by Del Carpio et al. (2015) evaluating the efficacy of Malaysia's Returning Expert Program; they estimate a positive effect of the program on the probability applicants return to Malaysia, but only find this effect to be statistically significant for a select group of applicants: those who already have an employment offer in the source country and for women without a Malaysian spouse.

Pinpointing exactly why employers behave this way requires further research, although I examined several potential explanations. I provided evidence against negative signaling, high expectations for wages, overqualification, and high job turnover rates as primary channels. There is some suggestive evidence that the deterioration of location-specific human capital is responsible for the declining callback rates as migrants spend a longer time abroad.

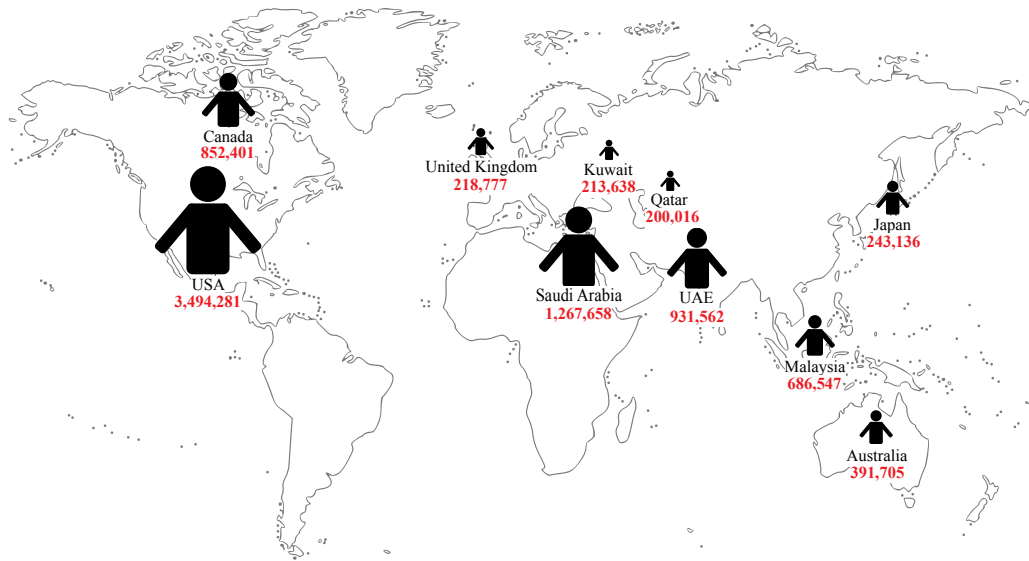
Caution, however, must be exercised in interpreting the findings to ultimately mean that return migration has little value. This study looked at select jobs from the two largest job websites in the Philippines. Employers have alternative means with which to recruit workers; employers may behave differently in alternate settings. In addition, this paper only considered the foreign work experience of returning migrants. There are other channels through which return migrants could bring value to their home countries. This research does not touch upon human capital externalities in education of the kind studied by Moretti (2004). Especially if returnees gain education from elite institutions abroad, this may generate positive spillovers when they return, beyond their participation in the labor force. Returnees could bring home monetary savings, an experience of well-functioning political institutions abroad, and raised expectations for their home country (Clemens 2009). In fact, recent estimates from the World Bank hint at the presence of vast amounts of diaspora savings²⁰ suggesting that migrants might catalyze entrepreneurial activity when they return.²¹ Yang (2006) shows that investment increases, at least for some migrant households, upon return. Moreover, research reveals that migrants could spur the improvement of political institutions at home (see for example Spilimbergo (2009), Saxonian (2006), and Iskander (2010)). These topics are outside the scope of this work.

²⁰<<http://blogs.worldbank.org/peoplemove/files/NoteonDiasporaSavingsSep232014Final.pdf>, accessed Jan. 5, 2015>

²¹Note though that this appears contradicted by a government report, at least in the Philippines, that shows 70 to 80 percent of overseas Filipino workers do not have significant savings upon return (Newland, Agunias and Terrazas 2008).

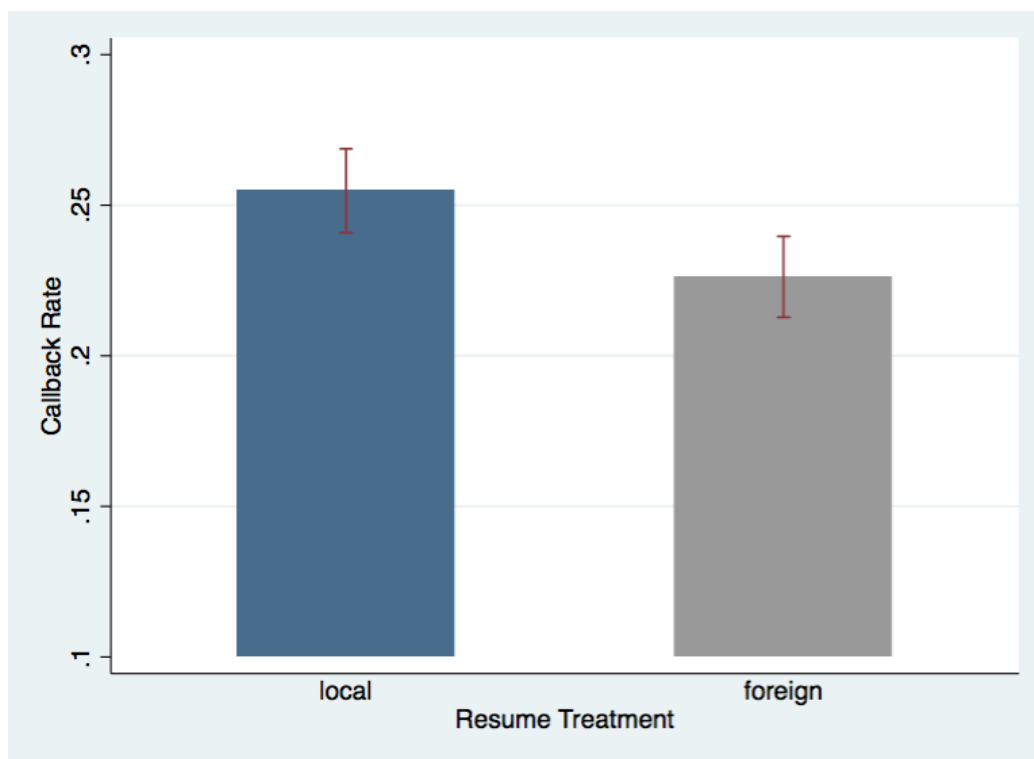
Nevertheless, this paper brings to light a much less recognized aspect of return: that return migrants may not fare as well in the domestic labor market as commonly assumed. This suggests reorienting return migration programs to possibly include provisions for the reintegration of returning workers into the local economy. For even without active encouragement, many international migrants have no choice but to return to their origin country since most working contracts stipulate that they do. In OECD countries, this form of temporary labor migration is prevalent (OECD 2014). For countries in the Gulf Cooperation Council (GCC), another major migration corridor for low-skill workers, there is virtually no path to permanent residence even after years of stay. It is important to understand the implications of return for these migrants if home country governments are to assist them.

Figure 1.1: A Global Mapping of the Estimated Stock of Overseas Filipinos (Top 10 Destination Countries)



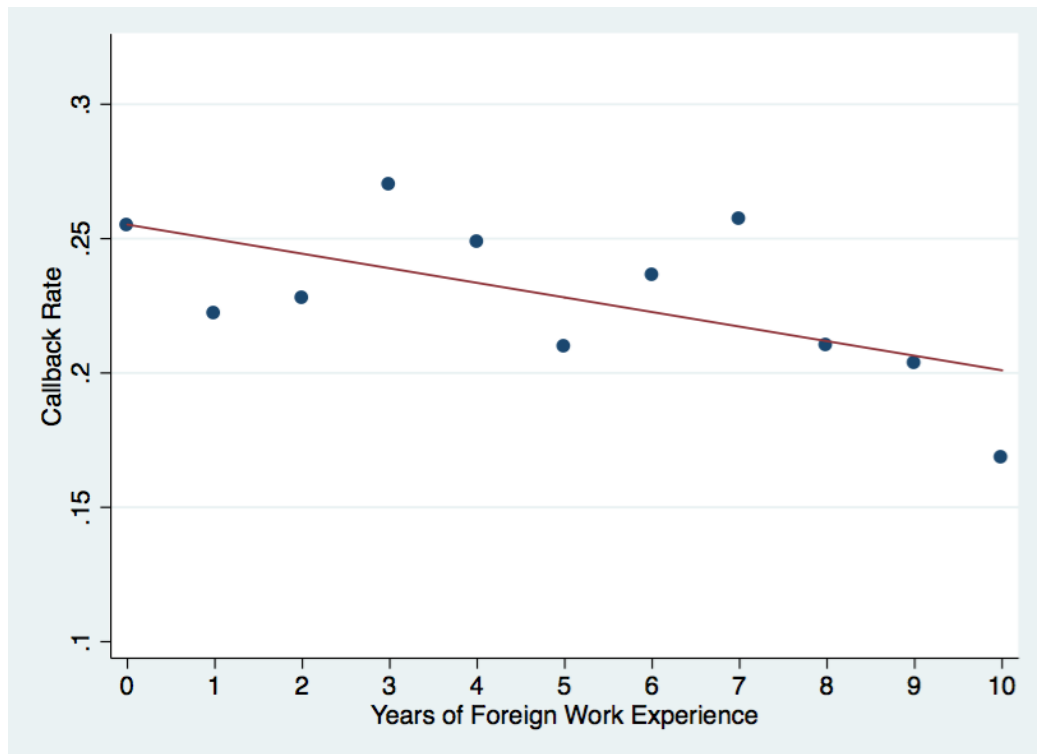
Source: Data are from the Commission on Filipinos Overseas, 2012 Stock Estimates

Figure 1.2: Callback Rate By Resume Treatment Status



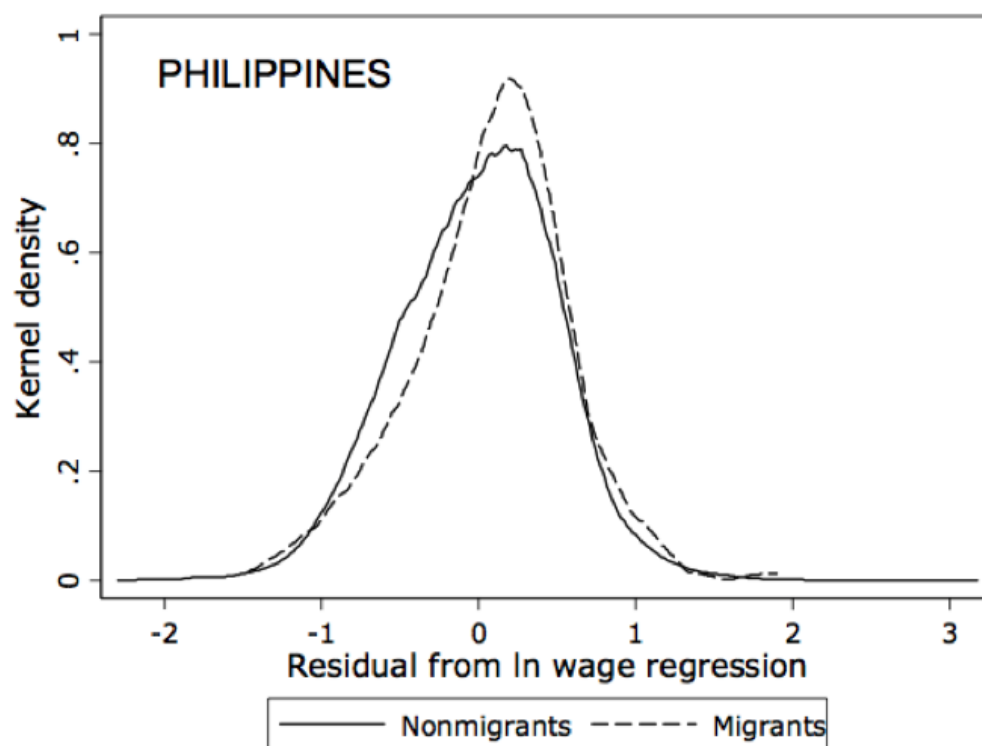
Notes: The figure is generated by computing the mean callback rate for resumes without foreign work experience (local, n=3752) and with foreign work experience (foreign, n=3722). 95% confidence intervals are indicated in brackets.

Figure 1.3: Callback Rate vs. Length of Foreign Experience



Notes: The figure is generated by computing the mean callback rate for resumes associated with each year of foreign work experience. The resulting line provides the result of a simple regression of callback rates on years of foreign work experience.

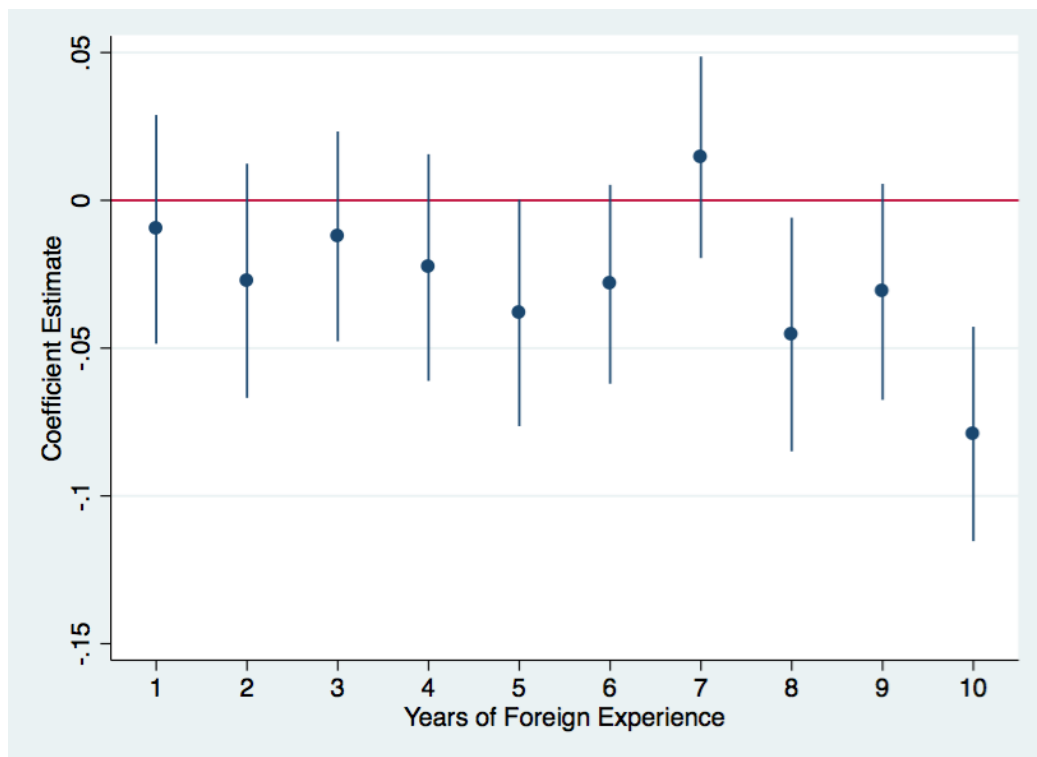
Figure 1.4: Kernel Density Plot of the Wage Residuals of Migrant vs. Non-migrant Households



Source: The density plot is taken from Figure 3 in Clemens, Montenegro, and Pritchett (2008)

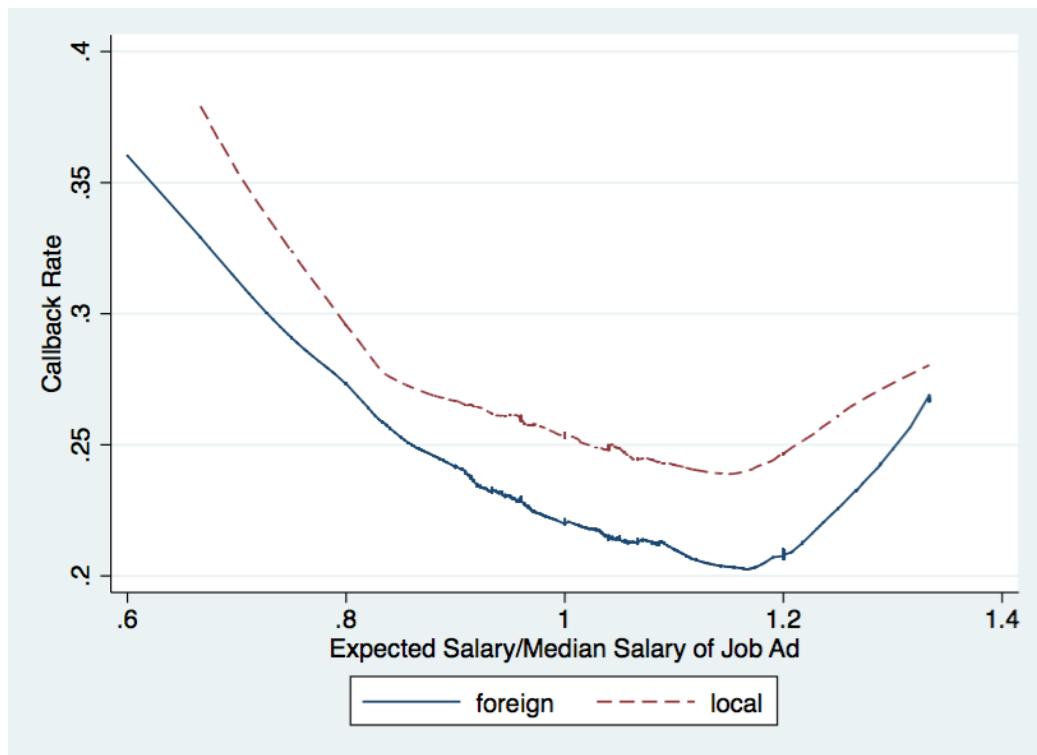
Notes: The kernel density plot compares the distribution of residual wages earned by non-migrants to those earned by subsequent migrants using survey data from the Philippines. Migrants lie at the 54th percentile of the distribution of the unobserved earnings of non-migrants.

Figure 1.5: Coefficient Estimates By Years of Foreign Experience



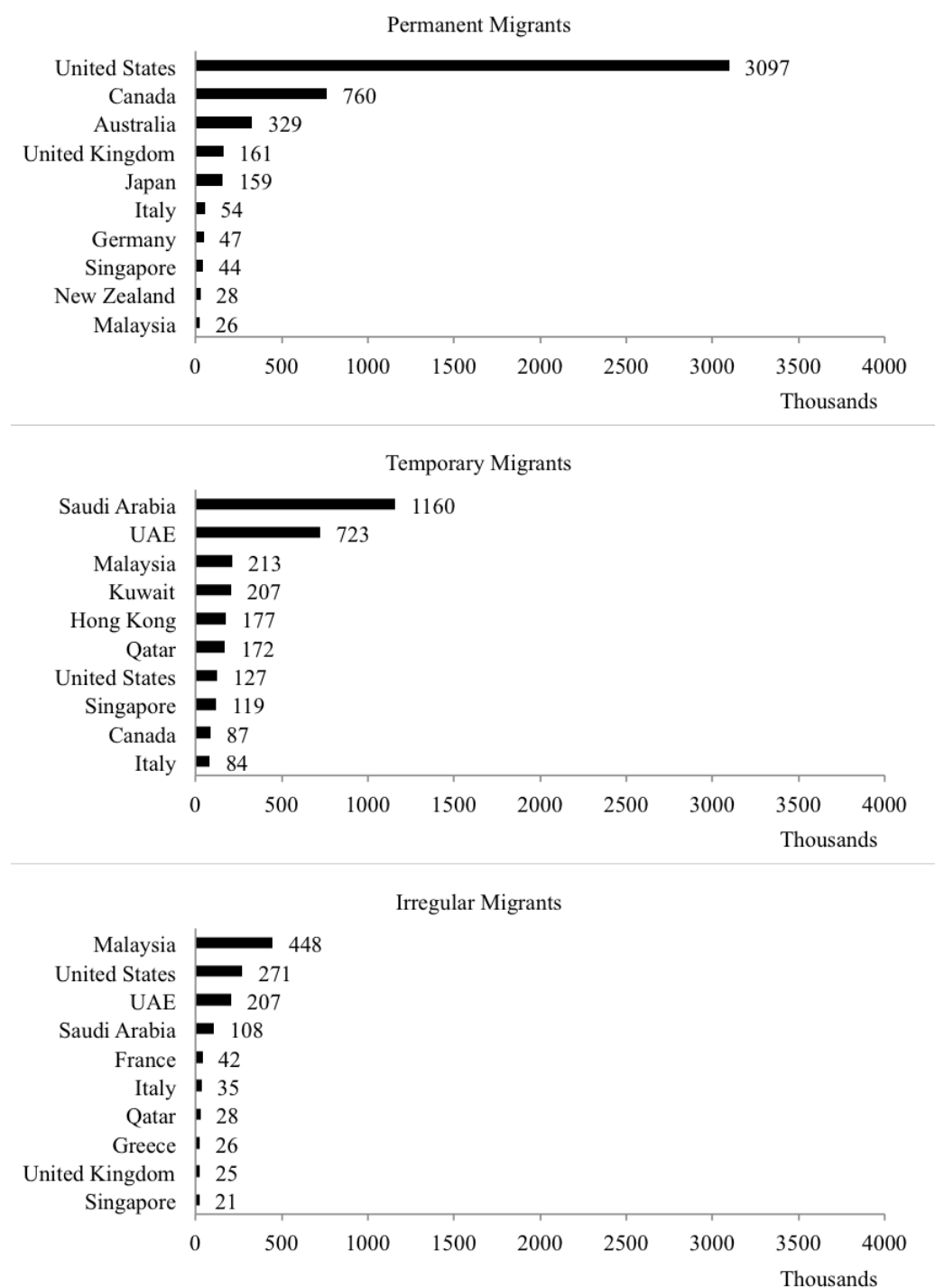
Notes: The figure plots fully flexible coefficient estimates of a regression of callback on a set of dummies for years of foreign experience. The regression uses a full set of control variables. 95% confidence intervals are indicated in brackets.

Figure 1.6: Fewer Callbacks for Resumes with Foreign Experience at all Expected Wage Levels



Notes: The figure is estimated using locally weighted regressions of callback on expected wage ratio (the declared expected wage in a resume divided by the median salary declared by resumes submitted to the same job ad). The regressions use a running line least squares smoother with bandwidth of 0.8. The regressions are shown for both the sample of foreign and local resumes.

Table 1.1: Top 10 Countries of Destination of Permanent, Temporary, and Irregular Migrants in 2012



Source: Data are from the Commission on Filipinos Overseas, 2012 Stock Estimates

Notes: The figure provides stock estimates of the number of Filipino migrants distributed among the top 10 destinations broken down by type of migration. Permanent migrants are those with visas that allow indefinite stay in the destination country. Temporary migrants are workers whose stay abroad is regulated by contracts with specified lengths. Irregular migrants refer to those abroad without valid residence or work permits.

Table 1.2: Distribution of Overseas Filipino Workers (in percent)

Major Occupation Group	Total	Male	Female
Managers	3.5	5.2	1.9
Professionals	11.6	10.1	13.1
Technicians and associate professionals	7.6	11.1	4.1
Clerks	5.2	3.1	7.3
Service workers, shop, and market sales workers	16.7	13.6	19.8
Farmers, forestry workers and fishermen			
Trades and related workers	12.9	25.1	0.6
Plant and machine operators and assemblers	11.7	21.5	1.7
Laborers and unskilled workers	30.8	10.4	51.4
Total	100	100	100
Number of Workers in Thousands	2,295	1,154	1,141

Notes: The estimates cover overseas Filipinos whose departure occurred within the last five years and who are working or had worked abroad during the past six months of the survey period.

Sources: Data are taken from the 2013 Survey of Overseas Filipinos.

Table 1.3: Countries of Foreign Experience of Resumes in the Audit Study

Country	Frequency	Percent (%)
USA	1413	38.0
Saudi Arabia	521	14.0
UAE	378	10.2
Malaysia	332	8.9
Canada	318	8.6
Australia	131	3.5
UK	114	3.1
Kuwait	99	2.7
Qatar	78	2.1
Japan	76	2.0
Singapore	66	1.8
Hong Kong	62	1.7
Italy	49	1.3
South Korea	42	1.1
Taiwan	40	1.1

Notes: The table presents the distribution of countries where foreign experience was obtained among resumes in the experiment.

Table 1.4: Summary Statistics

Panel A: Job Ad Characteristics

All Jobs	Mean	SD	Min	Max
Required Minimum Years of Experience	2.75	2.06	0	15
Min of Salary Range Offered	24,791	3,720	3,000	150,000
Max of Salary Range Offered	35,624	19,871	11,000	300,000

By Firm Industry	Common Job Titles	Median Min Salary (monthly Php)	Median Max Salary (monthly Php)	Median Min Required Experience (Yrs)
Administrative	Administrative Assistant Executive Assistant HR Assistant	15,000	22,000	2
Construction	Civil Engineer Project Engineer Quality Surveyor	20,000	30,000	2
Finance	Accountant Accounting Manager	30,000	40,000	3
Sales	Finance Manager Sales Engineer Sales Executive	15,000	25,000	1
IT	Sales Representative Web Developer Java Developer Programmer	30,000	40,000	3

Panel B: Resume Characteristics

All Resumes	Mean	SD	Min	Max
Total Years of Experience	9.43	3.64	1	24
Total # of Jobs Held	2.88	0.99	1	7
Expected Salary	29,952.10	15,456.15	2,000	190,000

Panel C: Callback Rates

By Firm Industry	Callback Rate
All	24%
Administrative	13%
Construction	30%
Finance	25%
IT	30%
Sales	22%

Manner of Callback	Percent	Frequency
Text message only	53%	952
Mobile callback only	32%	577
Both	15%	269
Total		1798

Days Elapsed Before First Callback	Mean	Median	Min	Max
Text message	8.4	4	0	89
Mobile	8.3	4	0	89

Table 1.5: Randomization Tests

Panel A: Balance Between Foreign and Local Resumes			
	Sample Means		p-value of difference in means
	Local	Foreign	
Quality (High=1, Low=0)	0.498	0.502	0.819
Gender (Female=1, Male=0)	0.493	0.514	0.189
Ln(Expected Salary)	10.203	10.202	0.930
Order Sent	0.497	0.507	0.627
Total Years of Experience	9.430	9.440	0.933
Total # of Jobs Held	2.880	2.887	0.989
Observations	3,752	3,722	7,474
Panel B: Balance in Resumes with Different Years of Foreign Experience			
	Dependent Variable = Length of Foreign Work Experience		
Gender (Female=1, Male=0)	0.2006 (0.1586)		
Ln(Expected Salary)		-0.0931 (0.5284)	
Order Sent			0.1675 (0.1226)
Observations	7,474	7,474	7,474

Notes: Panel A reports means of resume characteristics by treatment status (local or foreign) and presents p-values of t-tests of the difference in sample means, accounting for stratification at the job ad level. Panel B presents balance tests among resumes with different years of foreign work experience. Each column is a regression of length of foreign work experience on a resume characteristic, using job ad and quality of resume fixed effects. Panel B presents no regressions with total years of experience and total # of jobs held because by construction, resume pairs within the same job ad and quality of resume have exactly the same total years of experience and total # of jobs held. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 1.6: The Effect of Foreign Experience on Callback Rates

	(1) Callback	(2) Callback	(3) Callback	(4) Callback	(5) Callback	(6) Callback
Has Foreign Experience=1	-0.0286*** (0.0101)	-0.0280*** (0.0071)	-0.0269*** (0.0067)	-0.0054*** (0.0014)	-0.0049*** (0.0011)	-0.0048*** (0.0011)
Length of foreign experience						
Quality (High=1, Low=0)		0.0378*** (0.0081)			0.0332*** (0.0082)	
Gender (Female=1, Male=0)		0.0395*** (0.0095)	0.0389*** (0.0111)		0.0397*** (0.0095)	0.0391*** (0.0112)
Ln(Expected Salary)		-0.0588* (0.0346)	-0.0347 (0.0398)		-0.0578* (0.0345)	-0.0331 (0.0396)
Order Sent		-0.0007 (0.0071)	0.0081 (0.0087)		-0.0004 (0.0071)	0.0085 (0.0087)
Total Years of Experience		0.0001 (0.0019)			0.0025 (0.0020)	
Total # of Jobs Held		0.0151* (0.0079)			0.0146* (0.0079)	
Mean Callback	0.24	0.24	0.24	0.24	0.24	0.24
Fixed Effects for Job ad	N	Y	N	N	Y	N
Fixed Effect for Job ad*Quality	N	N	Y	N	N	Y
Observations	7,474	7,474	7,474	7,474	7,474	7,474
R-squared	0.001	0.639	0.787	0.002	0.639	0.787

Notes: The table presents regression results of callback on foreign work experience. Robust standard errors, clustered at the resume level, are in parentheses. Regressions include a constant term. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 1.7: The Effect of Having Foreign Experience on Callback Rates By Firm Industry

	(1)	(2)	(3)	(4)	(5)
	Callback (Admin)	Callback (Construction)	Callback (Finance)	Callback (Sales)	Callback (IT)
Has Foreign Experience=1	-0.0120 (0.0128)	-0.0453*** (0.0164)	-0.0306* (0.0178)	-0.0429*** (0.0158)	-0.0126 (0.0150)
Mean Callback	0.13	0.30	0.25	0.22	0.30
Controls	Y	Y	Y	Y	Y
Fixed Effects for Job ad	Y	Y	Y	Y	Y
Observations	1,502	1,465	1,537	1,493	1,477
R-squared	0.610	0.659	0.556	0.625	0.710
Wald statistic			6.15		
p-value			0.1885		

Notes: The table presents regression results of callback on foreign work experience separately for each firm industry. The last row presents results from a test of equality between coefficients of foreign work experience across industries. Robust standard errors, clustered at the resume level, are in parentheses. Regressions include a constant term. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 1.8: The Effect of Foreign Experience on Callback Rates By Quality of Resume

	(1)	(2)	(3)	(4)
	Callback Low Quality	Callback High Quality	Callback Low Quality	Callback High Quality
Has Foreign Experience=1	-0.0228** (0.0093)	-0.0310*** (0.0097)		
Length of foreign experience			-0.0046*** (0.0015)	-0.0049*** (0.0016)
Mean Callback	0.22	0.26	0.22	0.26
Controls	Y	Y	Y	Y
Fixed Effects for Job ad*Quality	N	N	Y	Y
Observations	3,735	3,739	3,735	3,739
R-squared	0.786	0.787	0.786	0.787
Wald statistic		0.76		0.05
p-value		0.3846		0.8151

Notes: The table presents regression results of callback on foreign work experience by subsample of quality of resume. The last row presents results from tests of equality between coefficients of foreign work experience across subsamples. Robust standard errors, clustered at the resume level, are in parentheses. Regressions include a constant term. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 1.9: The Effect of Cover Letters

	(1) Callback For control resumes	(2) Callback For foreign resumes
Cover = move abroad cancelled	0.0393** (0.0200)	
Cover = stay abroad finished		-0.0070 (0.0165)
Mean Callback	0.25	0.23
Controls	Y	Y
Fixed Effects for Job ad	Y	Y
Observations	3,752	3,722
R-squared	0.749	0.751

Notes: The table presents regression results of callback on cover letter for the subsamples of control and foreign resumes. Robust standard errors, clustered at the resume level, are in parentheses. Regressions include a constant term. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 1.10: The Effect of Foreign Experience at the Extensive and Intensive Margins

	(1) Callback	(2) Callback
Has Foreign Experience=1	-0.0043 (0.0153)	-0.0039 (0.0146)
Length of foreign experience	-0.0043* (0.0024)	-0.0042* (0.0023)
Mean Callback	0.24	0.24
Controls	Y	Y
Fixed Effects for Job ad	Y	N
Fixed Effect for Job ad*Quality	N	Y
Observations	7,474	7,474
R-squared	0.639	0.787

Notes: The table presents regression results that include both the dummy variable of having foreign work experience and years of foreign work experience in the same equation. Robust standard errors, clustered at the resume level, are in parentheses. Regressions include a constant term. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 1.11: Comparing Treatment Effects of the Main and Sub Experiment

Panel A: All Industries			
	Main Experiment (n = 7474)	Sub Experiment (n = 1980)	Difference
<i>With controls</i>			
Has Foreign Experience=1	-0.0280*** (0.0071)	-0.0169 (0.0146)	-0.0111 (0.0140)
Length of foreign experience	-0.0048*** (0.0011)	-0.0038* (0.0021)	-0.0010 (0.0016)
Panel B: By Firm Industry			
	Main Experiment	Sub Experiment	Difference
<i>With controls</i>			
Has Foreign Experience=1			
Admin	-0.0120 (0.0128)	0.0119 (0.0260)	-0.0239 (0.0248)
Construction	-0.0453*** (0.0164)	0.0012 (0.0355)	-0.0465 (0.0334)
Finance	-0.0306* (0.0178)	-0.0263 (0.0338)	-0.0043 (0.0327)
Sales	-0.0429*** (0.0158)	-0.0668* (0.0367)	0.0240 (0.0342)
IT	-0.0126 (0.0150)	-0.0146 (0.0305)	0.0020 (0.0291)
Length of foreign experience			
<i>With controls</i>			
Admin	-0.0025 (0.0019)	0.0026 (0.0036)	-0.0051* (0.0029)
Construction	-0.0081*** (0.0026)	0.0029 (0.0044)	-0.0110*** (0.0036)
Finance	-0.0051* (0.0026)	-0.0071 (0.0047)	0.0020 (0.0038)
Sales	-0.0071*** (0.0024)	-0.0128** (0.0059)	0.0058 (0.0045)
IT	-0.0018 (0.0023)	-0.0044 (0.0047)	0.0025 (0.0036)

Notes: The table reports coefficient estimates of the effect of foreign work experience on callback for the main and sub-experiments. The last column presents results from testing the difference between coefficients found in the main and sub-experiments. Robust standard errors, clustered at the resume level, are in parentheses. Regressions include a constant term. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

CHAPTER II

The Return Motivations of Legal Permanent Migrants: Evidence from Exchange Rate Shocks and Immigrants in Australia

2.1 Introduction

Many individuals who live and work outside their countries of birth eventually return home. While official government statistics are often lacking, indirect estimates from different countries over time suggest considerable flows: Jasso and Rosensweig (1982) for example suggest that more than 20 percent of immigrants chose to re-migrate from the US in the 1970s. Dustmann and Weiss (2007) estimate that 40% of all male immigrants and 55% of female immigrants left the UK within five years of arriving in the 1990s. Most recently, Gibson and McKenzie (2011) find that over a quarter of the “best and brightest” students who ever migrated from three Pacific countries ultimately ended up returning (33% in Tonga, 27% in Papua New Guinea, and 26% in New Zealand).

That migrants voluntarily choose to return in substantial numbers poses a puzzle. People move to where they earn the most, at least according to traditional economic theory (Sjaastad 1962; Harris and Todaro 1970). Hence, most returns should occur when earnings in places of origin surpass those at the destination. Yet earnings in

migrant-sending countries rarely overtake receiving countries'. There should be little or no return. Reality appears to defy this simple prediction.

More nuanced theories go beyond income maximization and appeal to the inclination of migrants to invest or consume in their home countries. Such theories allow for marginal changes in home country conditions to matter for migrant behavior, without wage level reversals. Two competing models are at the forefront: those that see migrants as target earners or life-cycle agents. As a target earner, a migrant is credit constrained, so she works abroad until she accumulates a sufficient level of savings to finance an enterprise upon returning home (as in Piore 1979 and Mesnard 2004). The primary motive is investment. As a life-cycle agent, a migrant weighs the marginal benefits of obtaining higher income in the host country versus the marginal costs of remaining overseas, since home country consumption is preferred (see for instance Stark, Helmenstein and Yegorov 1997 or Dustmann 2003). The goal is to consume. The two have separate predictions on how migrants respond to home country factors. For example, a target earner is thought to cut her stay abroad *shorter* when her purchasing power for the home country increases while a life-cycle migrant makes her stay *longer*.¹

The empirical investigation for reasons of migrant return related to home country considerations is scant and limited to particular contexts. Governments seldom record the flow of migrants, let alone track their locations over time. Another impediment is the difficulty of isolating exogenous variation in factors that affect return, limiting the ability for causal inference. Most studies focus on correlations. Constant and Massey (2002), for example, relate covariates measuring social and economic attachments in the home country with migrant return and find that these are strongly associated for a sample of German guest workers. Kirdar (2013) demonstrates that German immigrants shorten their stays overseas when purchasing power increases for their home

¹This is true if the substitution effect dominates the income effects, as I explain in the theory section.

country. A chief concern with these studies, however, lies with omitted variable bias, as source country factors are possibly endogenous to variables that are unobserved. That migrants with more social attachments at home are more likely to return need not imply a causal relationship. The group may simply possess other unmeasured characteristics related to social attachments that make return appealing.

Yang (2006) perhaps comes closest to identifying the causal impact of changing home country conditions on return. To confront endogeneity, he utilizes an unexpected event, the 1997 Asian Financial Crisis, when substantial and varied exchange rate shocks were realized between the Philippine peso and foreign currencies. Filipino migrants work in a diverse set of countries abroad so it was as if each of them were randomly allocated different exchange rate shocks during this period. By comparing the behavior of Filipino migrants who experienced greater and smaller shocks, the paper establishes the causal impact of changing exchange rates on the decision of migrants to return home. Filipino migrants appear to be driven by life-cycle considerations. They prolong their stay abroad when they experience favorable changes to their purchasing power at home.

This paper focuses on Australian permanent immigrants and their motivations for return. I employ a strategy similar to Yang (2006) in using exchange rate shocks brought about by the Asian Financial Crisis, except I look at a mirror image: data from a destination country on immigrants from multiple origin countries. Doing so provides several new insights that complement previous research: First, because the source of variation is in places of origin rather than destination, I distinguish the effects of exchange rate shocks from other home country shocks, such as changes in GDP and unemployment, that may also influence return. Second, I capture households whose members have all migrated and would have otherwise been absent in data collected from the home country, a limitation of Yang (2006). Third, Yang (2006) primarily focuses on Filipino migrants on temporary work contracts abroad. It is un-

clear whether his results generalize for other types of migrants as well, such as those granted permission for indefinite stay at the destination. For this set of individuals, a reasonable prior in fact is that there could be no motivation for return at all. I am able to test this hypothesis.

Australia is a natural setting to study migration because of its large immigrant community; 24.7% of its population is foreign-born. Most immigrants are legal permanent residents (as opposed to undocumented), whose immediate relatives are already present in the host country.

My main contribution is the finding that a 10% home country currency depreciation leads to a 0.37 percentage point reduction in the probability that a migrant returns.² The 2-year permanent return rate in the period is 4.1%, so the effect is equivalent to almost 10% of the return rate. The result is robust and consistent with the story that migrants return because of life-cycle considerations. The effect is strongest for migrants who have pre-determined they want to return, weak for those initially undecided, and null for those who originally stated their desire to stay. This is evidence that migrants seek to optimally *time* their return, rather than *decide* whether or not to return, based on favorable conditions. Moreover, I show evidence that the effect of the exchange rate shocks does not merely proxy for the influence of other macroeconomic conditions such as GDP per capita growth or the change in unemployment in the home country. Evidence suggests that return is more a function of purchasing power and consumption rather than employment possibilities in the origin country.

Migrant sending countries often lament losing highly skilled nationals to richer countries through international migration, while return is often seen as the reverse, as migrants bring back essential human capital. With governments keen on enacting policies that encourage return, distinguishing between motivations of legal permanent

²A standard deviation change in the exchange rate during this period is 29%.

migrants is crucial in understanding how best to motivate migrants to return, and to understand their potential effects to the economy.

2.2 Theoretical Framework

What can responses to exchange rate shocks reveal about the motivations of migrants to return? I present here the life cycle and target earnings models, patterned after the models presented in Dustmann (2003) and Mesnard (2004). I highlight the role played by exchange rates in influencing migrant behavior.

Consider a migrant, who currently resides in a foreign country (Australia in this case) at time 0 and whose lifespan extends until time 1. For simplicity, assume that there is no discounting between periods, the interest rate equals zero, and that agents have perfect foresight. Hence, given preferences for foreign and home consumption, $u_f(c_f)$ and $u_h(c_h)$, a migrant maximizes her lifetime utility by concurrently choosing the amount of consumption in the foreign country c_f , consumption at home c_h , and duration of stay abroad t , where $0 < t \leq 1$. Assume prices to be normalized to 1 in both countries. Further, assume that the migrant favors consumption at home to consumption abroad.

There exist two types of migrants: lifecycle consumers, who are only capable of being wage earners at home³, and target earners, whose goal abroad is to accumulate resources in order to invest in a small business at home. The wage abroad for both types is w_f . An exchange rate E converts Australian currency to home country currency.

Upon return, a lifecycle migrant works for a wage w_h . A target earner, on the other hand, invests in a business that provides a high-income stream of y where $y > Ew_f > w_h$. Assume in this case that self-employment cannot be done simultaneously

³Perhaps because they do not have appetite for self-employment or simply do not have access to business ideas.

with working for a wage. In addition, starting a business requires collateral, C , which can only be financed through savings abroad. Credit constraints bind.

This difference between life cycle consumers and target earners allows for deriving conditions such that the two are distinguishable from their responses to exchange rate shocks to their home country currencies.

2.2.1 Lifecycle Consumers

The maximization problem for a lifecycle consumer is as follows:

$$\max_{c_f, c_h, t} tu_f(c_f) + (1 - t)u_h(c_h) \text{ such that}$$

$$tc_f + S_t \leq tw_f \tag{2.1}$$

$$(1 - t)c_h \leq (1 - t)w_h + ES_t \tag{2.2}$$

where equations 2.1 and 2.2 are the budget constraints for the period spent abroad (t) and at home ($1 - t$). S_t represents accumulated savings up to time t . Considering for the moment only interior solutions, then equations 2.1 and 2.2 are satisfied with equality and equation 2.2 can be substituted into equation 2.1 for S_t .

The first order condition of the corresponding Lagrangian with respect to t is given by equation 2.3 where λ is the marginal utility of wealth:

$$u_f(c_f) - u_h(c_h) + \lambda(Ew_f - w_h + c_h - Ec_f) = 0 \tag{2.3}$$

The result is fairly intuitive. With a preference to consume at home, the life-cycle migrant balances the marginal cost of remaining abroad $u_f(c_f) - u_h(c_h)$ with the marginal benefit of higher earnings abroad represented by the term $\lambda(Ew_f - w_h + c_h - Ec_f)$. The optimal duration of stay abroad t^* evolves in response to a shock in

E . Equation 2.4 describes the response

$$\frac{dt}{dE} = \frac{-b\lambda(w_f - c_f)}{a^2} + \frac{at(w_f - c_f - E\frac{\partial c_f}{\partial E})}{a^2} \quad (2.4)$$

where $(w_f - c_f) \geq 0$ and $\frac{\partial c_f}{\partial E} < 0$ because of a first order condition, $b = Et\frac{\partial c_f}{\partial \lambda} + (1-t)\frac{\partial c_h}{\partial \lambda}$, and $a = -(Ew_f - w_h + c_h - Ec_f)$. The details of the comparative statics exercise are in the Appendix but the proof is similar to Mesnard (2004). Since the marginal utility of wealth is positive and it can be shown that $b < 0$ and $a \leq 0$, the response to a favorable (positive) change to the exchange rate depends on two effects. First, a substitution effect, $\frac{-b\lambda(w_f - c_f)}{a^2} > 0$, induces the migrant to stay longer abroad; the shock provides an incentive to accumulate more resources abroad. But an opposing income effect, $\frac{at(w_f - c_f - E\frac{\partial c_f}{\partial E})}{a^2} < 0$, encourages the migrant to cut her stay abroad short because of the higher spending power permitted at home by an increase in E . While the sign of the total effect is ambiguous, the overall result, if the substitution effect turns out to dominate the income effect, is that migrants prolong their stay in the foreign country because of a favorable exchange rate shock. The prediction allows the identification of a life-cycle consumer because, as I show in the next part, a target earner does not quite respond to an exchange rate shock in the same way.

2.2.2 Target Earners

The corresponding optimization problem for a target earner is as follows:

$$\max_{c_f, c_h, t} tu_f(c_f) + (1-t)u_h(c_h) \text{ such that}$$

$$tc_f + S_t \leq tw_f \quad (2.5)$$

$$(1-t)c_h \leq (1-t)y + ES_t - C \quad (2.6)$$

$$ES_t \geq C \quad (2.7)$$

Consider here once again only interior solutions such that equations 2.5, 2.6, and 2.7, are satisfied with equality. In particular, note that at the optimum, $ES_t = C$. A migrant stays abroad only up to the point where her target savings are met. This makes sense: there is otherwise no point delaying return until $ES_t > C$ since investment at home fetches greater per period income y than w_f when consumption at home is preferred. But consider also the other possibility that the collateral C needed to start up a business is so high that it cannot be financed by accumulated savings even when the migrant stays abroad until the end of his life ($w_f < C$). Here, the migrant will simply revert to acting like a lifecycle consumer and solves the corresponding optimization problem. The solution is straightforward and the details are left to the appendix. The first order condition that describes the optimal choice of t is given by equation 2.8.

$$u'_f \left(w_f - \frac{C}{Et} \right) \left(\frac{C}{Et} \right) + u_f \left(w_f - \frac{C}{Et} \right) - u_h(y) = 0 \quad (2.8)$$

Consequently, the change in t^* that results from a change in the exchange rate amounts to

$$\frac{dt}{dE} = -\frac{t}{E} \quad (2.9)$$

This is always negative. Hence, for target earners, a favorable exchange rate shock leads to an unambiguously shorter stay abroad.

To summarize, if the motivation of a migrant for return is mostly to invest, then her expected response to a favorable exchange rate shock is to shorten her stay abroad. Observing otherwise allows us to reject the target earnings model in favor of one where the migrant is dominated by life-cycle considerations and the concern is primarily to consume. In such a model, a migrant lengthens her stay abroad at the onset of a favorable exchange rate shock if the substitution effect dominates the income effect.

But it is of course equally plausible that the return decisions of migrants do not all respond to exchange rate shocks, perhaps because migrants do not actually prefer consumption at home (a starting assumption) or that the solution to the above models are at the corner and $t^* = 1$.

These observations inform the interpretation of the results that will come from the empirical section. I provide evidence that legal permanent migrants in Australia are likely to be life-cycle consumers and do in fact respond to home country considerations.

2.3 The Asian Financial Crisis of 1997 and its Impact on Australia

While few observers had hinted at the possibility of a crash⁴, the crisis that eventually beset the booming East and Southeast Asian economies of the 1990s is largely regarded to have been unexpected. Telltale signs were, at least, absent: savings rates were high, inflation was low, and fiscal accounts were balanced (Radelet and Sachs 1998). Credit agencies such as Standard and Poor's and Moody's provided no indication of changing risk in country ratings until after the crisis had begun.

The Asian Financial Crisis officially started in July 1997 with the devaluation of the Thai baht. The event triggered a wave of capital flight from the region as foreign investors withdrew funds, speculating on the weakness of surrounding economies. Five countries were most affected: Thailand, Indonesia, South Korea, Malaysia, and the Philippines. In the year before the crisis, inflows of foreign capital into these countries amounted to \$97.1 billion. In just a year after, outflows were estimated to be \$18.1 billion (Radelet and Sachs 1999). Hong Kong, Singapore, Taiwan, and Laos suffered considerable economic losses as well, albeit to a lesser degree. Currency

⁴See, for instance, Park (1996) who warned about the excessive influx of foreign capital into East Asia. He suggested that it was both speculative and short term and that some controls might be necessary to discourage capital movements.

devaluations followed. What economic analysts had previously dubbed the “Asian Economic Miracle” had come to an end.

For the most part, Australia came out unscathed. Diminished regional demand for its exports was a brief concern, but while exports did subsequently decline (Gunawardana 2006), the impact on the local economy was negligible. Real GDP continued to grow by 4.0% during 1997-98, up from 2.8% in the previous period; unemployment fell from 8.7% to 8.3%; and private consumption and business investment actually rose by 4.6% and 11.6% from the previous year.⁵ Makin (1999) attributes the resilience to the switching of international capital out of Asian markets into Australasian and other markets. The flows kept interest rates low and asset values high in advanced economies.

The Asian Financial Crisis makes for a compelling natural experiment. That Australia was relatively unaffected holds constant the local economic conditions faced by immigrants in the country. But since these migrants come from a variety of backgrounds, each experienced different home country shocks from the crisis. Thus, an approach to understand what motivates return is to observe which migrants were more likely to come back, by comparing the behavior of those faced with different shocks. Most notable among shocks were exchange rate changes that occurred between home country currencies and the Australian dollar. Migrants had their home country currencies appreciate or depreciate to varying degrees in a way that was unexpected and plausibly random.

Figure 2.1 depicts the exchange rates during the time of the Asian Financial Crisis between the Australian dollar and foreign currencies of the top 15 home countries of migrants in the data. The exchange rates are expressed in foreign currency over Australian dollar (e.g. PHP/AUD) and are normalized to 1 in January 1996 for ease of comparison. An increase represents foreign currency depreciation with respect to

⁵Queensland Treasury and Trade (1998) <<http://www.qgso.qld.gov.au/products/reports/annual-econ-report/annual-econ-report-1997-98.pdf>, accessed June 21, 2013>.

the Australian dollar, and signifies a higher purchasing power for the migrant looking to come home. A structural break in trends occurs around July 1997, the start of the crisis. Variation around this period is what the study exploits.

2.4 Data and Descriptive Statistics

I employ data from the Longitudinal Survey of Immigrants to Australia (LSIA1), a nationally representative study of principal immigrant applicants issued permanent visas offshore who arrived in Australia between 1993 and 1995.⁶⁷ The survey was conducted in three waves of interviews and I focus on the 2nd and 3rd waves, which were implemented from 1995-1997 and 1997-1999 respectively. This nicely corresponds to years prior to and after the Asian Financial Crisis. The main sample thus consists of 3069 principal immigrants aged 15 to 60 years old who have identifiable countries of birth and historical exchange rate data available for their origin countries.

As part of its migration program, the Australian government allocates permanent visas under five broad categories: the Preferential Family, Concessional Family, Business Skills and Employer Nomination Scheme, Independent, and Humanitarian. The labor market has always played a crucial role in this structure. Applicants under the independent and concessional family streams are subject to a points test, where they are allocated points by satisfying criteria deemed in demand by the labor market (such as age, education, experience, English language ability, etc.). Visa eligibility is determined by passing a predetermined threshold of points. Employment Nomination is reserved for firms sponsoring workers. On the other hand, Business Skills are granted for entrepreneurs who have invested a certain amount of capital in the country. The Preferential Family and Humanitarian visa streams are the only categories that do not depend on economic circumstances. The former is reserved for

⁶The source of the data is the Department of Immigration and Citizenship of the Australian Government <<http://www.immi.gov.au/media/research/lisia/lisia01.htm#x1>, accessed June 21, 2013>.

⁷The survey excludes New Zealanders who comprise majority of immigrant inflows to Australia.

close relatives of Australian citizens or permanent residents while the latter are for refugees and their family members. The number of visas issued per year is capped. For 1993-1994, the total number granted for all streams was 76,870 (Phillips, Klapdor and Simon-Davies 2010).

Table 2.1 describes the resulting composition of immigrants in the main sample. Those that come are typically young (aged 33), married, and well educated (42% have at least a bachelor's degree). Australian immigrants obtained legal residence most commonly through family sponsorship, and they arrive initially with a significant amount of funds (over 25,000 AUD on average). A majority of principal applicants declare typical household members to be present with them in Australia by 1995-1997. 60% of households do not have members remaining in their home countries. The number increases to 71% if one only considers close relatives (spouse, son, or daughter). Only 19% sent money to relatives or friends overseas in the course of the past 2 years.

Immigrants to Australia come from a diverse set of countries. Table 2.2 presents a tabulation of individuals from the top 15 source countries in the sample. England is the primary source with 281 individuals, but many other countries are fairly evenly represented. Asian countries most affected by the 1997 crisis (Indonesia, South Korea, Thailand, Malaysia, the Philippines) take up a considerable share.

The analysis assigns migrants exchange rate shocks by calculating the change in their home country exchange rate that occurred in the period between their wave 2 and wave 3 interviews.⁸ I follow Yang (2006) in using nominal instead of real exchange rates since data on the former are available at a daily frequency, allowing

⁸Specifically, I compute the average exchange rate a year prior to a migrant's interview date in wave 2 and correspondingly for wave 3 then calculate the percentage change between periods by subtracting log values of the former from the latter. Alternatively, computing exchange rate shocks by simply calculating the change in the exchange rates between waves 2 and 3 *at the exact day* the migrants were interviewed does not change the results of the analysis. For migrants who were not interviewed in wave 3 and were therefore not assigned an interview date, I assume a most likely interview date. This is taken from the interview group they belonged to and I use the mean interview date of that group.

for the exchange rate changes to be calculated exactly prior to and after interview dates. Daily historical exchange rates were obtained online from Oanda Corporation.⁹ The exchange rates are expressed in home country currency over Australian dollars such that an increase represents a depreciation of the home currency while a decrease signifies an appreciation with respect to the Australian dollar. Increases in the exchange rate can be thought of as favorable to immigrants since these raise the foreign currency value of earnings when utilized for home country consumption.

How were country currencies of migrants affected by the Asian financial crisis? The last column of Table 2.2 calculates mean exchange rate shocks experienced by individuals from origin countries going from wave 2 to 3 of the survey. On average, country currencies depreciated by 10% with respect to the Australian dollar, but the shocks were varied. A number of countries saw their currencies appreciate. Some even experienced extreme changes: with Bulgaria's currency depreciating by 310%, Turkey by 112%, and Romania by 98%. I continue to include migrants from all these countries in the analysis for lack of any objective rule to exclude them, but I conduct robustness checks to show that the results do not rely on their presence.

The outcome variable of interest is return migration captured by an attrition indicator, described in Table 2.3. Enumerators noted the reason a respondent could not be interviewed in a particular wave. If the respondent was found absent, they asked a friend or relative most likely to know about the respondent's whereabouts. I use "Overseas Permanently" as the indicator for return, assuming that this accurately reflects return migration. It is distinct presumably from "Overseas Temporarily" which describes visits home or trips to other countries.

Measuring return migration in this manner makes the analysis susceptible to measurement error. For instance, "Overseas Permanently" could mean that the migrant moved to another country overseas instead of back to the home country. I discuss

⁹<<http://www.oanda.com/currency/historical-rates/>, accessed March 13, 2013.>

later the implications of such threats and present robustness checks to verify that results are insensitive to relaxing measurement error assumptions.

2.5 Empirical Results

The main equation I estimate is as follows:

$$RETURN_{ic} = \alpha + \beta_1 \Delta \ln ERATE_{ic} + \beta_3 \Delta YEARS_{ic} + \beta_4 YEAR_{ic} + \varepsilon_{ic} \quad (2.10)$$

where $RETURN_{ic}$ is a dummy indicating whether migrant i from country c returned between waves 2 and 3 and $\Delta \ln ERATE_{ic}$ is the percentage change in home country exchange rate between interviews. β_1 is the coefficient of interest, indicating the effect of a 1% increase in exchange rates on the probability of return. Since the number of years between interviews varied per migrant, I account for this by including $\Delta YEARS_{ic}$, although this is two for most. $YEAR_{ic}$ are year dummies which indicate when the interview for wave 2 was conducted for migrant i . This is either 1995, 1996, or 1997 and allows for time trends in migrant return. ε_{ic} is the disturbance term which is assumed to be uncorrelated with $\Delta \ln ERATE_{ic}$. I cluster standard errors at the country level to allow ε_{ic} to be correlated between individuals interviewed at the same time who are from the same origin country.

Potential omitted variables might still be a worry in this specification. In particular, certain migrant households might just happen to have been differently impacted by the Asian Financial crisis in a way that is correlated with both their exchange rate shock and return. This is a violation of the conditional independence assumption and biases the estimate of β_1 . Hence, I estimate an augmented equation 2.11 that includes, X_{ic} , a vector of controls for migrant and household characteristics recorded pre-crisis for each individual (refer to Panel A and B of Table 2.1 again for the list of covariates). I also include country of origin variables that incorporate information on

common language and colonial history with Australia, distance from Sydney, GDP per capita, and indicators for whether the country is included in the list of those hardest hit by the Asian financial crisis.¹⁰

$$RETURN_{ic} = \alpha + \beta_1 \Delta \ln ERATE_{ic} + \beta_3 \Delta YEARS_{ic} + \beta_4 ERATE_{ic} + \beta_5 X_{ic} + \varepsilon_{ic} \quad (2.11)$$

If $\Delta \ln ERATE_{ic}$ is indeed exogenous, then the estimate of β_1 should be unaltered by the addition of controls. To the extent that these controls also help explain return migration, their inclusion should make estimates of β_1 more precise.

2.5.1 Main Result

Table 2.4 provides estimates of β_1 using OLS.¹¹ The 1st column begins with a specification that excludes control variables but I progressively introduce a set of country of origin, household, and migrant characteristics as covariates. The exchange rate shocks are negatively related to the probability of return. When Column 2 includes the log of GDP per capita of the migrant's origin country as a control, the estimated impact diminishes but remains negative and statistically significant. It turns out that log of GDP per capita is an important control variable since migrants from richer countries are more likely to return but also happen to experience more negative exchange rate shocks (an appreciation in their currencies) than those from poorer countries during the financial crisis.¹² Accounting for this, however, does not completely overturn the result. The negative estimate remains robust to including a

¹⁰Data on common language, colonial history, and distance are taken from the GeoDist database at CEPII <<http://www.cepii.fr/anglaisgraph/bdd/distances.htm>, accessed on July 5, 2013>. GDP per capita data are from the World Development Indicators of the World Bank <<http://data.worldbank.org/data-catalog/world-development-indicators>, accessed on July 5, 2013>.

¹¹Probit results are similar to those of OLS and indicate statistically significant estimates in the same direction and for the same variables in all regressions in the paper.

¹²The correlation between $\Delta \ln ERATE$ and $\ln(\text{GDP per capita})$ is -0.18.

host of additional controls on country of origin, household, and migrant characteristics in columns 3, 4, and 5. There is no evidence that certain types of individuals or households were impacted differentially by the financial crisis in Australia in a way that is correlated with their experienced exchange rate shocks.

A 10% increase in the exchange rate leads to a 0.37 percentage point decline in the probability that a migrant returns. This is not trivial, given that a standard deviation change in the exchange rate during the period was 0.29, while the permanent return rate was 4.1%. The effect accounts for almost 10% of the return rate. Legal permanent migrants remain sensitive to home country conditions. As the value of their foreign wages and savings increase with respect to home country currencies, they stay longer at the destination. Hence, life-cycle considerations appear to dominate target-earning motives. Yang (2006) finds the same for his sample of overseas Filipino migrants, mostly temporary contract workers abroad with family members remaining behind. That this effect generally holds for a sample of migrants in Australia is a new finding. These individuals have permanent residence status and hold the option to stay, but they appear to remain influenced by home country considerations.

2.5.2 Differential Effects by Intention to Return

Next, I investigate whether the effect of the exchange rate shocks varies depending on the subgroup considered. LSIA1 asked individuals at baseline, prior to the crisis, whether they intend to return to their home countries sometime in the future. Possible answers included: ‘yes’, ‘no’, and ‘not sure’. I look at whether the exchange rate shocks had varying impacts between individuals with different answers to this question. To do this, I re-estimate equation 2.11 with interaction terms for intention to return and the exchange rate shocks. Table 2.5 below presents the results with different specifications that include or leave out certain controls, while always controlling for country of origin variables, including log GDP per capita which has been

found to be important. Migrants who stated no intention to return are the reference group.

As expected, those who were unsure or stated their desire to return at the onset were more likely to return in wave 3 versus those who said they did not want to return. I cannot reject the null hypothesis that changing exchange rates had no effect on those who had no plans to return. On the other hand, favorable exchange rate shocks to migrants seem to have considerably delayed the return of those who have initially expressed a desire to do so. Thus, exchange rate shocks seem to operate most at the level of changing the timing of return and less on the decision to return. But action at the extensive margin also exists, at least for the undecided. A favorable shock reduces the probability of return, albeit with a smaller magnitude, for migrants who were unsure of return at the beginning.

In regressions not shown, I further investigate differential effects of the exchange rate shocks by a migrant's pre-crisis income level and country of origin GDP per capita. The coefficient estimates turn imprecise but generally show that increases in exchange rates accompany a reduced likelihood of return for all income categories and country of origin GDP per capita.

2.5.3 Are Exchange Rate Shocks Merely a Proxy for Other Macroeconomic Variables?

A concern about the previous regressions might be that the exchange rate shocks merely proxy for other macroeconomic shocks that occurred simultaneously in home countries during the financial crisis. In other words, since exchange rate changes were potentially correlated with variation in GDP growth per capita, unemployment, or prices, then it could be these variables influencing return and not the higher purchasing power resulting from the exchange rates. A direct test would be to include these macroeconomic variables in estimating the main regression equations and observe if

the estimated impact of the exchange rate changes. Table 2.6 displays the results of implementing such an analysis including GDP growth per capita and changes in unemployment in the home country between waves 2 and 3. Table 2.7 does the same for prices as computed from the CPI.¹³ I use only observations without missing values in all indicators to hold the sample constant across regressions.

The main result is insensitive to the inclusion of changes in GDP per capita or unemployment in Table 2.6. Column 1 replicates the main regression for the smaller sample. In column 2, higher GDP growth per capita in the home country appears to increase the likelihood that migrants return, but this effect disappears once the exchange rate shock is accounted for. In column 3, home country unemployment is unrelated to return. No matter how one includes other macroeconomic variables considered here as controls, the effect of the exchange rate shocks is robust.

But the findings provide additional insight. In all of the regressions, the exchange rate changes appear to be the most important determinant of return. Purchasing power and consumption explain migrant return better than employment opportunities and prospects at home.

Table 2.7 shows how changes in the general price level in the home country are related to return. Column 1 is again a replication of the main result while column 2 shows that changing prices demonstrates an effect on return similar to that of the exchange rate shocks. Including both variables in the same regression in column 3 keeps the point estimate for the effect of the exchange rate shock unchanged but precision is lost (it is now significant only at the 14% level). It reverses the sign for

¹³Because data on GDP per capita, unemployment, and CPI are only provided as yearly averages, I cannot compute the change in these variables that occurs exactly between interview dates for the migrants, in the same way I did for the exchange rate for which daily data was available. I settle for using a weighted measure in calculating the changes for these variables. For instance, if a migrant was interviewed on March 1995 for 2nd wave, I assign her country's GDP per capita on that date as 1/4 the value of the measure for that year's plus 3/4 the value of the previous year's. I then do the same for the 3rd wave interview. The resulting change in GDP per capita is going to be the log difference between the two waves. To be consistent, I recalculate the exchange rate shock measures in the same way for these sets of regressions.

the effect of a price change and estimates it to be virtually zero. I interpret this as evidence that price changes serve merely as proxies of the exchange rate shocks.¹⁴ It appears that including price changes in the regression takes away useful variation in the exchange rate while not affecting the return decision, making coefficient estimates imprecise.

The above analyses are of course unlikely to fully refute the idea that there might be other unobserved factors correlated with the exchange rate that also affect return decisions. Nevertheless, given the best available aggregate data on home country economies, the evidence suggests that the shocks operated mostly via exchange rates during the crisis. In the next section, I proceed with further robustness checks.

2.6 Robustness Checks

The previous analysis relies on the assumption that exchange rate shocks during the Asian Financial Crisis were unexpected and exogenous. If so, then the estimates of β_1 presented above are correctly interpreted as causal effects. I have controlled for as many possible confounding factors as the data permits. In this section, I provide additional robustness checks.

Future exchange rate shocks may be systematically related to past migration trends so that the effect is merely capturing pre-existing trends. For instance, migrants exposed to appreciations in their home currency and actually returned could simply belong to countries in the past that have high propensities for return. I conduct two tests to address this concern. First, I run a placebo test where I regress future exchange rate shocks on past return migration. Future exchange rate shocks should not systematically predict return migration in the previous period. Second,

¹⁴In fact, when I re-estimate this regression using a more precise measure of the exchange rate shock that occurred exactly between interview dates from wave 2 to 3, the coefficient on the exchange rate shock is statistically significant and the same as in column 1 even when including the change in the CPI as a control.

I re-estimate equation 2.11 adding lagged values for previous exchange rate shocks. The tests verify that the exchange rate shocks during the Asian Financial crisis do not merely reflect past trends.

Table 2.8 presents the falsification exercise. On Panel A, I regress the exchange rate shocks from the Asian financial crisis on the return indicator calculated from wave 1 to wave 2 of the survey. On Panel B, I regress the return variable from wave 2 to wave 3 on future exchange rate shocks calculated from wave 3 to 2 years after. In both cases, I cannot reject the null that future exchange rate shocks do not predict past return.

Table 2.9 presents the results when I account for lagged exchange rate shock variables. These variables are always computed using 2-year changes in the exchange rate in order to conform to the exchange rate shock measured between wave 2 and 3, which are typically 2-year changes. Column 1 provides the baseline result from the main table again for comparison. I restrict the sample to those with observations for lagged periods of the exchange rate shock to achieve consistency with the subsequent columns. Columns 2 and 3 include lagged variables one period before and two periods before as regressors. The point estimate for the coefficient of $\Delta \ln ERATE$ is unchanged in both. In column 4, I run a regression controlling for the long-term trend in country exchange rates, specified as the change in exchange rates for the past 10 years. In column 5, I control for a future exchange rate shock, measured as the change 2 years after the last year of interview. The conclusion from the baseline result remains unchanged. These regressions show that the effect of exchange rates does not merely reflect past trends; it is contemporaneous exchange rate shocks that influences return migration. In some way, this validates the focus on the period prior to and after the Asian Financial Crisis. It is during this window that shifts in the exchange rate appear to be unrelated to past trends, hence likely to be exogenous to migrants who were faced with them.

A second concern is that outliers may be driving the results. Recall, certain countries had their currencies depreciate by as much as 100% during the period vis-à-vis the Australian dollar. Table 2.10 depicts what happens to the main regression when extreme observations are systematically dropped from the data. Column 1 again uses the full sample. Column 2 drops the migrants from the top 3 countries with the most extreme currency depreciations (Bulgaria, Turkey, and Romania) and column 3 drops the top 5 (adding Nigeria and Venezuela). Column 4 drops migrants who obtained above the 99th percentile of the exchange rate shock while columns 5 and 6 trim those above the 95th and 90th percentile respectively.¹⁵ In all six cases, the effect of the exchange rate shock remains negative and significant with some evidence that trimming for extreme values even magnifies the effect. Outliers appear not to be driving the result.

A third concern involves measurement error. The dependent variable, return, relies on information from a friend or relative of the migrant that she returned “overseas permanently.” There are several ways in which this report might be inaccurate. “Overseas permanently” could reflect other reasons for attrition that the friend or relative was unaware of. It may also capture instances of migrants being overseas, only for a temporary trip or moving permanently to another country. The following analysis checks for instances in which measurement error in the dependent variable introduces bias by being systematically related to the exchange rate shocks.

In the analysis, “overseas permanently” was interpreted to mean return home but could also mean that the migrant moved to another country permanently. To be a threat to identification though, it must follow that permanently migrating to other countries is somehow determined by home country exchange rates. I cannot fully rule out this possibility yet it is improbable that this could yield the estimates that I find. For this explanation to account for the results, for example, those who

¹⁵The 99th percentile exchange rate shock is 1.2; the 95th percentile is 0.73; and the 90th percentile is 0.29.

moved to *another* country should also have had larger appreciations in the currency of their place of *origin* than those who did not move. This is quite unlikely on two counts. One, almost zero percent of respondents in wave 2 said that they “expect to immigrate to another country [aside from their former country] in the future.” The response to this question is tabulated in Table 2.11. Even dropping these individuals in the analysis has no effect on the results. Second, the fact that the exchange rate shocks had the most effect on those who said they intend to return to their home country during the baseline makes it improbable that a large fraction of migrants were moving elsewhere. Thus, while “overseas permanently” perhaps captures movement to other countries as well, this measurement error most realistically introduces itself as random noise. The fact that the regressions are still able to measure the parameter of interest with statistical significance suggests this is not a huge concern.

Another possibility is that measurement error, arising from other reasons of sample attrition listed in Table 2.3, is driving the results. It may, for instance, coincidentally happen that those who were noted as “unable to track” contain those who have left for home permanently, in a way that is also related to the exchange rate shocks. At the same time, migrants traveling home could be systematically mistaken as permanent returnees when they are in fact merely visiting. There is little evidence, however, that exchange rate shocks are related to any of these other reasons for attrition. Table 2.12 presents such an exercise where I regress each of these other reasons for attrition on the exchange rate shock. Only “out of scope” is predicted by the exchange rate shocks with some statistical significance, and even then, the association is virtually zero. Further, if I redo the analysis and expand the definition of return migration to include “overseas temporary” instead of just “overseas permanently,” the results are qualitatively unchanged. These results are excluded in this paper but are available upon request.

2.7 Conclusion

The United Nations estimates that more than 232 million people (around 3% of the world's population) are international migrants.¹⁶ Economists are just starting to understand how this growing group continues to relate to the countries where they are from. Remittances remain at the center of the conversation because of their magnitude. The developing world received \$435 billion in remittances from international migrants in 2014 according to estimates by the World Bank (2013).¹⁷ But return migration is another potentially important avenue that source countries stand to benefit from. It is, however, less understood.

Migrant sending countries often lament the loss of their skilled nationals because many obtain legal permanent residence in rich countries. For this reason, return migration is often viewed positively and pursued by national governments. A returnee theoretically makes newly acquired skills, knowledge, and connections from working abroad available in the domestic economy; he invests his accumulated savings from overseas in the home country. But how might governments encourage return and maximize gains from such events? Effective policy depends in part on understanding precise motivations. Target earners benefit from the expansion of credit markets. For example, loans at subsidized rates hasten return and facilitate the start-up of local businesses. On the other hand, such policies may be ineffective for life-cycle migrants. If return is indeed desired, then governments might do better by identifying consumption preferences and promoting them. To my knowledge though, the evaluation of these kinds of programs is lacking and requires additional research.

In this paper, I examined the return motivations of legal permanent migrants in Australia. Such individuals are well educated and mostly have their entire families

¹⁶United Nations Department of Economic and Social Affairs (Population Division) <http://esa.un.org/unmigration/documents/The_number_of_international_migrants.pdf, accessed Jan 31, 2015>

¹⁷<<http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1288990760745/MigrationandDevelopmentBrief23.pdf>, accessed Jan 31, 2015>

present with them abroad. Despite this, I find that they continue to be influenced by home country factors in their decision to return home. A 10% decline in home country exchange rate increases the likelihood of return in a two-year period by 0.37 percentage points. This explains almost 10% of the return rate. The finding is comparable, yet smaller, to what Yang (2006) uncovers for temporary Filipino workers abroad. In that study, exchange rate shocks account for 20% of the return rate in a 12-month period.

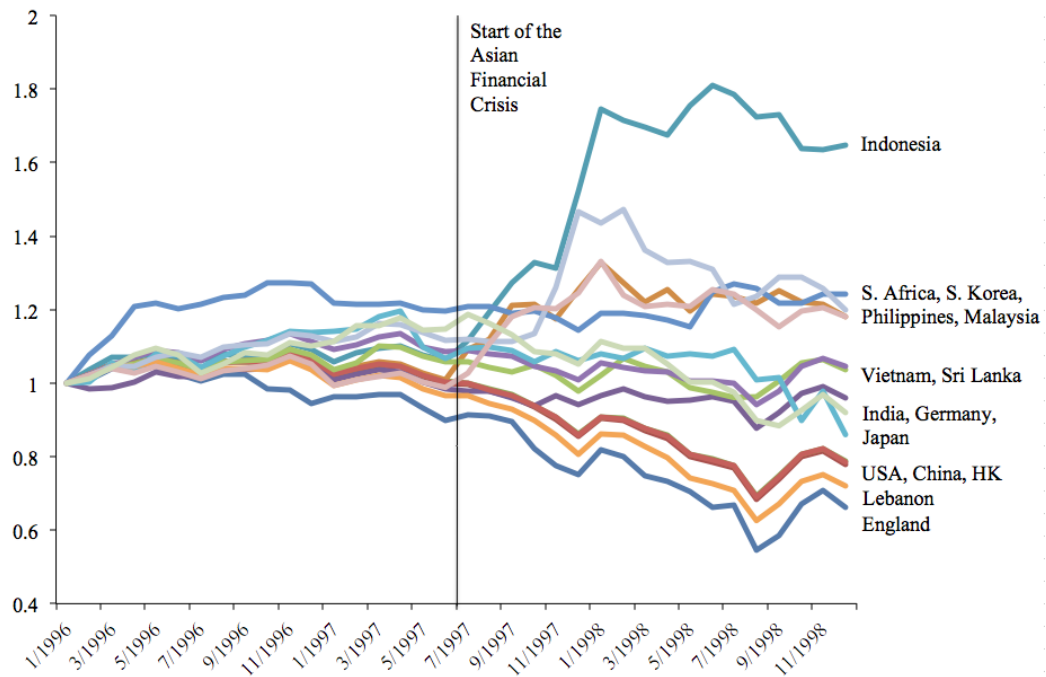
My results support a lifecycle explanation, where returnees are concerned mostly about consumption rather than investment or employment possibilities in their home country. At least for legal permanent migrants here, I do not find them, on average, to be target earners, wishing to generate business activity when they return. Investment may not be the main driver of return migration, as migrant-sending countries might hope. Nevertheless, the contribution of such returning migrants to their home countries may lie elsewhere and deserve further examination.

Looking at subgroups, I find that those with predetermined expectations to re-migrate in the future are most responsive to exchange rate shocks, followed by those who are undecided. Such evidence suggests that migrants time their return to favorable conditions. Unsurprisingly, those who stated no intention of re-migration beforehand do not seem to react to exchange rate shocks at all.

While return migration provides a peek into the economic lives of immigrants, further research is necessary for understanding what influences other behavior, and how this continues or ceases to be tied to home country factors. Nekoie (2013) is a recent paper in this area and considers how the earnings and labor supply of US immigrants are affected in real time by home country exchange rates. Other fruitful areas to investigate are economic decisions such as savings and expenditures that may be affected by home country shocks. Such research would ultimately generate a better picture of what motivates international migrants since return migration is

unlikely to be decided in isolation to other equally important economic factors.

Figure 2.1: Foreign Exchange Rates of the Top 15 Home Countries of Australian Immigrants



Notes: Historical exchange rate data are from Oanda Corporation. The exchange rates are expressed in foreign currency over Australian dollar (e.g. PHP/AUD) and are normalized to 1 in January 1996.

Table 2.1: Descriptive Statistics for the Sample of Immigrants

Panel A: Immigrant Characteristics (N=3069)	Mean	St. Dev	Min	Max
Prop. Male	0.57			
Age	32.72	8.59	15	60
Married	0.72			
Highest Formal Qualification				
Higher Degree	0.12			
Post Graduate Diploma	0.06			
Bachelor's Degree	0.24			
Technical/Professional Qualification	0.23			
Trade	0.07			
12 or more years of schooling	0.13			
11 or fewer years of schooling	0.14			
Visa Classification				
Preferential Family	0.45			
Concessional Family	0.18			
Business Skills & Employer Nomination	0.13			
Independent	0.20			
Humanitarian	0.05			

Panel B: Household Characteristics (N=3069)					
	Mean	St. Dev	Min	Max	
Household Size	3.53	1.85	1	14	
Number of Household Members in Home Country					
0	0.60				
1	0.27				
2 or more	0.13				
AUD value of funds arrived with when first immigrated	26,332	94,439	0	1,100,000	
Average weekly income ^a					
None	0.09				
\$1 to \$57 per week	0.05				
\$58 to \$96 per week	0.03				
\$97 to \$154 per week	0.10				
\$155 to \$230 per week	0.09				
\$231 to \$308 per week	0.07				
\$309 to \$385 per week	0.07				
\$386 to \$481 per week	0.10				
\$482 to \$577 per week	0.10				
\$578 to \$673 per week	0.07				
\$674 to \$769 per week	0.05				
\$770 to \$961 per week	0.07				
\$962 or more per week	0.11				
Household Sent Money Overseas to Relatives/Friends	0.19				
Place of Residence					
New South Wales	0.43				
Victoria	0.23				
Queensland	0.11				
South Australia	0.05				
Western Australia	0.12				
Other	0.06				

Panel C: Other	Mean	St. Dev	Min	Max
Return Rate	0.04	0.20	0	1
Exchange Rate Shock	0.10	0.29	-0.29	3.10
GDP per capita (in USD, PPP)	\$13,977	\$11,353	\$472	\$67,170

^aTo minimize missing observations, I construct average weekly income by taking the maximum between the average weekly income of the primary applicant and the spouse. This is an imperfect measure of household income although all the following regressions are robust to using average income only of the principal applicant. Alternate measures that the LSIA provides include total household income or total weekly income from all sources but these contain many missing observations.

Table 2.2: The Top 15 Source Countries with Mean Exchange Rate Changes Experienced

Origin country	N	percent of sample	percent cumulative	mean exchange rate	exchange rate change
England	281	9.16	9.16		-0.08
Hong Kong	187	6.09	15.25		-0.05
China (excluding Taiwan)	153	4.99	20.23		-0.07
India	145	4.72	24.94		0.08
Philippines	126	4.11	29.06		0.14
South Africa	121	3.94	33.01		0.18
United States of America	105	3.42	36.43		-0.04
Japan	78	2.54	38.97		0.16
Lebanon	78	2.54	41.51		-0.10
Malaysia	74	2.41	43.92		0.14
South Korea	73	2.38	46.30		0.24
Indonesia	72	2.35	48.65		0.72
Turkey	72	2.35	53.27		1.12
Germany	70	2.28	55.33		0.08
Thailand	63	2.05	57.25		0.20
Other	1371	44.67	100		0.08
Total	3069	100	100		0.10

Table 2.3: Reasons for Sample Attrition

Reason	Description
Unable to Track	Address information not current or inadequate. Migrant was not contacted and current location unknown.
Refused	Migrant refused interview.
Overseas Temporarily	Information given that migrant has left Australia for the scheduled interview period, but intends to return to Australia.
Overseas Permanently	Information given that migrant has left Australia and does not intend to return.
Out of area	Migrant settled in area too distant from capital city to be economically viable to interview.
Other	Migrant too sick to interview, deceased, other reasons.

Table 2.4: The Effect of Exchange Rate Shocks on Permanent Return Migration

	(1)	(2)	(3)	(4)	(5)
$\Delta \ln \text{ERATE}$	-0.0512*** (0.0128)	-0.0380*** (0.00948)	-0.0366*** (0.0109)	-0.0389*** (0.00988)	-0.0373*** (0.0104)
$\ln(\text{GDP per capita of origin country})$		0.0172*** (0.00321)	0.0161*** (0.00340)	0.0139*** (0.00396)	0.0155*** (0.00441)
Other Country of Origin controls	N	N	Y	Y	Y
Household controls	N	N	N	Y	Y
Individual Migrant controls	N	N	N	N	Y
N	3069	3069	3069	3069	3069
R^2	0.007	0.016	0.016	0.027	0.028

Notes: The dependent variable is a dummy variable indicating that the individual is reported to be “overseas permanently” (assumed here to have returned to country of origin). Exchange rates are in terms of foreign currency per Australian dollar. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and migrant controls include age, sex, highest educational attainment, household size, marital status, type of visa upon admission, state of residence, average weekly income and Australian dollar value of funds arrived with when first immigrated.

Robust standard errors in parentheses, clustered at the country of origin level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2.5: The Effect of Exchange Rate Shocks by Intention of Return

	(1)	(2)	(3)
Intend to Return=NOT SURE	0.0555*** (0.0104)	0.0502*** (0.0106)	0.0501*** (0.0103)
Intend to Return=YES	0.178*** (0.0433)	0.172*** (0.0429)	0.169*** (0.0425)
$\Delta \ln\text{ERATE}$	-0.0119 (0.0106)	-0.0151 (0.00942)	-0.0130 (0.0157)
$(\Delta \ln\text{ERATE}) \times$ (Intend to Return=NOT SURE)	-0.0625*** (0.0172)	-0.0551*** (0.0175)	-0.0568*** (0.0184)
$(\Delta \ln\text{ERATE}) \times$ (Intend to Return=YES)	-0.233*** (0.0757)	-0.225*** (0.0747)	-0.224*** (0.0748)
Country of Origin controls	Y	Y	Y
Household controls	N	Y	Y
Individual Migrant controls	N	N	Y
N	3069	3069	3069
R^2	0.050	0.057	0.057

Notes: The dependent variable is a dummy variable indicating that the individual is reported to be “overseas permanently” (assumed here to have returned to country of origin). Intend to Return is an indicator variable that captures the immigrant’s response to the question in wave 2, “Do you intend to return to your home country?” Possible answers were: ‘yes’, ‘no’, and ‘not sure.’ Exchange rates are in terms of foreign currency per Australian dollar. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and immigrant controls include age, sex, highest educational attainment, household size, marital status, type of visa upon admission, state of residence, average weekly income and Australian dollar value of funds arrived with when first immigrated.

Robust standard errors in parentheses, clustered at the country of origin level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2.6: Are the Exchange Rate Shocks Merely Capturing the Effect of GDP per Capita Growth and Changes in Unemployment in Home Countries?

	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta \ln \text{ERATE}$	-0.0483*** (0.0124)			-0.0440*** (0.0114)	-0.0469*** (0.0120)	-0.0438*** (0.0115)
$\Delta \ln \text{GDPPCAPITA}$		0.175* (0.0995)		0.0928 (0.0966)		0.0838 (0.0896)
$\Delta \text{UNEMPLOYMENT}$			-0.0024 (0.0025)		-0.0013 (0.0024)	-0.0005 (0.0024)
Country of Origin controls	Y	Y	Y	Y	Y	Y
Household controls	Y	Y	Y	Y	Y	Y
Individual Migrant controls	Y	Y	Y	Y	Y	Y
N	2480	2480	2480	2480	2480	2480
R^2	0.037	0.036	0.032	0.037	0.033	0.033

Notes: The dependent variable is a dummy variable indicating that the individual is reported to be “overseas permanently” (assumed here to have returned to country of origin). Exchange rates are in terms of foreign currency per Australian dollar. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and immigrant controls include age, sex, education level, household size, marital status, type of visa upon admission, state of residence, average weekly income in the earlier wave and Australian dollar value of funds arrived with when first immigrated

Robust standard errors in parentheses, clustered at the country of origin level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2.7: Are the Exchange Rate Shocks Merely Capturing the Effect of Changes in the General Price Level in Home Countries?

	(1)	(2)	(3)
$\Delta \ln \text{ERATE}$	-0.0393*** (0.0103)		-0.0418 (0.0281)
$\Delta \ln \text{CPI}$		-0.0361*** (0.0116)	0.00312 (0.0312)
Country of Origin controls	Y	Y	Y
Household controls	Y	Y	Y
Individual Migrant controls	Y	Y	Y
N	3080	3080	3080
R^2	0.032	0.031	0.031

Notes: The dependent variable is a dummy variable indicating that the individual is reported to be “overseas permanently” (assumed here to have returned to country of origin). Exchange rates are in terms of foreign currency per Australian dollar. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and immigrant controls include age, sex, education level, household size, marital status, type of visa upon admission, state of residence, average weekly income in the earlier wave and Australian dollar value of funds arrived with when first immigrated. Robust standard errors in parentheses, clustered at the country of origin level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2.8: The Effect of Future Exchange Rate Shocks on Permanent Return Migration in the Prior Period

Panel A	Return from wave 1 - wave 2	Panel B	Return from wave 2 -3 wave 3
$\Delta \ln \text{ERATE}_{wave2-wave3}$	-0.0057 (0.0081)	$\Delta \ln \text{ERATE}_{wave3-2yrsafter}$	-0.0139 (0.0128)
Return Rate	0.02		0.04
Country of Origin controls	Y	Country of Origin controls	Y
Household controls	Y	Household controls	Y
Individual Migrant Controls	Y	Individual Migrant controls	Y
N	3535	N	3069
R^2	0.005	R^2	0.025

Notes: For panel A, the dependent variable is a dummy variable indicating that the individual is reported to be “overseas permanently” for wave 2 (assumed here to have returned to country of origin). The exchange rate change is the change in the exchange rate from wave 2 to wave 3 of the survey. For panel B, the dependent variable is a dummy variable indicating that the individual is reported to be “overseas permanently” for wave 3 (assumed here to have returned to country of origin). The sample size is naturally smaller for wave 2-3 migrants because some had already left the survey from a previous wave. The exchange rate change is the change in the exchange rate from wave 3 to two years after the survey. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and immigrant controls include age, sex, highest educational attainment, household size, marital status, type of visa upon admission, state of residence, average weekly income and Australian dollar value of funds arrived with when first immigrated.

Robust standard errors in parentheses, clustered at the country of origin level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2.9: Are the Effects of the Exchange Rate Shocks Contemporaneous?

	(1)	(2)	(3)	(4)	(5)
$\Delta \ln \text{ERATE}$	-0.0554* (0.0280)	-0.0557* (0.0284)	-0.0554* (0.0285)	-0.0565* (0.0284)	-0.0543* (0.0292)
$\Delta \ln \text{ERATElag1}$		0.0070 (0.0494)	0.0063 (0.0499)		
$\Delta \ln \text{ERATElag2}$			0.0057 (0.0239)		
$\Delta \ln \text{ERATElag10yr}$				0.0029 (0.0031)	
$\Delta \ln \text{ERATEfuture}$					0.0104 (0.0176)
Country of Origin controls	Y	Y	Y	Y	Y
Household controls	Y	Y	Y	Y	Y
Individual Migrant controls	Y	Y	Y	Y	Y
N	2596	2596	2596	2596	2596
R^2	0.024	0.024	0.024	0.024	0.024

Notes: The dependent variable is a dummy variable indicating that the individual is reported to be “overseas permanently” (assumed here to have returned to country of origin). Exchange rates are in terms of foreign currency per Australian dollar. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and migrant controls include age, sex, highest educational attainment, household size, marital status, type of visa upon admission, state of residence, average weekly income and Australian dollar value of funds arrived with when first immigrated. Robust standard errors in parentheses, clustered at the country of origin level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2.10: The Effect of Exchange Rate Shocks on Permanent Return Migration for the Trimmed Sample

	(1)	(2)	(3)	(4)	(5)	(6)
	Full	w/o top 3	w/o top 5	trim 99th	trim 95th	trim 90th
$\Delta \ln \text{ERATE}$	sample	extreme	extreme	percentile	percentile	percentile
	-0.0373***	-0.0513**	-0.0518**	-0.0437***	-0.0842***	-0.104**
	(0.0104)	(0.0207)	(0.0231)	(0.0130)	(0.0272)	(0.0414)
Country of Origin controls	Y	Y	Y	Y	Y	Y
Household controls	Y	Y	Y	Y	Y	Y
Individual Migrant controls	Y	Y	Y	Y	Y	Y
N	3069	2963	2948	3036	2915	2768
R^2	0.028	0.027	0.027	0.028	0.028	0.027

Notes: The dependent variable is a dummy variable indicating that the individual is reported to be “overseas permanently” (assumed here to have returned to country of origin). Exchange rates are in terms of foreign currency per Australian dollar. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and migrant controls include age, sex, education level, household size, marital status, type of visa upon admission, state of residence, average weekly income in the earlier wave and Australian dollar value of funds arrived with when first immigrated.

Robust standard errors in parentheses, clustered at the country of origin level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2.11: Expect to Emigrate to Another Country?

	Freq.	Percent
Yes	28	0.91
No	2699	87.94
Not Sure	213	6.94
[Expect to immigrate to former country]	129	4.20

Table 2.12: The Correlation Between the Attrition Variable and the Exchange Rate Shocks

	(1)	(2)	(3)	(4)	(5)	(6)
	Unable to Track	Refused	Overseas Temporarily	Out of Scope	Deceased	Other
$\Delta \ln \text{ERATE}$	0.0085 (0.0131)	0.0054 (0.0113)	-0.0117 (0.0170)	0.0078* (0.0047)	-0.0009 (0.0006)	0.0131 (0.0089)
Country of Origin controls	Y	Y	Y	Y	Y	Y
Household controls	Y	Y	Y	Y	Y	Y
Individual Migrant controls	Y	Y	Y	Y	Y	Y
N	3069	3069	3069	3069	3069	3069
R^2	0.022	0.002	0.013	0.000	0.007	0.007

Notes: Exchange rates are in terms of foreign currency per Australian dollar. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and immigrant controls include age, sex, education level, household size, marital status, type of visa upon admission, state of residence, average weekly income in the earlier wave and Australian dollar value of funds arrived with when first immigrated. Robust standard errors in parentheses, clustered at the country of origin level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

CHAPTER III

The International Migration of Healthcare Professionals and the Supply of Educated Individuals Left Behind

3.1 Introduction

Many consider brain drain, the migration of skilled professionals, as a chief concern for many developing countries. Policymakers worry that as receiving countries recruit workers from abroad, origin countries lose talent that their education systems paid to train. At the center of these concerns is the migration of healthcare professionals. As rich countries increasingly address workforce shortages by recruiting doctors and nurses from abroad, a popular view is that this hurts poor countries by causing a scarcity of healthcare professionals, leading to poor health outcomes in these places. The consequences are deemed so grave that in 2012, members of the WHO adopted a nonbinding *Global Code of Practice in the International Recruitment of Health Personnel* discouraging active recruitment from developing countries (Clemens 2013). Destination countries have responded by banning recruitment from certain developing countries.

Does international migration lead to the depletion of human capital in developing countries? The term “brain drain” implies that it should yet it is unclear if it does,

especially if prospects for international migration incentivize a lot of individuals to acquire education. In this chapter, we investigate the close link between international migration and human capital formation. We focus on nurse migration from the Philippines and exploit the aggressive recruitment policies conducted by the U.S., a major destination country, in the 2000s. During this period, the U.S. relaxed its immigration policy to allow a substantial number of nurses to work in the country on permanent resident visas. The majority of those who migrated were Filipino nurses. A concern then was that this migration would deplete the number of healthcare workers in the Philippines.

Despite this concern, however, data from the Philippine Commission on Higher Education (CHED) suggest the opposite outcome. In response to increased prospects of moving abroad, enrollment in nursing programs rose from 90,000 to over 400,000 from 2001 to 2006 (Figure 3.1). At the same time, the number of nursing graduates grew from 9000 to 70,000 (Figure 3.2). Hence, the migration of nurses may not have led to a drain on human resources, but to an increased supply of higher educated individuals remaining in the country.

We utilize unique administrative data on migrant departures from 2000 to 2012 to analyze the effect of nurse migration on education in the Philippines. We exploit spatial variation in nurse migration rates across provinces to measure the province's exposure to demand for migrant nurses from abroad.¹ Using a simple difference-in-differences framework, we estimate that an average year-to-year percent increase in nurse migration caused nursing enrollment to increase by 9.7% during the period. We show that this increase largely represented new human capital formation and cannot merely be accounted for by existing students shifting their discipline to nursing. In addition, we exploit the sudden exhaustion of visa availability in 2007 as a supplement

¹Provinces can experience different levels of demand for migrant workers, given the importance of migrant networks as a determinant of international migration (Munshi 2003; Theoharides 2014). As a result, when demand for nurse migrants change in destination countries, this will have a larger effect on the migration rate in provinces specializing in sending such migrants.

to our analysis. The event restricted nurse migration to the U.S. We find results that are consistent with the main finding: the restriction led to an 8% drop in nurse enrollment.

Our results are consistent with models of human capital formation where high prospective returns to skill in foreign countries lead to skill acquisition at home (Stark, Helmenstein and Prskawetz 1997 and Mountford 1997). Recent empirical work finds support for such models in countries like Nepal and Fiji. Shrestha (Forthcoming), for instance, argues that the recruitment of Nepalese men into the British Army raised educational attainment. Chand and Clemens (2008) exploit political shocks in Fiji to demonstrate that mass departures by Indo-Fijians subsequently led this group to invest more heavily in education. Doubts remain however as to whether the same might apply to a more prominent flow, the international migration of healthcare workers, since the supply of tertiary schooling may not respond as easily to the demand for education in a specialized but large occupation, as Docquier and Marfouk (2006) point out. We address these doubts in this chapter.

The results provide evidence against the usual refrain about brain drain: that when workers leave, their domestic numbers decrease, and it is difficult to replace them. We demonstrate why it might not be useful to think of the stock of healthcare workers in migrant-sending countries as a fixed quantity. At least in this case, supply responded to demand from employers abroad. Our findings lend support for well-designed partnerships between sending and receiving countries that can in principle facilitate both human capital accumulation and migration.

3.2 Background

3.2.1 The Philippines and Nurse Migration

With over 11% of its population living abroad, the Philippines is one of the largest migrant-sending countries in the world. It also happens to be the largest supplier of nurses in the world. Around 3000 to 8000 nurses leave the country each year – the most of any nation in the world. Figure 3.3 plots the departure of Filipino nurses from 2000 to 2012. Filipino nurses make up the single largest group of foreign-born nurses serving in OECD countries (OECD 2007).

If anywhere, this country is where we should expect to find a shortage of nurses. Indeed, policymakers suspected as much when nurse migration picked up in the early 2000s. “Sadly, this is no longer brain drain, but more appropriately, brain hemorrhage of our nurses,” said the former minister of health, Dr. Jaime Galvez-Tan. “Very soon, the Philippines will be bled dry of nurses (Asia Times 2003).”

While early theoretical work in economics tends to share a negative view of skilled migration², recent models question the notion that skilled-worker movement necessarily leads to a “loss” in countries of origin. Stark, Helmenstein and Prskawetz (1997) and Mountford (1997) provide models where a home country can end up with a higher stock of human capital even when high-skill members of its workforce migrate. These models highlight that (1) when there are substantially higher returns to human capital abroad than at home and (2) migration requires education (3) if the possibility of moving is uncertain, then migration may induce workers to acquire education, even if not all eventually move abroad. Thus, a net “gain” may occur if more end up investing in education than those who move away.

The Philippines is an excellent setting to test the relationship between the international migration of nurses and human capital formation. The setting fulfills

²See for example Gruber and Scott (1966) or Bhagwati and Hamada (1974).

conditions described by the aforementioned “brain gain” models. First, there are huge returns for nurses to migrate abroad from the Philippines. In 2008, for example, the median annual salary for a nurse was equivalent to \$1,813 per year in the country; while in the same year, it was \$62,450 in the U.S. (Arends-Kuenning, Calara and Go 2015). Second, nurse migration requires significant investment in education. It takes a minimum of four years to obtain a nursing degree from the Philippines and this is generally a requirement to obtain a nursing license abroad (Engman 2010). Third, migration is highly uncertain. Especially in the period we consider from 2000 to 2012, the recruitment policy conducted by the U.S. was an important determinant. But the rules kept changing, and the flow was suddenly restricted in 2007 as we describe below.

3.2.2 Nurse Migration to the U.S. in the 2000s

The U.S. is the preferred destination of Filipino migrant nurses. Nurse departures to the country are a major driver of the migrant flow between 2000-2012 (Figure 3.3). During this period, 76% of migrant nurses went to the U.S. This corresponds to survey results from Van Eyck (2004), which reveal that more than four-fifths of Filipino nurses prefer a job in the U.S.

The most common channel for foreign nurses to enter the U.S. market is through permanent employment-based visas (EB-3 visas). Opportunities to migrate under temporary work permits for nurses are generally limited (DHS 2008). U.S. immigration law provides 140,000 employment-based visas annually to principals in addition to their spouses and children (Jasso et al. 2010). Visas for first and second preference workers (persons with extraordinary ability and professionals holding advanced degrees) are first processed, then a portion of the 140,000 is allocated to EB-3 visas. The advantage of nurses is that they typically enjoy a shorter processing time frame for their visas. The U.S. Department of Labor designates nurse as an occupation

under “Schedule A.” Schedule A are occupations under which there is a shortage of U.S. workers who are able, willing, qualified, and available.

It is by no means, however, easy to migrate to the U.S. as a nurse from the Philippines. First, visas are usually unavailable. Immigration rules stipulate that individuals born in any given country may not be allocated more than 7 percent of the total number of immigrant visas per fiscal year. Since visa applications from the Philippines far exceed the 7 percent per-country limit, waiting times span years. Second, those wishing to migrate as a nurse must pass a battery of tests (Aiken 2007). All nurses take the National Council Licensure Examination (NCLEX) to practice as a registered nurse in the U.S. Applicants need to demonstrate that their education was at the postsecondary level. Moreover, foreign trained nurses must pass an english proficiency test, the Test of English as a Foreign Language (TOEFL).

Several changes in U.S. immigration policy facilitated nurse migration from the Philippines in the 2000s. The American Competitiveness in the 21st Century Act of 2000 (AC21) modified the existing law to loosen per country limits on visa allocations. AC21 excused per country limits when such would result in part of the 140,000 employment-based visas to remain unused. This immediately benefitted oversubscribed countries like China, Mexico, India, and the Philippines. The rule change cut down on waiting times and allowed visas to be issued immediately to individuals from these places. Further, AC21 recaptured 130,137 visas, which had been unused in 1999 - 2000, and made them available to employment-based visa applications (Jasso et al. 2010). In 2005, the Real ID Act made 50,000 unused visas from 2001 - 2004 available, allocating them to Schedule A occupations. The U.S. also decided to issue permanent visas to children and spouses of nurses without delay (Engman 2010). These policies explain the rise of nurse migration from the Philippines from 2000 to 2006 in Figure 3.3. It was an exceptional period, where there were minimal wait times for a visa.

Then, in February 2007, the period of easy migration of nurses to the U.S. suddenly

came to an end. Processing of Schedule A visas stopped. Unused visa numbers were completely exhausted. Visa Bulletins from the U.S. Citizenship and Services (USCIS) stopped listing Schedule A as a separate visa category. As a result, in 2006, there were 5,290 employer-sponsored visas for nurses that were processed from the Philippines; in 2007, this dropped to 815 and has continued to be low.³ Other migration streams to the U.S. did not seem affected (Figure 3.3).

We exploit this sudden change in visa availability for nurses in our analysis to look at the effect of this restriction on migration and education. We argue that the change was plausibly exogenous. That chances to migrate to the U.S. would abruptly drop in February 2007 would have been difficult to predict for individuals intending to migrate from the Philippines. U.S. immigration rules are so complex that the number of people in queue for permanent visas is often difficult to ascertain, as Jasso et al. 2010 contend, even in fact by officers handling such petitions. As the USCIS Ombudsman (2007) reported to Congress in an annual report: “Exactly how many employment-based green card applications does the agency have pending? USCIS still cannot answer that question today with certainty.”

3.3 Data

We utilize unique administrative data on migrant departures from the Philippines from 2000 to 2012. The data are from the Commission on Filipinos Overseas (CFO), a government agency responsible for registering emigrants and strengthening the ties of the diaspora with the homeland. All emigrants who plan to move abroad on a permanent immigrant visa are required to register with the CFO before leaving.⁴

³The uptick in nurse migration from 2009 onwards in Figure 3.3 is due to Canada, not the U.S.

⁴Thus, the CFO data, combined with data from the Philippine Overseas Employment Administration (POEA), which maintains a database of all Filipinos who leave abroad for temporary contract work, captures the universe of legal migrant departures. Theoharides (2014) uses the latter dataset to analyze the effect of labor force migration on secondary school enrollment in the Philippines. For the purpose of this chapter, we focus only on data from the CFO since there are challenges with merging these with the POEA data that are difficult to overcome at present.

The CFO data contain rich information on every individual who has emigrated on a permanent visa. The data include demographic information as well as information on place of birth, usual address, country of destination, education, course of study, and profession, among other things. To our knowledge, this is the first dataset of its kind. We are able to accurately measure skilled migration and track the outflow of all nurses.

The use of administrative data to analyze high-skill migration already represents an improvement in understanding the effect of migration. Past studies typically rely on changes in the stock of educated individuals living abroad to estimate skilled migration from a country. But such calculations overstate “brain drain” from a country if many individuals acquire education *after* they migrate. Ozden and Phillips (2015), for example, show that almost half of African-born doctors were trained outside of their birth country.

We calculate province-level migration rates for nurses and the rest of the migrant population using the CFO dataset. To do this, we aggregate departures in each province-year and divide by the working aged (18-60) population in each province in the year 2000. We define nurses as those who have obtained a nursing degree or whose usual work is as a professional nurse. Panel 1 of Table 3.1 presents summary statistics. The average province-level migration rate is 0.091% while the nurse migration rate is 0.008% of the working aged population.

We obtained administrative data on tertiary enrollment and graduation from 2000 to 2012 from the Commission on Higher Education (CHED). The data include school-level information on the number of enrollees and graduates in an academic year, as well as numbers disaggregated by program of study. Thus, to complement our data on migration, we have information on all enrollments and graduations in the various disciplines around the country.

We aggregate numbers at the province-level and calculate rates of enrollment

and graduation for nurses and the other disciplines by dividing by the college-aged population (18-21) in each province. Panels B and C in Table 3.1 present the summary statistics. The average school enrollment rate is 38%, while the rate of enrollment in nursing programs represent 3% of the college-aged population. The average total and nurse graduation rates in an academic year are 6% and 0.7% respectively.

3.4 Empirical Strategy

To get at preliminary estimates of the effect of nurse migration on education, we implement a difference-in-differences framework, exploiting geographic variation in nurse migration rates from 2000 to 2012. We estimate the following basic regression equation:

$$Y_{pt} = \beta_0 + \beta_1 \text{Migrate}_{pt-1} + \alpha_p + \gamma_t + \alpha_p t + \varepsilon_{pt} \quad (3.1)$$

where Y_{pt} is the enrollment or graduation rate for a nursing degree in province p in year t in the Philippines, and α_p and γ_t account for province and year fixed effects. Migrate_{pt-1} is the fraction of nurse migrants out of the total working age population who departed for abroad from province p in year $t - 1$.⁵ We also include provincial-specific linear time trends, $\alpha_p t$. The coefficient of interest is β_1 which gives the effect of nurse migration on human capital accumulation, given a number of identifying assumptions. We estimate equation 3.1 using OLS and cluster standard errors at the province level. We look at the effect of nurse migration on total college enrollment and graduation, and separately by gender.

Two primary issues challenge the interpretation of β_1 as a causal effect: reverse causation and omitted variables. First, high provincial enrollment into nursing may cause nurse migration, rather than the other way around. For example, firms abroad

⁵Since the school year starts in June in the Philippines, the relevant migration rate to consider in making decisions to enroll in school is the past year's migration rate ($t - 1$).

might recruit workers from provinces that produce a large number of nurses in the first place. Second, omitted factors, such as economic growth in provinces, could drive both high enrollment and migration. To the extent that such omitted variables like economic growth vary over time in provinces, province fixed effects insufficiently addresses the bias that may arise from these (although including province-specific linear time trends, α_{pt} , alleviates part of the problem). Both issues lead to overestimating the effect of migration on education.

We implement an alternative empirical strategy as a supplement to our analysis to further estimate the causal effect. We exploit the exogenous policy change that occurred starting February 2007 that restricted nurse migration to the U.S. As described earlier, the rule change was sudden and severely limited the option of many Filipino nurses and their families to migrate to the U.S. Provincial nursing enrollments in the Philippines could not have plausibly caused this restriction. Hence, this strategy allows for an alternate way of estimating the effect of nurse migration on education in a way that accounts for some of the concerns listed above.

We exploit the fact that provinces that usually have a larger flow of nurse migrants as a portion of their population experienced a larger reduction in migration as a result of the rule change compared to provinces that usually have a smaller flow of nurse migrants. The larger the flow of nurse migrants prior to the rule change, the larger the treatment dosage a province receives (the effect of the policy change in the province).

Formally, we estimate the following equation:

$$Y_{pt} = \beta_0 + \beta_1(POST * Migrate_{p,baseyear}) + \alpha_p + \gamma_t + \varepsilon_{pt} \quad (3.2)$$

where $POST$ is a dummy variable equal to 1 in years 2007 onwards and equal to 0 in years prior. $Migrate_{p,baseyear}$ is the migration rate of nurses in province p for a base year. We define either 2000 or 2001 as the base year. α_p and γ_t are province

and year fixed effects while ε_{pt} is an error term, which we clustered at the province level. β_1 estimates the effect of the policy change for provinces with different baseline flows of nurse migrants. We estimate the effect of the change on migration rates and educational outcomes, Y_{pt} . We estimate equation 3.2 primarily for 2004 to 2009 but also verify that the results are robust when using a longer time frame.

Parallel trends in outcomes for provinces prior to the policy change need to hold in order for β_1 to be interpreted as a causal effect. In other words, outcomes in provinces with high nurse migration rates in the base year (“treatment provinces”) should follow the same trend as outcomes in other provinces (“control provinces”) in the absence of the 2007 policy change.

We test for this assumption by plotting the average nurse migration and enrollment rates by quartile of the baseline nurse migration rate in 2000. We show these for years prior to the 2007 policy change. Figures 3.4 and 3.5 plot the results. Nurse migration trends appear parallel for years prior to 2007, but do not seem parallel for nurse enrollment rates. Enrollment rates increased faster in provinces with already high enrollment rates at the baseline year. This trend biases our estimates in a favorable way. In particular, our estimates of β_1 will underestimate the true negative effect of the restriction suddenly imposed by the U.S since enrollment rates were trending up faster for provinces with higher nurse migration rates at baseline.

3.5 Results

3.5.1 Results from the Basic Difference-in-difference

Table 3.2 provides our estimates of equation 3.1, the effect of nurse migration on tertiary school enrollment and graduation in Philippine provinces. We first look at the effect on nurse enrollment in Panel A. We find a strong and positive relationship between nurse migration and enrollment in nursing programs. A one percentage point

increase in the nurse migration rate is associated with 124 percentage points increase in nurse enrollment.

The estimate might seem like an unrealistic effect, but it is worth scaling results because the average nurse migration rate in provinces is low at 0.008% and an increase of one percentage point is unlikely. To scale results, we calculate the year-to-year change in nurse migration to be 0.003 percentage points in the data. Thus, for a reasonable change of 0.003 percentage points in migration, our results imply that enrollment increases by 0.37 percentage points ($= 0.003 * 124.03$). This represents a 9.7% increase in enrollment out of an average enrollment of 3.81% in nursing programs. The positive effect holds for both males and females (columns 2 and 3). Male and female enrollment in nursing programs increased by 9% and 12% respectively.

The increase in enrollment in nursing programs can theoretically be driven either by new enrollment or by students merely shifting disciplines in tertiary school. The latter does not necessarily represent new human capital accumulation so it is important to verify whether additional enrollment arises simply from students changing disciplines. One way to empirically check is to look at whether nurse migration decreases enrollment in other disciplines. Panel B of Table 3.2 presents regressions looking at such an effect. While the point estimates show a negative effect, we cannot statistically reject that the effect is zero. The estimated magnitudes too, although not precisely estimated, cannot account for the full increase in enrollments in nursing. It does seem that the increase in nurse enrollments induced new enrollments rather than just a change in disciplines by students who would have enrolled in tertiary school regardless.

Panel C in Table 3.2 shows that nurse migration statistically had no effect on graduation rates in nursing and other disciplines. This may however simply mask lags in the effect of nurse migration. Graduating in college, after all, takes 4 years. To further investigate in Table 3.3, we present results regressing nurse enrollment and

graduation rates on lagged nurse migration up to 4 years prior to the present period. We find that nurse migration is associated with increased enrollment and graduation into nursing but mostly 3 to 4 years down the line. This is consistent with education being a long investment and effects taking time to manifest.

Further, we consider the effects of nurse migration, accounting for birth provinces. A concern with our previous analysis is that it does not account for internal migration. In reality, however, individuals from rural areas might move to populated cities first, where migration is common, before migrating abroad. This could bias our result in the following way. If the investment in education occurs in birth provinces rather than provinces of departure, then our previous estimates could underestimate the effect of nurse migration since the education investment response is in a different location. In order to alleviate this concern, we estimate our main regressions in Table 3.4 again, but make use of nurse migration from birth provinces (rather than provinces of departure) and look at its effect on education decisions in the birth provinces (again, rather than in provinces of departure). While the effect on nurse enrollment no longer is statistically significant, the magnitude of the estimated effects is similar to those found in Table 3.2.

Robustness checks of our results are displayed in Table 3.5. We replicate our main result in column 1. In column 2, we drop the highest migration province in our analysis in estimating our effect. Column 3 includes the migration rate of other occupations aside from nursing as a control, to proxy for third factors that may cause a general increase in both migration and enrollment in provinces. Column 4 conducts the analysis by broadening the definition of which individuals are nurses in our sample. As mentioned in the data section, we count individuals as nurses if they obtained a nursing degree, or if their usual work is as a nurse. But health workers in general may also migrate as nurses, while the response to nurse migration may also be through enrolling in health-related, but not nursing, degree programs. We look at the

relationship of health worker migration and enrollment in a health-related discipline in the last column. Our results are not sensitive to any of these robustness checks.⁶

3.5.2 Results from Exploiting the 2007 Policy Change

Our main results stand even when taking advantage of the sudden exhaustion of visa availability in 2007 as a source of exogenous variation. In Table 3.6, we estimate the effect of the rule change on nurse migration and consequently nurse enrollment.

Using 2000 as the baseline year, we find that a one percentage point increase in the nurse migration rate at baseline led the policy to reduce nurse migration by 0.83 percentage points (column 1). Since the average year-to-year change in the nurse migration rate during period was 0.003 percentage points, the policy in effect reduced nurse migration by $0.0025(0.003 * .83)$ percentage points. Since the average migration rate in the period was 0.008%, the effect represents a 31% decrease in nurse migration.⁷

Meanwhile, the policy also led to a subsequent decrease in enrollments in nursing. Following the usual calculations using the year-to-year change in the nurse migration rate, we estimate the the policy change led to an 8% decrease in enrollments for nursing given that average enrollment during the period was 5.34%.

The effect sizes are only slightly smaller when using 2002 as the base year in columns 3 and 4 of the same table. Appendix Table C.2 performs a robustness check by estimating the effect of the policy change using a longer time frame in the data (2004-2012, instead of 2004-2009). The effects of restricting nurse migration in 2007 are estimated to be larger in this sample, presumably because the effect on enrollment grows larger over time.

⁶Furthermore, Appendix Table C.1 reproduces regressions from Table 3.2, excluding province-specific time trends from the specification. This does not change results much, except make the effects for graduation to be positive.

⁷It is important to keep in mind that the exhaustion of visa availability in 2007 did not halt all nurse migration because in practice nurses may still migrate to other countries or to the U.S. through other visa streams if, for example, they were petitioned by family and not by an employer.

3.6 Discussion

The rise in the emigration of health professionals from developing countries raises concerns that countries are necessarily drained of an essential human resource. In this chapter, we raise questions about the inevitability of this concern by demonstrating how skilled migration might induce human capital formation to the extent that it offsets the loss from international migration. We focus on the case of Filipino nurse migration from 2000-2012, when the U.S. aggressively recruited Filipino nurses, causing alarm to policymakers. We find that in response, Filipinos educated themselves in large numbers. Our results suggest that an average year-to-year increase in nurse migration led to a 9.7% increase in nurse enrollment during this period. Our results are consistent with models that illustrate the possibility of high-skilled emigration giving rise to higher levels of human capital in the home country because decisions about education may be endogenous to movement.

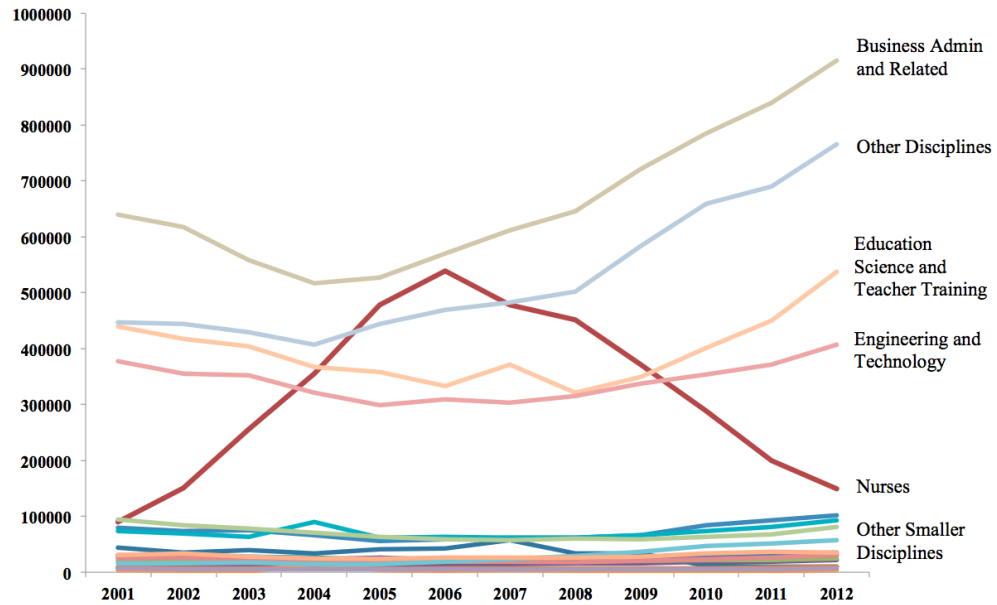
We make no claims however that what happened in the Philippines must apply everywhere else. In a way, the Philippines is a unique setting because of its history as a migrant-sending country. Nevertheless, we show that common assumptions about skilled migration need not apply in a setting where there is a huge volume of departures and people largely expect a “drain” to occur. The supply of nurses responded and accommodated demand from abroad.

Part of the reason many individuals were able to get nursing education during the period was because schools were rapidly able to accommodate increased demand from students to become nurses. The number of nursing programs around the country went from 435 in 2001 to 880 in 2010. In future work, we plan to further investigate this channel by looking at the effect of international migration not just on households, but also on the supply side of education: the creation of schools and other institutions supportive of human capital accumulation. International migration may also have an effect on the quality, not just quantity, of schools. This is a topic for which very little

is known and an understanding is crucial in determining why migration may lead to human capital accumulation not just in the Philippines but in other settings as well.

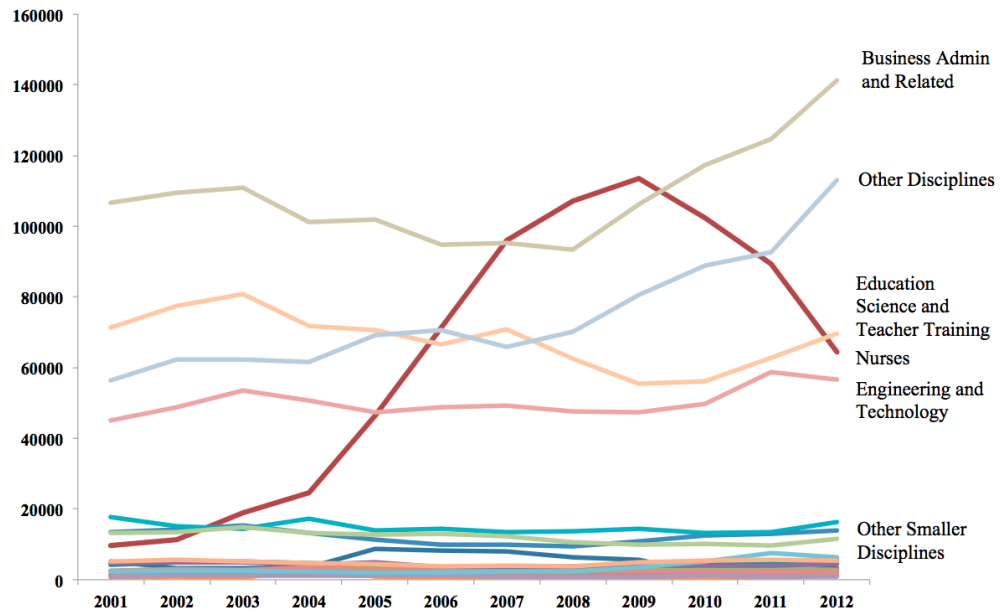
Our results provide support for well-designed partnerships regarding healthcare workers between receiving and sending countries. The cost of training nurses at migrant-sending countries is often a small fraction of the cost of training nurses at receiving countries, whereas nursing services are worth much more in receiving countries, at least in terms of pay (Clemens 2015). A well-designed partnership can, at least in principle, present a win-win situation by allowing receiving countries to subsidize training for workers in sending countries while facilitating the migration of some skilled workers.

Figure 3.1: Enrollment in Tertiary Education (2001-2012) By Discipline



Source: CHED and authors' calculations

Figure 3.2: Graduation in Tertiary Education (2001-2012) By Discipline



Source: CHED and authors' calculations

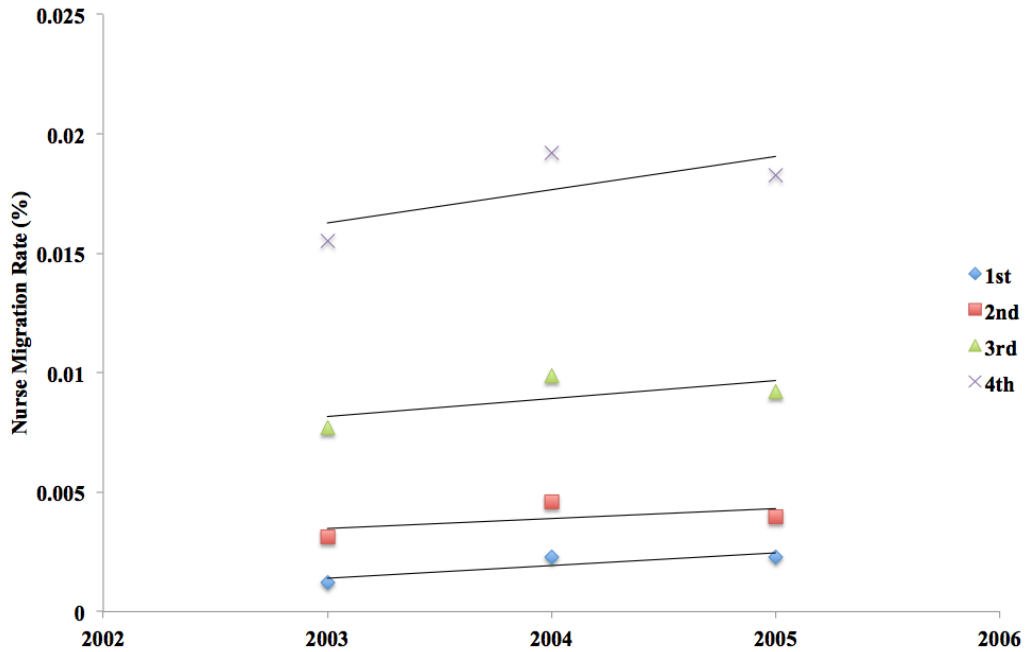
Figure 3.3: Number of Departures of Nurse and Other Migrants (2000-2012)



Notes: The red line shows the total for nurse migrants (left vertical axis) while the blue dotted line shows the total for other migrants (right vertical axis).

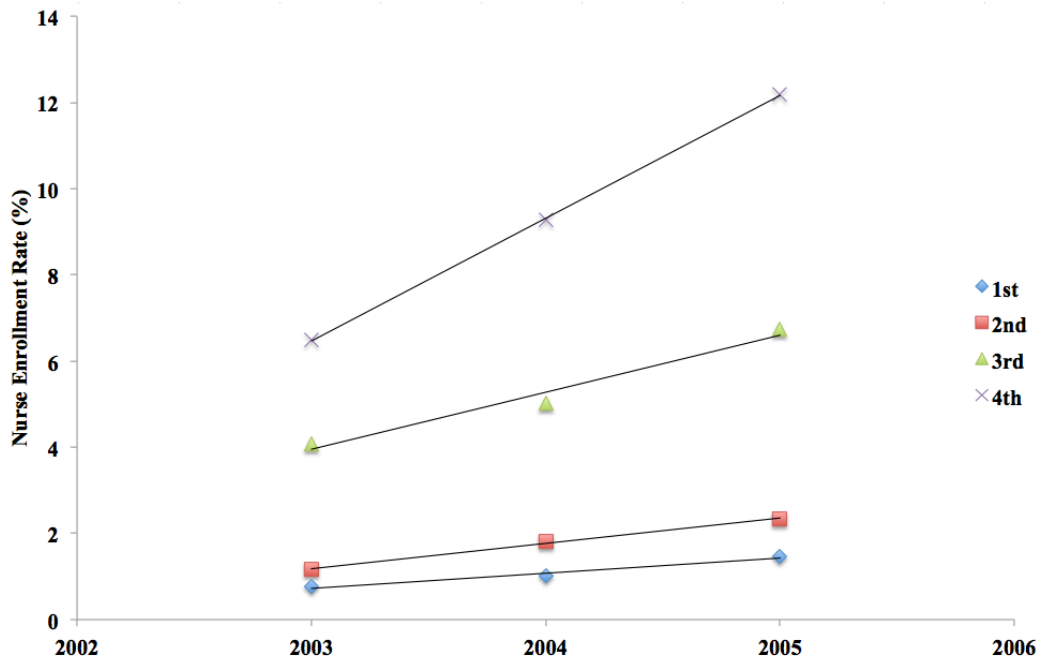
Source: CFO and authors' calculations.

Figure 3.4: Pre-trends in the Nurse Migration Rate Across Provinces by Base Share Quartile



Notes: The migration rate is the average province level nurse migration rate per quartile.
 Source: CHED, CFO, and authors' calculations.

Figure 3.5: Pre-trends in the Nurse Enrollment Rate Across Provinces by Base Share Quartile



Notes: The enrollment rate is the average province level nurse enrollment rate per quartile.
 Source: CHED, CFO, and authors' calculations.

Table 3.1: Descriptive Statistics

	Mean	SD	Min	Max
Panel A:				
Migration Rates (%)				
Total Migration Rate	0.091	0.099	0	0.777
Nurse Migration Rate	0.008	0.009	0	0.076
Other Migration Rate	0.083	0.092	0	0.720
Panel B:				
School Enrollment Rates (%)				
Total	38.566	30.438	1.456	259.043
Total Nurse	3.811	6.053	0	59.347
Female Nurse	2.666	4.127	0	40.771
Male Nurse	1.145	1.943	0	18.577
Total Other	34.755	26.458	1.456	246.958
Female Other	18.635	13.679	0.710	135.301
Male Other	16.119	12.996	0.721	116.532
Panel C:				
School Graduation Rates (%)				
Total	6.296	5.210	0.023	57.363
Total Nurse	0.746	1.239	0	11.760
Female Nurse	0.526	0.862	0	8.516
Male Nurse	0.220	0.393	0	3.244
Total Other	5.550	4.458	0.023	57.363
Female Other	3.146	2.469	0.019	37.303
Male Other	2.404	2.101	0.003	20.903

Notes: The sample period is from 2000 to 2012 while the unit of observation is the province-year. Data from 80 Philippine provinces are used. Values are expressed as percentages. Enrollment and graduation rates are calculated using the population aged 18-21 as the denominator, while the migration rate uses the working aged population (18-60) as the denominator. $N = 960$.

Sources: CHED, CFO, and authors' calculations.

Table 3.2: Effect of Nurse Migration on Tertiary School Enrollment and Graduation Rates

	Enrollment (Females & Males) (1)	Enrollment (Female Only) (2)	Enrollment (Males Only) (3)
Panel A. Effect on Nurse Enrollment	124.03* (67.05)	79.03* (42.76)	44.99* (24.56)
R^2	0.83	0.84	0.80
Mean Dependent Variable	3.81	2.67	1.14
Panel B. Effect on Other Enrollment	-51.57 (84.72)	-55.05 (72.40)	3.47 (23.44)
R^2	0.97	0.95	0.98
Mean Dependent Variable	34.76	18.64	16.12
	Graduation (Females & Males) (1)	Graduation (Female Only) (2)	Graduation (Males Only) (3)
Panel C. Effect on Nurse Graduation	-4.46 (15.38)	-0.38 (11.11)	-4.08 (4.38)
R^2	0.83	0.83	0.79
Mean Dependent Variable	0.75	0.53	0.22
Panel D. Effect on Other Graduation	16.88 (14.51)	1.75 (13.42)	15.13 (10.47)
R^2	0.84	0.79	0.88
Mean Dependent Variable	5.44	3.15	2.40
N	960	960	960
Mean Year-to-Year Change in the Nurse Migration Rate	0.003	0.003	0.003

Notes: Table 3.2 presents regressions of the nurse migration rate on enrollment and graduation rates. The sample period is from 2000 to 2012 while the unit of observation is the province-year. All regressions include province and year fixed effects in addition to province-specific linear time trends. Robust standard errors are clustered at the province level in parenthesis. The year-to-year change in the nurse migration rate is measured in percentage points. The nurse migration rates used are lagged by 1 year. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Sources: CHED, CFO, and authors' calculations.

Table 3.3: The Lagged Effect of Nurse Migration on Tertiary Enrollment and Graduation Rates

	Total Nursing Enrollment (1)	Total Nursing Graduation (2)
Nurse Migration Rate (Year-1)	50.64 (32.34)	4.81 (14.75)
Nurse Migration Rate (Year-2)	52.33 (32.44)	9.90 (14.05)
Nurse Migration Rate (Year-3)	154.16*** (40.60)	42.74** (19.44)
Nurse Migration Rate (Year-4)	201.68*** (68.09)	52.23*** (15.62)
N	720	720
R ²	0.97	0.87

Notes: The sample period is from 2000 to 2012 while the unit of observation is the province-year. All regressions include province and year fixed effects in addition to province-specific linear time trends. Robust standard errors are clustered at the province level in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Sources: CHED, CFO, and authors' calculations.

Table 3.4: Effect of Nurse Migration on Tertiary School Enrollment and Graduation Rates (in birth province)

	Enrollment (Females & Males) (1)	Enrollment (Female Only) (2)	Enrollment (Males Only) (3)
Panel A. Effect on Nurse Enrollment	104.48 (67.85)	68.07 (43.11)	36.42 (24.90)
R^2	0.83	0.84	0.80
Mean Dependent Variable	3.81	2.67	1.14
Panel B. Effect on Other Enrollment	-101.82 (78.56)	-91.94 (64.49)	-9.88 (23.83)
R^2	0.97	0.95	0.98
Mean Dependent Variable	34.76	18.64	16.12
	Graduation (Females & Males) (1)	Graduation (Female Only) (2)	Graduation (Males Only) (3)
Panel C. Effect on Nurse Graduation	2.25 (16.44)	4.88 (12.30)	-2.64 (4.28)
R^2	0.83	0.83	0.79
Mean Dependent Variable	0.75	0.53	0.22
Panel D. Effect on Other Graduation	23.41 (14.80)	6.58 (15.66)	16.83 (10.63)
R^2	0.84	0.79	0.88
Mean Dependent Variable	5.44	3.15	2.40
N	960	960	960
Mean Year-to-Year Change in the Nurse Migration Rate	0.004	0.004	0.004

Notes: Table 3.4 presents regressions of the nurse migration rate on enrollment and graduation rates in the birth province. The sample period is from 2000 to 2012 while the unit of observation is the province-year. All regressions include province and year fixed effects in addition to province-specific linear time trends. Robust standard errors are clustered at the province level in parenthesis. The year-to-year change in the nurse migration rate is measured in percentage points. The nurse migration rates used are lagged by 1 year. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Sources: CHED, CFO, and authors' calculations.

Table 3.5: Robustness Checks for the Effect of Nurse Migration on Tertiary School Enrollment

	Main Results			
	(1)	(2)	(3)	(4)
		Without Highest Migration Province	Controlling for Other Migration	Broader Definition of Nurse
Nurse Migration Rate	124.03* (67.05)	122.63* (70.91)	124.20* (64.41)	
Other Migration Rate			-0.13 (11.50)	
Health Worker Migration Rate				106.73* (62.00)
N	960	948	960	960
R ²	0.83	0.82	0.83	0.83

Notes: Table 3.5 presents robustness checks for the effect of migration on enrollment rates. The sample period is from 2000 to 2012 while the unit of observation is the province-year. All regressions include province and year fixed effects in addition to province-specific linear time trends. Robust standard errors are clustered at the province level in parenthesis. The migration rates used are lagged by 1 year. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Sources: CHED, CFO, and authors' calculations.

Table 3.6: The Effect of the 2007 Policy on Nurse Migration Rates and Enrollment

	Nurse Migration (1)	Nurse Enrollment (2)	Nurse Migration (3)	Nurse Enrollment (4)
POST*PreNurseMigrationRate2000	-0.83*** (0.19)	-146.95* (87.27)		
POST*PreNurseMigrationRate2001			-0.66*** (0.09)	-129.65** (58.58)
N	480	480	480	480
R ²	0.89	0.96	0.90	0.96
Mean of Dependent Variable	0.008	5.34	0.008	5.34

Notes: Table 3.6 presents estimates of the effect of the abrupt change in visa availability in 2007 on nurse migration and nurse enrollment. Columns (1) and (2) use 2000 as the base year while columns (3) and (4) use 2001. The sample period is from 2004 to 2009 while the unit of observation is the province-year. Robust standard errors are clustered at the province level in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Sources: CHED, CFO, and authors' calculations.

APPENDICES

APPENDIX A

Chapter 1 Appendices

Table A.1: List of Colleges and Universities

For High Quality Resumes: Top 4 Schools

Ateneo de Manila University	University of Santo Tomas
University of the Philippines	De La Salle University

The Rest

Abe International Business College	Pamantasan ng Lungsod ng Pasay
Adamson University	Pamantasan ng Lungsod ng Pasig
Ama Computer College	Pamantasan ng Lungsod ng Maynila
Ama Computer University	Perpetual Help College of Manila
Arellano University	Philippine Christian University
Asia Pacific College	Philippine Normal University
Asian College of Science and Technology	Philippine School of Business Administration
Central Colleges of The Philippines	Polytechnic University
Centro Escolar University	Rizal Technological University
Colegio de San Juan de Letran	Saint Joseph's College of Quezon City
College of Saint Benilde	San Beda College
College of The Holy Spirit	San Pablo Colleges
Concordia College	San Sebastian College
Dr. Filemon C. Aguilar Memorial College	St. Joseph's College of Quezon City
Emilio Aguinaldo College	St. James College of Quezon City
Eulogio Amang Rodriguez Institute of Science and Technology	St. Paul College
FEATI University	Systems Plus College Foundation
Far Eastern University	Systems Technology Institute
Holy Angel University	Taguig City University
Informatics Computer Institute	Technological Institute
Informatics International College	Technological University
International Electronics and Technical Institute	Trinity University of Asia
Jose Rizal University	Universidad de Manila
La Consolacion University	University of Caloocan City
Letran College	University of Makati
Lyceum of The Philippines University	University of Perpetual Help
Manila Central University	University of San Carlos
Manuel L. Quezon University	University of The East
Mapua Institute of Technology	University of Manila
National College of Business and Arts	University of Perpetual Help
National University	University of the East
New Era University	
Our Lady of Fatima University	

Notes: The top 4 universities in the Philippines (Ateneo, La Salle, UP, and UST) are considered as elite schools in the country. They are more commonly known as “The Big Four.” The four are the only schools to consistently rank among the top 800 in the QS World University Rankings.

Table A.2: Robustness Check of the Effect of Foreign Experience on Callback Rates

	(1)	(2)	(3)	(4)	(5)
	Callback	Callback	Callback	Callback	Callback
	OLS w/ FE	Probit	Main only	Only 1st job ad	Middle East & Construction
Has Foreign Experience=1	-0.0280*** (0.0071)	-0.0280*** (0.0101)	-0.0278*** (0.0074)	-0.0335*** (0.0099)	-0.0621*** (0.0265)
Controls	Y	Y	Y	Y	Y
Fixed Effects for Job ad	Y	N	Y	Y	Y
N	7,474	7,474	6,866	3,746	916
R ²	0.639	0.006	0.639	0.641	0.745

Notes: The table presents robustness checks for regressions of callback on foreign work experience. Robust standard errors, clustered at the resume level, are in parentheses. The probit coefficient reports an average derivative. The probit specification does not include fixed effects for job ad because of the incidental parameters problem, and many observations are dropped otherwise. Regressions include a constant term. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.3: The Effects of Foreign Experience on Callback Rates, By Each Year Spent Abroad

	(1) Callback
1 Year Abroad	-0.0098 (0.0197)
2 Years Abroad	-0.0272 (0.0202)
3 Years Abroad	-0.0122 (0.0181)
4 Years Abroad	-0.0227 (0.0196)
5 Years Abroad	-0.0381* (0.0195)
6 Years Abroad	-0.0284* (0.0172)
7 Years Abroad	0.0146 (0.0174)
8 Years Abroad	-0.0454** (0.0202)
9 Years Abroad	-0.0310* (0.0186)
10 Years Abroad	-0.0790*** (0.0185)
Mean Callback	0.24
Controls	Y
Fixed Effects for Job ad	Y
N	7,474
R^2	0.640

Notes: The table presents estimates of the effect of each separate year of foreign experience on callback rates, with the omitted category being the group of resumes with no foreign experience. Robust standard errors, clustered at the resume level, are in parentheses. Regressions include a constant term. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.4: A Tabulation of Recruiter Responses to the Interview

Recruiter responses before the experiment was revealed	
<i>We prefer returning migrant workers because?</i>	
They are familiar with unique procedures, techniques; foreign exposure is good	4
They have better communication skills (e.g. can interact with foreign clients well)	2
No particular reason	1
<i>We do not prefer returning migrant workers because?</i>	
They usually have high expected salaries/demands	15
The local candidate has better knowledge of business, law, culture in the Philippines	3
The local talent pool is already abundant	2
They are usually overqualified	1
They will most likely go abroad again soon	0
<i>It depends on various factors: skills, position, etc.</i>	
	11

Recruiter responses after the experiment was revealed

The lower callback rate for workers with foreign work experience is probably because?

- They usually have high expected salaries/demands 9
- The local candidate has better knowledge of business, law, culture in the Philippines 8
- The local talent pool is already abundant 0
- They are usually overqualified 0
- They will most likely go abroad again soon 6

I have no idea why the results are that way; in my experience we prefer foreign experience 1

No reply/nothing to add 10

Notes: The tabulation adds 1 for each mention of a particular answer. As such, a limitation of this tabulation is that it counts each answer with equal weight; it doesn't capture which explanations recruiters emphasized or highlighted. Because some respondents had multiple answers, the tabulation does not add up to the total number of respondents. Whenever respondents said, "It depends on various factors?" they usually explained that foreign work experience is more valuable for higher management positions, or for those positions that interact frequently with foreign clients. Otherwise, they said that they do not give any preference to where work experience was obtained. As shown, some respondents had nothing else to add, or did not reply, after the first set of questions.

APPENDIX B

Chapter 2 Appendices

A. Comparative Statics for the Optimization of the Life-cycle Migrant

The optimization problem can be reduced to:

$$\begin{aligned} \max_{c_f, c_h, t} \quad & t u_f(c_f) + (1 - t) u_h(c_h) \text{ such that} \\ & t E c_f + (1 - t) c_h = t E w_f + (1 - t) w_h \end{aligned} \quad (\text{B.1})$$

The first order conditions of the Lagrangian are provided by the following equations:

$$u_f(c_f) - u_h(c_h) + \lambda(Ew_f - w_h + c_h - Ec_f) = 0 \quad (\text{B.2})$$

$$u'_f(c_f) = E\lambda \quad (\text{B.3})$$

$$u'_h(c_h) = \lambda \quad (\text{B.4})$$

$$-t(Ew_f - w_h + c_h - Ec_f) + c_h - w_h = 0 \quad (\text{B.5})$$

Taking the total derivatives of B.2 and B.5 yields

$$(Ew_f - w_h + c_h - Ec_f)d\lambda = -E\lambda dw_f + \lambda dw_h - \lambda(w_f - c_f)dE \quad (\text{B.6})$$

$$\begin{aligned} & (Ew_f - w_h + c_h - Ec_f)dt \\ &= \left[-tE \frac{\partial c_f}{\partial \lambda} - (1-t) \frac{\partial c_h}{\partial \lambda} \right] d\lambda + tE dw_f + (1-t)dw_h + t \left(w_f - c_f - E \frac{\partial c_f}{\partial E} \right) dE \end{aligned} \quad (\text{B.7})$$

Define $a = -(Ew_f - w_h + c_h - Ec_f)$ and $b = tE \frac{\partial c_f}{\partial \lambda} + (1-t) \frac{\partial c_h}{\partial \lambda}$. Then if we let $dw_f = dw_h = 0$ and substitute B.6 into B.7, the resulting equation is

$$\frac{dt}{dE} = \frac{-b\lambda(w_f - c_f)}{a^2} + \frac{at(w_f - c_f - E \frac{\partial c_f}{\partial E})}{a^2} \quad (\text{B.8})$$

$a \leq 0$ because the migrant cannot consume more than her foreign wages abroad ($w_f \geq c_f$) and consumption at home must at least equal to wages and savings from abroad ($c_h \geq w_h$). At the same time, $b < 0$ because it can be shown that both $\frac{\partial c_f}{\partial \lambda}$ and $\frac{\partial c_h}{\partial \lambda}$ are negative from the first order conditions B.3 and B.4.

B. Comparative Statics for the Optimization of the Target earner

The optimization problem can be reduced to:

$$\max_{c_f, c_h, t} tu_f(c_f) + (1-t)u_h(c_h) \text{ such that}$$

$$tEc_f + S_t = tw_f \quad (\text{B.9})$$

$$(1-t)c_h = (1-t)y + ES_t - C \quad (\text{B.10})$$

$$ES_t = C \quad (\text{B.11})$$

From B.9, B.10, and B.11, it is easy to solve for optimal c_f and c_h .

$$c_f = w_f - \frac{C}{Et}$$
$$c_h = y$$

Plugging these values into the objective function and taking the first order condition with respect to t produces

$$u'_f \left(w_f - \frac{C}{Et} \right) \left(\frac{C}{Et} \right) + u_f \left(w_f - \frac{C}{Et} \right) - u_h(y) = 0 \quad (\text{B.12})$$

It follows that

$$\frac{dt}{dE} = -\frac{t}{E} \quad (\text{B.13})$$

APPENDIX C

Chapter 3 Appendices

Table C.1: Effect of Nurse Migration on Tertiary School Enrollment and Graduation Rates (without including province specific linear time trends)

	Enrollment (Females & Males)	Enrollment (Female Only)	Enrollment (Males Only)
	(1)	(2)	(3)
Panel A.			
Effect on Nurse Enrollment	101.67* (54.33)	63.38* (35.39)	38.29** (19.19)
R^2	0.82	0.83	0.79
Mean Dependent Variable	3.81	2.67	1.14
Panel B.			
Effect on Other Enrollment	-37.82 (73.13)	-53.01 (57.18)	15.20 (24.90)
R^2	0.96	0.94	0.96
Mean Dependent Variable	34.76	18.64	16.12
	Graduation (Females & Males)	Graduation (Female Only)	Graduation (Males Only)
	(1)	(2)	(3)
Panel C.			
Effect on Nurse Graduation	20.96* (11.25)	15.67** (7.51)	5.29 (3.95)
R^2	0.70	0.71	0.65
Mean Dependent Variable	0.75	0.53	0.22
Panel D.			
Effect on Other Graduation	10.86 (18.45)	-3.55 (12.27)	14.41 (9.53)
R^2	0.80	0.72	0.84
Mean Dependent Variable	5.44	3.15	2.40
N	960	960	960
Mean Year-to-Year Change in the Nurse Migration Rate	0.003	0.003	0.003

Notes: Table C.1 presents regressions similar to Table 3.2 except without including province specific linear time trends in the specification. The sample period is from 2000 to 2012 while the unit of observation is the province-year. All regressions include province and year fixed effects. Robust standard errors are clustered at the province level in parenthesis. The year-to-year change in the nurse migration rate is measured in percentage points. The nurse migration rates used are lagged by 1 year. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Sources: CHED, CFO, and authors' calculations.

Table C.2: The Effect of the 2007 Policy on Nurse Migration Rates and Enrollment

	Nurse Migration (1)	Nurse Enrollment (2)	Nurse Migration (3)	Nurse Enrollment (4)
<i>POST * PreNurseMigrationRate2000</i>	-0.32* (0.18)	-421.31*** (152.52)		
<i>POST * PreNurseMigrationRate2001</i>			-0.26** (0.12)	-340.09*** (84.08)
N	720	720	720	720
R^2	0.86	0.88	0.86	0.89
Mean of Dependent Variable	0.009	4.42	0.009	4.42

Notes: Table C.2 presents estimates of the effect of the abrupt change in visa availability in 2007 on nurse migration and nurse enrollment. Columns (1) and (2) use 2000 as the base year while columns (3) and (4) use 2001. The sample period is from 2004 to 2012 while the unit of observation is the province-year. Robust standard errors are clustered at the province level in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Sources: CHED, CFO, and authors' calculations.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Aigner, Dennis, and Glen Cain.** 2013. “Statistical Theories of Discrimination in Labor Markets.” *Industrial and Labor Relations Review*, 30(2): 175–187.
- Aiken, Linda.** 2007. “US Nurse Labor Market Dynamics are Key to Global Nurse Sufficiency.” *Health Services Research*, 42(3): 1299–1320.
- Arends-Kuenning, Mary, Alvaro Calara, and Stella Go.** 2015. “International Migration Opportunities and Occupational Choice: A Case Study of Philippine Nurses 2002 to 2014.” Working Paper.
- Asia Times.** 2003. “Nurse Exodus Plagues Philippines.”
- Barrett, Alan, and Jean Goggin.** 2013. “Returning to the Question of a Wage Premium for Returning Migrants.” *National Institute Economic Review*, 213: R43–R51.
- Bazzi, Samuel, Arya Gaduh, Alexander Rothenberg, and Wong Maisy.** 2014. “Skill Transferability, Migration, and Development: Evidence from Population Resettlement in Indonesia.” Working Paper.
- Becker, Gary.** 1962. “Investment in Human Capital: A Theoretical Analysis.” *Journal of Political Economy*, 70(5): 9–49.
- Bertrand, Marianne, and Sendhil Mullainathan.** 2004. “Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination.” *American Economic Review*, 94(4): 991–1013.
- Bewley, Truman.** 1998. “Why not Cut Pay.” *European Economic Review*, 42(3): 459–490.
- Bhagwati, Jagdish, and Koichi Hamada.** 1974. “The Brain Drain, International Integration of Markets for Professionals and Unemployment: a Theoretical Analysis.” *Journal of Development Economics*, 1: 19–42.
- Booth, Alison L., Andrew Leigh, and Elena Varganova.** 2012. “Does Ethnic Discrimination Vary Across Minority Groups? Evidence from a Field Experiment.” *Oxford Bulletin of Economics and Statistics*, 74(4): 547–573.
- Borjas, George, and Bernt Bratsberg.** 1996. “Who Leaves? The Outmigration of the Foreign-Born.” *The Review of Economics and Statistics*, 78(1): 165–76.

- Centre d'études Prospectives et d'Informations Internationales (CEPII).** 2011. "GeoDist Database." <<http://www.cepii.fr/anglaisgraph/bdd/distances.htm>, accessed on July 5, 2013>.
- Chand, Satish, and Michael A. Clemens.** 2008. "Skilled Emigration and Skill Creation: A Quasi-experiment." Center for Global Development Working Paper 152.
- Clemens, Michael A.** 2009. "Skill Flow: A Fundamental Reconsideration of Skilled-worker Mobility and Development." Working Paper.
- Clemens, Michael A.** 2013. "What do we Know About Skilled Migration and Development?" Policy Brief.
- Clemens, Michael A.** 2015. "Global Skill Partnerships: A Proposal for Technical Training in a Mobile World." *IZA Journal of Labor Policy*, 4(1): 1–18.
- Clemens, Michael A., Claudio E. Montenegro, and Lant Pritchett.** 2008. "The Place Premium: Wage Differences for Identical Workers Across the US Border." World Bank Policy Research Working Paper No. 4671.
- Co, Catherine Y., Ira N. Gang, and Myeong-Su Yun.** 2000. "Returns to Returning." *Journal of Population Economics*, 13(1): 57–79.
- Constant, Amelie, and Douglas S. Massey.** 2002. "Return Migration by German Guestworkers: Neoclassical versus New Economic Theories." *International Migration*, 40(4): 5–38.
- Dayton-Johnson, Jeff, Antje Pfeiffer, Kirsten Schuettler, and Johanna Schwinn.** 2009. "Migration and Employment." In *Promoting Pro-Poor Growth: Employment*. 144–177. OECD.
- Del Carpio, Ximena V., Caglar Ozden, Mauro Testaverde, and Mathis Wagner.** 2015. "Reversing Brain Drain: Evidence from Malaysias Returning Expert Program." Working Paper.
- Deming, David J., Noam Yuchtman, Amira Abulafi, Claudia Goldin, and Lawrence F. Katz.** 2014. "The Value of Postsecondary Credentials in the Labor Market: an Experimental Study." NBER Working Paper No. w2052.
- Department of Homeland Security (DHS).** 2008. "Improving the Processing of Schedule A Nurse Visas."
- Docquier, Frederic, and Abdeslam Marfouk.** 2006. "International Migration by Educational Attainment (1990-2000)Release 1.1." In *International Migration, Remittances and Development*, ed. Caglar Ozden and Maurice Schiff. New York: Palgrave Macmillan.

- Ducanes, Geoffrey, and Manolo Abella.** 2008. "Overseas Filipino Workers and their Impact on Household Employment Decisions." ILO Working Paper No. 411226.
- Dustmann, Christian.** 2003. "Return Migration, Wage Differentials, and the Optimal Migration Duration." *European Economic Review*, 47(2): 353–369.
- Dustmann, Christian, and Yoram Weiss.** 2007. "Return Migration: Theory and Empirical Evidence from the UK." *British Journal of Industrial Relations*, 45(2): 236–256.
- Dustmann, Christian, Itzhak Fadlon, and Yoram Weiss.** 2011. "Return Migration, Human Capital Accumulation and the Brain Drain." *Journal of Development Economics*, 95(1): 58–67.
- Engman, Michael.** 2010. "A Tale of Three Markets: How Government Policy Creates Winners and Losers in the Philippine Health Sector." Working Paper.
- Eriksson, Stefan, and Dan-Olof Rooth.** 2014. "Do Employers Use Unemployment as a Sorting Criterion When Hiring? Evidence from a Field Experiment." *American Economic Review*, 104(3): 1014–39.
- Gibson, John, and David McKenzie.** 2011. "The Microeconomic Determinants of Emigration and Return Migration of the Best and Brightest: Evidence from the Pacific." *Journal of Development Economics*, 95(1): 18–29.
- Gibson, John, David McKenzie, and Steven Stillman.** 2013. "Accounting for Selectivity and Duration-Dependent Heterogeneity When Estimating the Impact of Emigration on Incomes and Poverty in Sending Areas." *Economic Development and Cultural Change*, 61: 247–280.
- Gruber, Herbert, and Anthony Scott.** 1966. "The International Flow of Human Capital." *American Economic Review*, 56: 268–274.
- Gunawardana, Pamasiri.** 2006. "The Asian Currency Crisis and Australian Exports to East Asia." *Economic Analysis and Policy*, 35(1-2): 73–90.
- Harris, John R., and Michael P. Todaro.** 1970. "Migration, Unemployment and Development: A Two-Sector Analysis." *American Economic Review*, 60(1): 126–142.
- Heckman, James J.** 1979. "Sample Selection Bias as a Specification Error." *Econometrica*, 47(1): 153–161.
- Heckman, James J.** 1998. "Detecting Discrimination." *Journal of Economic Perspectives*, 12(2): 101–16.

- Heckman, James J., and Peter Siegelman.** 1993. "The Urban Institute Audit Studies: Their Methods and Findings." In *Clear and Convincing Evidence: Measurement of Discrimination in America*. 187–258. Washington, D.C.: The Urban Institute Press.
- International Labour Organization.** 2014. "Global Wage Report 2014/15: Asia and Pacific Supplement." Background Report.
- International Organization for Migration.** 2008. "Enhancing the Role of Return Migration in Fostering Development." Background Paper.
- Iskander, Natasha.** 2010. *The Creative State: Migration, Development, and the State in Morocco and Mexico*. Cornell University Press.
- Jasso, Guillermina, and Mark R. Rosensweig.** 1982. "Estimating the Emigration Rates of Legal Immigrants Using Administrative and Survey Data: The 1971 Cohort of Immigrants to the United States." *Demography*, 19(3): 279–290.
- Jasso, Guillermina, Vivek Wadhwa, Gary Gereffi, Ben Rissing, and Richard Freeman.** 2010. "How Many Highly Skilled Foreign-Born are Waiting in Line for U.S. Legal Permanent Residence?" *International Migration Review*, 44(2): 477–498.
- Jobstreet.** 2011. "Mobile Trend Seen Amongst Filipino Jobseekers." Press Release <<http://www.jobstreet.com.ph/aboutus/preleases119.htm>, accessed Nov. 18, 2014>.
- Jonkers, Koen.** 2008. "A Comparative Study of Return Migration Policies Targeting the Highly Skilled in Four Major Sending Countries." MIREM Project Analytical Report, 2008/05.
- Kirdar, Murat G.** 2013. "Source Country Characteristics and Immigrants' Optimal Migration Duration Decision." *IZA Journal of Migration*, 2(1): 1–21.
- Kroft, Kory, Fabian Lange, and Matthew Notowidigdo.** 2013. "Duration Dependence and Labor Market Conditions: Evidence from a Field Experiment." *Quarterly Journal of Economics*, 128(3): 1123–1167.
- Lanning, Jonathan A.** 2013. "Opportunities Denied, Wages Diminished: Using Search Theory to Translate Audit Pair Study Findings into Wage Differentials." *B.E. Journal of Economic Analysis and Policy*, 13(2): 921–58.
- Lin, Winston.** 2013. "Agnostic Notes on Regression Adjustments to Experimental Data: Reexamining Freedmans Critique." *Annals of Applied Statistics*, 7(1): 295–318.
- Lowell, Lindsay B.** 2001. "Policy Responses to the International Mobility of Skilled Labour." International Migration Papers 45.

- Makin, Tony.** 1999. "The Asian Currency Crisis and the Australian Economy." *Economic Policy and Analysis*, 29(1): 77–85.
- McKenzie, David, and Dean Yang.** 2015. "Evidence on Policies to Increase the Development Impacts of International Migration." *World Bank Research Observer*, 30(2): 155–192.
- Mesnard, Alice.** 2004. "Temporary Migration and Capital Market Imperfections." *Oxford Economic Papers*, 56(2): 242–262.
- Mincy, Ronald B.** 1993. "The Urban Institute Audit Studies: Their Research and Policy Context." In *Clear and Convincing Evidence: Measurement of Discrimination in America*. 165–86. Washington, D.C.: The Urban Institute Press.
- Moretti, Enrico.** 2004. "Workers' Education, Spillovers, and Productivity: Evidence from Plant-level Production Functions." *American Economic Review*, 94(3): 656–690.
- Mountford, Andrew.** 1997. "Can a Brain Drain be Good for Growth in the Source Economy?" *Journal of Development Economics*, 53: 287–303.
- Munshi, Kaivan.** 2003. "Networks in the Modern Economy: Mexican Migrants in the U.S. Labor Market." *Quarterly Journal of Economics*, 118(2): 549–599.
- Nekoie, Arash.** 2013. "Immigrants Labor Supply and Exchange Rate Volatility." *American Economic Journal: Applied Economics*, 5(4): 144–64.
- Newland, Kathleen, Dovelyn R. Agunias, and Aaron Terrazas.** 2008. "Learning by Doing: Experiences of Circular Migration." Migration Policy Institute Policy Brief.
- Oreopoulos, Philip.** 2011. "Why Do Skilled Immigrants Struggle in the Labor Market? A Field Experiment with Thirteen Thousand Resumes." *American Economic Journal: Economic Policy*, 3(4): 148–71.
- Organization for Economic Development and Cooperation.** 2007. "Immigrant Health Workers in OECD Countries in the Broader Context of Highly Skilled Migration." In *International Migration Outlook, SOPEMI 2007 Edition*. Paris: OECD Publishing.
- Organization for Economic Development and Cooperation.** 2014. *International Migration Outlook 2014*. Paris: OECD Publishing.
- Ozden, Caglar, and David Phillips.** 2015. "What Really is Brain Drain? Location of Birth, Education, and Migration Dynamics of African Doctors." KNOMAD Working Paper 4.
- Park, Yung Chul.** 1996. "East Asian Liberalization, Bubbles, and the Challenge from China." *Brookings Papers on Economic Activity*, 96(2): 357–371.

- Phillips, Janet, Michael Klapdor, and Joanne Simon-Davies.** 2010. "Migration to Australia since federation: a guide to the statistics." Background Note, Australian Parliamentary Library. <<http://aphnew.aph.gov.au/binaries/library/pubs/bn/sp/migrationpopulation.pdf>>, accessed July 5, 2013>.
- Piore, Michael.** 1979. *Birds of Passage: Migrant Labor and Industrial Societies*. New York: Cambridge University Press.
- Queensland Treasury and Trade.** 1998. "Annual Economic Report, 1997-1998." <<http://www.qgso.qld.gov.au/products/reports/annual-econ-report/annual-econ-report-1997-98.pdf>>, accessed June 21, 2013>.
- Radelet, Steven, and Jeffrey D. Sachs.** 1998. "The East Asian Financial Crisis: Diagnosis, Remedies, Prospects." *Brookings Papers on Economic Activity*, 28(1): 1–74.
- Radelet, Steven, and Jeffrey D. Sachs.** 1999. "What Have We Learned, So Far, From the Asian Financial Crisis." CAER Discussion Paper No. 37.
- Reinhold, Steffen, and Kevin Thom.** 2013. "Migration Experience and Earnings in the Mexican Labor Market." *Journal of Human Resources*, 48(3): 768–829.
- Saxenian, Anna Lee.** 2006. *The New Argonauts: Regional Advantage in a Global Economy*. Cambridge, MA: Harvard University Press.
- Shrestha, Slesh A.** Forthcoming. "No Man Left Behind: Effects of Emigration Prospects on Educational and Labor Outcomes of Non-migrants." *Economic Journal*.
- Sjaastad, Larry A.** 1962. "The Costs and Returns of Human Migration." *Journal of Political Economy*, 70(5): 80–93.
- Spilimbergo, Antonio.** 2009. "Democracy and Foreign Education." *American Economic Review*, 99(1): 528–543.
- Stark, Oded, Christian Helmenstein, and Yury Yegorov.** 1997. "Migrants' Savings, Purchasing Power Parity, and the Optimal Duration of Migration." *International Tax and Public Finance*, 4(3): 307–324.
- Stark, Oded, Christina Helmenstein, and Alexia Prskawetz.** 1997. "A Brain Gain with a Brain Drain." *Economic Letters*, 55: 227–234.
- Theoharides, Caroline.** 2014. "Manila to Malaysia, Quezon to Qatar: International Migration and the Effects on Origin-Country Human Capital." Working Paper.
- United Nations Department of Economic and Social Affairs (Population Division).** 2013. "The Number of International Migrants Worldwide Reaches 232 million." Policy Note.

- United States Citizenship and Immigration Services (USCIS).** 2007. “Annual Report to Congress June 2007.”
- Van Eyck, Kim.** 2004. “Women and International Migration in the Health Sector.” Final Report of Public Services Internationals Participatory Action Research 2003.
- Wahba, Jackline.** 2015. “Who Benefits from Return Migration to Developing Countries.” *IZA World of Labor*.
- World Bank.** 2013. “World Development Indicators.” <<http://data.worldbank.org/data-catalog/world-development-indicators>, accessed July 5, 2013>.
- World Economic Forum.** 2014. “The Global Gender Gap Report 2014.”
- Yang, Dean.** 2006. “Why Do Migrants Return to Poor Countries? Evidence from Philippine Migrants Responses to Exchange Rate Shocks.” *Review of Economics and Statistics*, 88(4): 715–735.