REStat Fellowship for NBER Summer Institute Application

Personal Information:

Alejandro Gutierrez-Li, Ph.D.
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Assistant Professor, North Carolina State University
Ph.D. obtained in May 2020 from Washington University in St. Louis
https://alejandrogli.weebly.com/

Summary of Research:

My main research field is labor economics. I work primarily on topics related to a) immigration, b) entrepreneurship, and c) the combination of these two. Some of my current work looks at the role of pre-migration work experience of immigrants in their labor market outcomes in the United States, factors affecting recent trends in Mexico-US migration, and the impact of immigration enforcement policies on local self-employment outcomes of both the native and the foreign-born population. In addition, I am doing research related to the decline in the agricultural labor supply and the trade-offs between labor-intensive production processes and investments in automation and mechanization. I also do policy-oriented work on the economic outcomes of Hispanics and other minorities in the U.S.

Summer Institute sessions most interested in attending:

Labor Studies, Personnel Economics, Aging, Public Economics, Urban Economics, Education

Alejandro Gutiérrez-Li, Ph.D.

April 17, 2023

North Carolina State University
Agricultural and Resource Economics
Nelson Hall 4338, Campus Box 8109
2801 Founders Drive
Raleigh, NC, USA 27695

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EDUCATION

WASHINGTON UNIVERSITY IN ST. LOUIS

Ph.D. in Economics, May 2020

Dissertation title: Essays on Immigration and Entrepreneurship

Committee: Barton Hamilton (chair), George-Levi Gayle, Costas Azariadis

M.A. in Economics, 2016

ITAM (MEXICO CITY)

M.A. in Economic Theory

UNIVERSITY OF COSTA RICA

Licenciatura in Economics

B.A. in Economics (with highest honors)

PROFESSIONAL POSITIONS

NORTH CAROLINA STATE UNIVERSITY

August 2020-present:

Assistant Professor, Department of Agricultural and Resource Economics

Member, Economics Graduate Faculty, Department of Economics, Poole College of Management

Extension Economist, College of Agriculture and Life Sciences

Faculty Affiliate, Plant Sciences Initiative, November 2022-

INTERESTS

Labor economics, applied microeconomics, economics of immigration, entrepreneurship

RESEARCH

Published and forthcoming

Self-Employment and Migration: Evidence from Mexico.
American Economic Association Papers and Proceedings. May 2022

The Self-Employment Effects of Secure Communities in the United States (with Raffi Garcia). Forthcoming *American Economic Association Papers and Proceedings*.

Recipient of the best paper award on Hispanics' Business and Entrepreneurship research by the Kauffman Foundation and the American Society of Hispanic Economists.

Working Papers

Home Country Work Experience and Immigrant Self-Employment in the U.S. *Revise and Resubmit*

Business Ownership and Mexico-US Immigration

Leave or Stay? The Role of Non-pecuniary Benefits in Workers' Willingness to Remain in Agriculture (with Rodolfo Nayga, Jeffrey Luckstead, and Karina Gallardo)

Family CEOs, Turnover, and Firm Performance (with Barton Hamilton and Andrés Hincapié)

Work in Progress

Determinants of Mechanization Adoption in the Dairy Sector (with Cesar Escalante, Luis Pena, Shaheer Burney, and Grace Melo)

Climate Change and the Agricultural Labor Supply (with Roderick Rejesus)

The Impact of Immigration Enforcement on Entrepreneurship

PUBLICATIONS IN SPANISH (peer-reviewed)

Determinants and differences in tax moral in Central America. An analysis from the 2005 Latinobarometer (published in Spanish as Determinantes y diferencias en la moral fiscal en Centroamérica. Un análisis desde el Latinobarómetro 2005). (2011). *Revista de Ciencias Económicas*, Universidad de Costa Rica, 29.1

Market power, economies of scale and scope in the Costa Rican banking system during the period of 1997-2009 (published in Spanish as Poder de mercado, economías de escala y de ámbito en el sistema bancario costarricense durante el periodo 1997-2009). (2014). *Serie de Divulgación Económica*, IICE, Universidad de Costa Rica, 28

OTHER PEER-REVIEWED PUBLICATIONS (POLICY/OUTREACH/EXTENSION)

8. The Christmas Tree Industry in North Carolina: Characteristics and Challenges Ahead. (2023). NC State Economist. November-December 2022, Part 2.

7. Adverse Effect Wage Rates of H-2A Workers Increase in 2023.

Southern Ag Today 3(3.5). January 20, 2023

6. Urban Development and Farm Labor Scarcity: Are Workers Leaving Agriculture for Construction?

Southern Ag Today 2(50.5). December 9, 2022

5. Job Market Behavior During Pandemic Times.

S*outhern Ag Today* 2(33.5). August 12, 2022

4. Immigration Projects under Discussion: Why do They Matter for the Agricultural Labor Supply?

Southern Ag Today 2(32.5). August 5, 2022

3. The H-2A Visa Program: Addressing Farm Labor Scarcity in North Carolina. (2021). NC State Economist. Summer 2021.

Featured by the NC Farm Bureau, Daily Briefing, 7/14/21

2. The H-2A Visa Program in North Carolina. (2021). Factsheets, NC State Extension Publications. Available online at: https://content.ces.ncsu.edu/the-h-2a-visa-program-in-north-carolina

1. Analysis of the contribution of recreational and commercial fisheries to the Costa Rican economy, with Fernández, C; González, G; Lucke, R; Rojas, F; Yong. M. (2010). Technical report. IICE, University of Costa Rica. Sponsored by The Billfish Foundation.

COMPETITIVE GRANTS

Southern Sustainable Agriculture Research and Education, Co-P.I., **$345,000**; 2023-2026

Northern Sustainable Agriculture Research and Education, Co-P.I., **$249,945**; 2022-2024

National Institute of Food and Agriculture (USDA), P.I., **$20,000**; 2021-2026

North Carolina Christmas Tree Association, P.I., **$3,000**; 2020-2023

HONORS AND AWARDS

Travel award, Russell Sage Foundation, 2023

Best paper presentation award on Hispanics' Business and Entrepreneurship research, Kauffman Foundation and American Society of Hispanic Economists, 2022

Mentee, Diversity Initiative for Tenure in Economics, Duke University, 2020-present

NC State Impact Scholar, 2022

Travel award, Northeastern Agricultural and Resource Economics Association, 2022

Travel award, American Economic Association. 2022, 2023

Travel award, DITE. 2021, 2022 (x2)

Travel award, Institute for Humane Studies. 2019, 2020, 2022

University fellowship, Washington University. 2014-2019

Summer research fellowship, Washington University. 2016-2019

Preparation in pedagogy certificate, Teaching Center, Washington University, 2019

Travel award, Washington University. 2016, 2017, 2019, 2020

Master studies fellowship, ITAM. 2012-2014

Academic excellence scholarship, University of Costa Rica. 2006-2011

Graduation with highest honors, University of Costa Rica

Dr. Frankin Chang Díaz scholarship for English studies, American-Costa Rican Cultural Center (CCCN). 2009-2010

TEACHING AND MENTORING EXPERIENCE

WASHINGTON UNIVERSITY

Instructor

Political Economy, Summer 2017, Summer 2016

Teaching Assistant

Economics and Society (for Prof. Costas Azariadis), Spring 2018
Political Economy (for Prof. Valerio Dotti), Fall 2017
Intermediate Macroeconomic Theory (for Prof. Costas Azariadis), Spring 2017
Introduction to Microeconomics (for Prof. Sudeshna Bandyopadhyay), Fall 2016
Understanding the Financial Crisis (for Prof. Fernando Martin), Spring 2016
Behavioral and Experimental Economics (for Prof. Brian Rogers), Fall 2015

Professional Development in Teaching:

Preparation in Pedagogy Program, certificate awarded in September of 2019

Professional development program facilitated by the Teaching Center at Washington University that provides formalized training in pedagogy. The program emphasizes evidence-based classroom strategies supported by current educational research.

Workshops taken:

Fostering an Inclusive Classroom Climate, Addressing Diversity and Inclusion, Leading Engaging Discussions, Responding Effectively to Student Writing, Developing Effective Summative Assessments, Facilitating Challenging Conversations, Writing a Teaching Philosophy Statement, Creating a Teaching Portfolio.

UNIVERSITY OF COSTA RICA

Teaching Assistant

Multiple courses in the Economics and Mathematics departments, 2005-2011

STUDENT ADVISING AT NC STATE UNIVERSITY

Year denotes anticipated completion date

Graduate Students

Chair:

Roberto Rosales, Master of Arts in Liberal Studies, 2023

Committee member:
Kihong Kim, Ph.D. in Economics, 2023
Tim Choi, Ph.D. in Economics, 2023
Eve Oh, Ph.D. in Economics, 2022

Undergraduate Students

Mentor and supervisor of research assistants:
Tyler Stocks
Jason Oliva-Milla
Mustafa Siddiqui

OTHER

Guest speaker. ARE 303. Farm Management. Spring 2023. NC State University.

Keynote Speaker. *Do's and Don'ts of Life in College*. Mexican Studies Institute, City University of New York. Webinar, January 31, 2022.

Panelist. *Networking and Interacting with the Media.* American Economic Association. Summer Mentoring Pipeline Conference, Washington DC, June 17, 2022.

RESEARCH CONFERENCES AND PRESENTATIONS

2023

U.C. Berkeley, Summer Institute in Migration Research Methods (Berkeley, CA)
AEA Summer Meeting for Underrepresented Minority Economists (Washington, DC)
Agricultural and Applied Economics Association (Washington, DC)
U.C. Davis (pres. by coauthor)
NBER Immigrants and the U.S. Economy Conference (virtual; invited discussant only)
American Economic Association/ASSA Annual Meeting (pres. by coauthor)

2022

Southern Economic Association Annual Conference (Fort Lauderdale, FL)
ASHE (virtual)
Agricultural and Applied Economics Association (Anaheim, CA)
DITE, Duke University (Durham, NC)
AEA Summer Meeting for Underrepresented Minority Economists (Washington, DC)
NAREA (Mystic, CT)
City University of New York (CUNY)-Lehman College (virtual)
American Economic Association/ASSA Annual Meeting (virtual)

2021

DITE Annual Research Conference (Washington, DC)
Agricultural and Applied Economics Association (Austin, TX)
Western Economic Association International Annual Meeting (virtual; presenter and discussant)
CSMGEP-CSWEP/WEAI (virtual; presenter and discussant)
Triangle Applied Microeconomics Conference (virtual)
Midwest Economics Association Annual Meeting (virtual)

2020

DITE (virtual)
ITAM Alumni Conference (virtual)
Western Economic Association International Annual Conference (session cancelled)
Tecnológico de Monterrey (virtual)

2019

Southern Economic Association Annual Conference (Fort Lauderdale, FL)
Latin American Meeting of the Econometric Society (Puebla, Mexico)
Economics Graduate Student Conference (St. Louis, MO)
Midwest International Trade Fall Conference (St. Louis, MO)
Indiana University (Bloomington, IN)
Midwest Economics Association/Society of Labor Economists Annual Meeting (presenter and discussant) (St. Louis, MO)
Washington University (St. Louis, MO)

2018

Washington University (St. Louis, MO)

2017

Washington University (St. Louis, MO)

RESEARCH EXPERIENCE

ITAM, Center for Economics Research (CIE)
Research assistant, 2013-2014

UNIVERSITY OF COSTA RICA, Economics Institute of Research (IICE)
Economics researcher, 10/2010-12/2011
Research assistant, 05/2008-09/2010

CENTRAL BANK OF COSTA RICA (BCCR)
Summer internship, 06/2013-07/2013

EXTENSION/OUTREACH

Workshops and Presentations

13. Keynote Invited Speaker, Pickle Packers International (PPI). Raleigh, NC. April 2023

12. NC Christmas Tree Association. Winter Meeting. Boone, NC. February 2023

11. Invited Speaker, NC Society of Farm Managers and Rural Appraisers. Raleigh, NC. February 2023

10. NC Extension Annual Conference, Greensboro, NC. October 2022

9. Virginia Cooperative Extension, Keynote Invited Speaker, Virginia Tech (virtual). July 2022

8. Green Industry Research Consortium. Multi-state Hatch. Raleigh, NC. Fall meeting. September 2022 (co-organizer)

7. NC Christmas Tree Association. Winter Meeting. Boone, NC. February 2022

6. Agricultural Labor in NC, Extension Annual Conference, virtual meeting. October 2021

5. Carbon Markets, Conservation Practices, and Ag. Labor (with R. Rejesus and E. Edwards), Extension Annual Conference, virtual meeting. October 2021

4. Invited Speaker. Agricultural Labor Outlook. Southern Outlook Conference, Atlanta, GA. September 2021

3. Green Industry Research Consortium. Multi-state Hatch, virtual Fall meeting. September 2021

2. Green Industry Research Consortium. Multi-state Hatch, virtual Winter meeting. March 2021

1. Agricultural Labor Outlook, Extension Agent Educational Series, ARE/NCSU. November 2020 (virtual meeting)

Ongoing Projects

Survey of North Carolina Christmas Trees growers' labor needs, November 2020-present

Sustainable Practices, Economic Contributions, Consumer Behavior, and Labor Management in the U.S. Environmental Horticulture Industry (interdisciplinary multi-state Hatch project), November 2020-present

Meetings

15. NC Christmas Tree Association. Winter Meeting. Boone, NC. February 2023

14. Tobacco Growers Association of NC 2023 Annual Meeting. Raleigh, NC. February 2023

13. Tobacco specialists and agents, virtual meeting. November 2022

12. Farmworker Health and Safety Educators Training Meeting. Raleigh, NC. November 2022

11. Plant Science Initiative Backroad Tour. Wilson, Rocky Mount and Nashville, NC. October 2022

10. 2022 Sweet Potato Field Day. Cunningham Research Station. Kinston, NC. October 2022

9. Farm Labor Committee. North Carolina Farm Bureau Meeting. Raleigh, NC. July 2022

8. NC Christmas Tree Association. Winter Meeting. Boone, NC. February 2022

7. Green Industry Research Consortium. Multi-state Hatch, virtual meeting. February 2022

6. 2021 Sweet Potato Field Day. Clinton, NC. October 2021

5. Green Industry Research Consortium. Multi-state Hatch, virtual meeting. September 2021

4. Farm Labor Committee. North Carolina Farm Bureau 2021 Meeting. Raleigh, NC. July 2021

3. Green Industry Research Consortium. Multi-state Hatch, virtual meeting. March 2021

2. NC Certified Sweet Potato Seed Producers Association Annual Meeting, virtual meeting, February 2021

1. Research Committee. North Carolina Christmas Tree Association, virtual meeting. December 2020

OTHER ACADEMIC ACTIVITIES

Summer Institute in Migration Research Methods, U.C. Berkeley, June 2023

Dissertation Writing Retreat, Writing Center, Washington University, August 2017

NBER Entrepreneurship Research Boot Camp, Boston, MA, July 2017

Summer School in Socioeconomic Inequality, HCEO, University of Chicago, July 2016

PROFESSIONAL ENGAGEMENT

Referee

Journal of Population Economics (x2), World Development, Agricultural Economics, Journal of Extension, USDA-ERS Economic Information Bulletin, Revista de Ciencias Económicas

Reviewer

BARD US-Israel Binational Agricultural Research and Development Fund, AAEA Annual Conference (2021, 2022) abstract reviewer, WashU Economics Graduate Student Conference

Memberships

American Economic Association, Society of Labor Economists, Agricultural and Applied Economics Association, Midwest Economics Association, European Association of Labor Economists, Northeastern Agricultural and Resource Economics Association, Southern Economic Association, Southern Agricultural Economics Association, American Society of Hispanic Economists

Committee Service

Guest Editor, Hispanic Economic Outlook. Issue on Hispanics' Business and Entrepreneurship, Spring 2024
Distinguished Outreach/Extension Award, AAEA, 2023-
Hispanic Economic Outlook, American Society of Hispanic Economists, 2022-
Farmworker Pesticide Education Program, NCSU, September 2020-

MEDIA ENGAGEMENT

Interview about employment outlook for Hispanics and Blacks. New York City News Service. (March 22, 2023).

Lab Rats to Field Mice: The N.C. Plant Sciences Initiative's Inaugural Backroad Tour. *CALS News*. (November 1, 2022).

AAEA Column. *Members in the News*. (September 19, 2022).

Food costs up 10% in a year, but immigration reform might help, some experts say. ***The National Desk***. (September 8, 2022).

AAEA Column. *Members in the News*. (September 12, 2022).

Farmers Push for Immigration Reform to Counter Labor Shortages and Rising Food Prices ***NBC News***. (September 5, 2022).

From Robots to Customers: Exploring New Opportunities for Dairy Farmers. *CALS News.* (August 2, 2022).

AAEA Column. *Members in the News*. (March 7, 2022).

Labor Shortage for NC farmers Ripples Across Broader Economy. ***Triangle Business Journal***. (February 18, 2022).

Gutierrez-Li Selected for NC State Impact Scholars Program. *ARE January Newsletter*. (January 27, 2022) and *CALS News.* (February 1, 2022).

Interview about the H-2A Visa Program. ***Triangle Business Journal***. (January 13, 2022).

AAEA Column. *Members in the News*. (August 16, 2021).

US Jobless Claims Rose to 419,000 Last Week. ***Wall Street Journal*** (and others). (July 22, 2021).

Introducing Dr. Alejandro Gutierrez-Li. *CALS News and ARE November Newsletter.* (November 2, 2020).

North Carolina Farm Bureau Report. (November 6, 2020).

SKILLS

Computer

Stata, Matlab, R, Eviews, Python, LaTeX

Languages

English (fluent), Spanish (native); Mandarin, Cantonese, French, and German (basic)

UNIVERSITY SERVICE AT NCSU

Co-organizer, Brownbag Seminar for Applied Microeconomics (BAM) with Melinda Morrill and Raymond Guiteras, 2021-

Search committee member for a Farm Management Extension Associate position, ARE, 2021

ARE Representative, NC State Employees Combined Campaign, 2021-2022

Home Country Work Experience and Immigrant Self-Employment in the U.S.

Abstract

Immigrant entrepreneurship in the United States has grown steadily in the last four decades. In this paper, I study the occupational choices of legal permanent residents and their associated earnings in paid and self-employment. Using a unique data set with pre- and post-migration individual level information, I analyze the role of home country work experience of immigrants in their probability of becoming entrepreneurs and their earnings after migration. To control for endogenous sector selection in the estimation of earnings distributions, I follow a novel identification strategy based on extremal quantile regressions that does not require exclusion restrictions or a large support variable. I find that foreign work experience in paid and self-employment is an important predictor of entrepreneurship after migration. In addition, it impacts earnings in the US but differently across sectors, controlling for human capital, assimilation, time, region, and demographic characteristics. Overall, my results highlight the role played by immigrants' labor market performance in their home countries to better understand their outcomes in the US.

JEL codes: L26, F22, J61, M13, J24, C51

Keywords: Entrepreneurship, self-employment, human capital, labor supply, immigration

1. Introduction

Almost 45 million immigrants currently live in the United States. Of those, roughly 13 million have lawful permanent status and are fully incorporated into the American labor market (Baker, 2016). The numbers have increased over the last four decades and today, around 15% of the US population is foreign-born, reaching historical peaks (Pew Research Center, 2015). At the same time, the immigrant self-employment share has risen from around 7% in 1980 to close to 20% in 2010, in clear contrast to the steady decline in native-born entrepreneurship and startup rates (Fairlie and Lofstrom, 2015). The outcomes of immigrants affect the American economy in many ways, which has led to vigorous political debates recently. From an economics point of view, however, the driving factors behind the entrepreneurship decisions of immigrants and their productivity in the U.S. remain poorly understood.

In this paper, I analyze the occupational choices of immigrants between paid and self-employment in the U.S. and their associated earnings in either sector[1]. In particular, I study the role of pre-migration work experience in both of these aspects taking into consideration that individuals are only observed in the sector where they work in and that their decisions are not random. Most of the previous literature on immigrant entrepreneurship has not considered the role that the labor market performance of immigrants in their home countries plays in their outcomes in the US. I find that home country work experience has a significant influence in the decision to become self-employed after migration, and it also impacts earnings. My results highlight the importance of pre-migration labor market information to get a better understanding of the experiences of immigrants in the U.S., which is of interest from the point

[1] I use the terms foreign-born and immigrant, and self-employment and entrepreneurship, as synonyms throughout the paper.

of view of immigration policies intended at attracting individuals with the proclivity to open firms and create jobs.

I use the two waves of the New Immigrant Survey (NIS). The NIS contains a rich set of information about individuals who were granted legal permanent residency in 2003. Contrary to other data sets used to study the outcomes of immigrants, the NIS has data on the labor history of individuals prior to migrating. This unique feature allows me to incorporate aspects of the pre-migration work history of immigrants that most previous studies have missed. The NIS also has post-migration data on three US jobs, which facilitates a deep analysis of the link between pre- and post-migration labor market outcomes.

The analysis of this paper focuses on two fundamental aspects of the experiences of immigrants in the US labor market. The first one relates to their occupational choices between paid and self-employment. The second one pertains to the earnings associated with working in either sector. Individuals choose an occupation based on their comparative advantage, non-pecuniary benefits, and expected earnings potential. Likewise, immigrants are only observed in the job they have chosen. This self-selection could lead to biased estimates of the earnings distributions in both sectors if not properly controlled for (Heckman, 1979). I deal with this challenge by following a novel estimation approach based on extremal quantile regressions that does not require an exclusion restriction or a large support variable. Identification is based on the independence between the explanatory variables and selection for large values of the outcome (D'Haultfœuille et al., 2018).

I find that immigrants who worked only as entrepreneurs before moving are approximately 6.8 percentage points more likely to be self-employed in the U.S., while individuals with home experience in both types of jobs are around 4.7 percentage points more likely to be

entrepreneurs after migration compared to people who only worked in salaried occupations. These findings are relative to an unconditional post-migration self-employment probability of around 12%. The number of years since an immigrant left their home country, the kind of visa people had before obtaining residency, and education levels are also determining factors of US self-employment. Pre-migration experience enhances self-employment earnings in the U.S. after controlling for sector selection, but the effect is not strong. In contrast, it carries a penalty for individuals that work for wages in the US.

Having a better understanding of the factors that influence the entrepreneurship decisions of immigrants is relevant both from a macroeconomic and a microeconomic perspective. From a macroeconomic point of view, the significant role of the foreign-born in the creation of new firms and jobs in the U.S. has direct implications for innovation and overall economic growth. At the same time, the immigrant population in the U.S. is not homogeneous. From a microeconomic perspective, there is evidence that self-employment has served as a route out of poverty for certain immigrant groups with lower skills (Fairlie and Woodruff, 2007) and a faster way to ascend the income and wealth ladders than paid employment (Light, 1972); (Holtz-Eakin et al., 2000).

Most of the literature on immigration has focused on how the foreign-born fare in the salaried labor markets, particularly in terms of wage growth, discrimination, or crowding-out effects on the native-born. Surprisingly, less attention has been paid to the outcomes of immigrants as entrepreneurs in spite of its growing relevance for the economy (Borjas, 1986); (Kerr and Kerr, 2016). Other studies have considered the self-employment experiences of particular groups (e.g. Mexicans or East Asians) and not of a representative sample of immigrants from different countries. The NIS has information on immigrants from many

nations, which provides a more complete understanding of the phenomenon as a whole.

Recent policy initiatives have been implemented to foster immigrant self-employment in the country[2]. Several studies have shown that immigrants have higher self-employment rates than the native-born in many developed nations[3]. Likewise, the share of businesses owned by immigrants has gone up substantially over the last four decades, to the point that nearly 20% of all firms in the U.S. in 2010 were owned by this group (Fairlie and Lofstrom, 2015). Unlike the native-born population, immigrants' performance is also determined by their assimilation to a different country, their unequal access to financial capital, lack of the necessary host-country human capital to compete in the labor market (e.g. English skills), and pre-migration outcomes.

While the rates of self-employment of immigrants have gone up over the last forty years, the fraction of Americans engaging in entrepreneurial activities has been declining consistently. This phenomenon is well documented in the literature (Pugsley and Sahin, 2015) and has led to some concerns given the evidence backing up the importance of startups and innovation for job creation and productivity growth (Haltiwanger et al., 2014). At the same time, there are current proposals to modify the American immigration system to one based on skills rather than family relations, as has been done in other countries. Some of these initiatives (like the Startup Act in Congress) prioritize the allocation of visas to individuals with the highest productivity potential. For this reason, a good understanding of the factors that could

[2] Some examples include: The International Institute of St. Louis which has funding opportunities to help immigrants implement their business ideas; Offices of New Americans in major metropolitan areas which provide support to entrepreneurs; The Startup Act currently in Congress which has a specific section to encourage immigrant entrepreneurship (and create a visa for this purpose), among others.

[3] See Fairlie and Lofstrom (2015) for details and references.

make a future immigrant more productive in the U.S. is fundamental for an informed public policy.

The rest of the article is organized as follows. Section 2 provides a theoretical background and analyzes the related literature. Section 3 describes the data. Section 4 presents the econometric framework of the paper. Section 5 shows the main results and section 6 concludes.

2. Theoretical Background

In the first part of this section, I describe the main factors that the literature has considered to explain the self-employment decisions of immigrants. Some of these variables include human and financial capital, family and household characteristics, home country business experience, ethnic enclaves, and legal status (Fairlie and Lofstrom, 2015; Li, 2001). I then provide the theoretical predictions associated with the impact of some of these factors on the occupational choices of newcomers. In the second part of this section, I explain how this paper relates to previous research on immigrant entrepreneurship.

2.1 Determinants of Self-Employment

The two most commonly used variables associated with immigrants' human capital are education and proficiency in the language spoken in the host country. Education has been found to play an important role in the success or failure of small firms, although there is still no strong consensus on its directional impact on entry into self-employment. On one hand, more educated individuals could have access to better opportunities in the wage sector, thus having higher opportunity costs of entrepreneurship. Higher costs, in turn, could reduce the likelihood of choosing self-employment. On the other hand, education could allow individuals to obtain analytical or communication skills that could increase the success of a business and hence the probability of choosing entrepreneurship (Fairlie and Lofstrom, 2015). In addition, evidence shows that education can have a differential impact on the self-employment probabilities across ethnic groups. For instance, Fairlie and Woodruff (2007) found that low education levels explain the lower business ownership rates of Latinos in the US. On the contrary, the high rates of self-employment among Asians are in part explained by their relatively higher levels of schooling (Fairlie, 2005).

The impact of English skills on the likelihood of self-employment is not clear. While having a better command of the language has been found to have a positive association with the odds of choosing entrepreneurship, English fluency can facilitate access to jobs in the salaried sector, thus decreasing the probability of self-employment (Fairlie and Lofstrom, 2015). In principle, limited English skills could hinder interactions with customers and suppliers but could also reduce the potential to get a wage job.

Age and the number of years since an immigrant left the home country can influence the propensity to choose self-employment. Acquiring the necessary resources to start a business can take time, particularly if it is done in a country different from where a person was born. Hence, one could expect a positive relationship between these two variables and the likelihood of entrepreneurship (Borjas, 1986)[4]. The number of years since migration is considered a proxy for assimilation, as it relates to the time a person has been outside of the place where he or she is more culturally comfortable, therefore raising their odds of adapting to the new country. More time abroad could allow an immigrant to develop stronger local networks, acquire valuable human capital (like better English skills), and accumulate wealth.

Family and household composition are elements that have been found to affect the occupational choices of the native-born population. For example, some small businesses are generally run by families, where different generations are involved including the children of the household head. In addition, individuals with a higher number of kids might value more the time flexibility that self-employment allows, thus being more likely to choose that sector. To account for the role of family composition in the self-employment decisions of immigrants,

[4] Notice, however, that this prediction relies on the assumption that age and years since migration are relatively less relevant for paid employment earnings growth.

I control in the estimations for the number of kids the person had before moving to the US[5].

This paper focuses on the role of pre-migration work experience in the self-employment decisions and earnings of immigrants in the US. The relationship between pre- and post-migration outcomes is not well understood in the literature from neither a theoretical nor an empirical point of view (Fairlie and Lofstrom, 2015). Theoretically, individuals who worked in self-employment before migrating could have developed a preference for this sector (or acquire entrepreneurship-specific skills) thus being more likely to choose this activity in the U.S. (Yuengert, 1995). Nevertheless, it could be the case that barriers to entry (e.g. licensing) or other factors such as limited education or English skills, could force immigrants with home country self-employment experience to choose a different activity in the US. Likewise, skills that could make an individual more prone to be self-employed in the home country may not be perfectly transferable or valuable in the host economy (Hendricks and Schoellman, 2017).

The majority of empirical studies that have analyzed the role of home country entrepreneurship in post-migration outcomes have relied on aggregate rather than individual-level measures of self-employment. In addition, the findings of these papers have been mixed. I expand the analysis by Akee et al. (2013) who used the first round of the NIS only and found a positive association between pre- and post-migration self-employment. In addition, their study did not analyze immigrants' earnings in the US. Understanding the role of pre-migration experience in post-migration earnings is relevant for multiple reasons. First, there are fiscal effects associated with the incomes of immigrants. If their earnings are low, tax contributions

[5] Although the total number of kids is available in the data (and the marital status after migration), only variables determined before the person moved to the U.S. can be considered since, otherwise, they could be endogenous to the migration decision. The NIS also asked (in the first round) about asset holdings, but not about the time of their acquisition (so it is not possible to know if it was before or after the person came to the U.S.).

are going to be low, and individuals may be more likely to rely on welfare programs. Second, immigrants with higher productivity can be complements to the native-born and generate jobs. Third, immigrant entrepreneurs with high productivity can help drive innovation and economic growth. Fourth, immigration policies based on skills (like the entrepreneurship visa) are not intended at providing incentives for people to choose self-employment per se. Instead, their goal is to attract individuals with high earnings potential for the reasons described above.

To my knowledge, no previous paper has analyzed the role of home country work experience in earnings after migration. While experience running a business could enhance an individual's productivity in this type of occupation, it is not clear whether those skills are equally valuable in the host economy. In addition, self-employment is widespread in many developing countries and in general, the individuals who select into this sector could have been forced to do so or could be of the "low ability" type. If this was the case, one should not necessarily expect an earnings premium after migration.

2.2 Related Literature

This paper contributes to different strands of literature. Most of the research on immigrant self-employment has focused on separate analyses of the experiences of immigrants from particular countries of origin or ethnicities. Although insightful, the conclusions of these papers pertain only to the individual experiences of specific groups like the Mexican or the East Asian immigrants, but preclude a more general understanding of the phenomenon as a whole (Fairlie and Lofstrom, 2015). In this paper, I use data on immigrants from many countries and regions of the world, which facilitates a direct comparison of outcomes across groups. My work also relates to a nascent literature (e.g. Akee et al. (2013), Hendricks and Schoellman (2017), and Lessem and Sanders (2018)) that highlights the importance of pre-migration characteristics to

understand how immigrants perform abroad.

Most researchers have analyzed the role of home country self-employment experience through proxies or averages of the self-employment rates in the sending economies, and their research has yielded mixed results (Fairlie and Lofstrom (2015); Fairlie and Woodruff (2010); Fairlie and Meyer (1996); Yuengert (1995)). In contrast, I exploit individual-level data on immigrants' jobs before moving to the US. I use the two rounds of the NIS data which provide additional information about the labor market outcomes of immigrants after more years in the U.S., since some of the people interviewed in the first round were just arriving to the country by then, precluding an analysis of changes over time (the second round took place during a big financial crisis).

Several studies on immigrant entrepreneurship have compared the outcomes of immigrant business owners to those of the native-born population. It has been well documented that immigrants have higher rates of business creation than the native-born in developed economies like the United States, Canada, the United Kingdom, and Australia (Fairlie and Lofstrom, 2015)[6]. In the U.S., for example, the share of self-employment by immigrants grew from 6.8% in 1980 to 18.4% in 2010. In addition, the immigrant share of the labor force in 2012 was 16%, while their fraction of the population was around 14% (Immigrant Small Business Owners, 2012).

Other authors have analyzed different elements associated with what immigrants bring to

[6] One reason for this pattern could be immigrants' selection (Borjas, 1987). Other studies point to complementary explanations. Vandor and Franke (2016), using experimental evidence, suggest that cross-cultural experiences increase the ability to recognize entrepreneurial options by facilitating the use of knowledge gained internationally to identify arbitrage opportunities and creative recombination of products. Hunt (2011) finds that the impact of immigrants on the labor outcomes of the native-born differs by entry visa.

the host countries, but their focus has been on the impact on the wage/salaried markets. Less attention has been paid to the analysis of the consequences of immigrant self-employment. One dimension has been through studies of business and job creation. For example, Kerr and Kerr (2016) found that firms created by immigrants perform better than those created by the native-born relative to employment growth over three- and six-year horizons. Other research has suggested that there might exist displacement effects by immigrant entrepreneurs on the self-employment opportunities of the native-born (Fairlie and Meyer, 2003).

The impact of immigrant self-employment has also been analyzed through the indirect benefits obtained by the receiving countries as immigrants move up the ladder. There is evidence that self-employment has historically served as a route out of poverty for certain immigrant groups (Fairlie and Woodruff, 2007) and a faster way to ascend the income and wealth ladders than paid employment (Light, 1972). For example, Holtz-Eakin et al. (2000) found that upward mobility among low-income self-employed households is higher than upward mobility of salaried workers.

The topic of immigrant entrepreneurship intersects different fields. Studies in the sociology literature have shown that immigrants have used self-employment to circumvent some of the requirements that wage or salaried jobs entail, such as good English skills, the capacity of employers to assess foreign education, legal status, lack of networks, or discrimination (Sanders and Nee, 1996). Sowell (1981), for instance, found that self-employment was chosen by first-generation immigrants to achieve upward mobility, particularly in the case of Japanese and Jewish newcomers. In addition, there is evidence that the formation of ethnic enclaves around particular business activities allowed some immigrant groups to achieve considerable economic success via concentrated entrepreneurship (Kerr and Mandorff, 2015).

3. Data

3.1 New Immigrant Survey

I use data from the two waves of the New Immigrant Survey (NIS). The NIS is a nationally representative sample of immigrants to the United States who were granted legal permanent residency ("green cards") in 2003. The project has a panel structure and was conducted in two waves. In the first round, immigrants were interviewed between June of 2003 and June of 2004. A follow-up interview took place between June of 2007 and December of 2009. The first wave sampled 12,448 immigrants and 8,573 completed the questionnaires, for a response rate of 68.9% which is normal in this type of surveys[7]. The number of completed interviews during round two was 3,902, for a response rate of 46.1%[8]. Since the main goal of this paper is to analyze the role of home country work experience in US outcomes, I focus my attention on working age individuals who worked before migrating and for whom the specific sector of work is known. A full explanation of the sample selection can be found in Appendix A.

The NIS data are very useful for the purpose of this paper. First, the survey contains a rich set of immigrants' information regarding demographics and other characteristics. Contrary to other data sets, the NIS has data on the labor history of individuals prior to migrating. Specifically, it asked respondents to provide information about their first job after the age of 16 and the last job they had before moving to the US. While the full pre-migration work history was not reported for all immigrants (as some could have had more than two jobs), 48.26% of

[7] See Hersch (2008) for details on non-response rates of similar types of surveys.

[8] According to Jasso et al. (2017), the drop in the response rate was mainly due to the lack of cooperation by the USCIS to provide contact information of immigrants, the downturn of the economy in the years between waves, and an increase in anti-immigrant sentiments.

the sample did not change jobs, so their full pre-migration work history is known[9]. While imperfect, there is no other similar data set, to my knowledge, that provides any home country information on the labor market outcomes of immigrants from many countries. In addition, the NIS has postmigration labor market data on three US jobs. One characteristic of the NIS is that it is not representative of all immigrants. Specifically, it misses undocumented immigrants or temporary legal migrants and does not include data about individuals who did not migrate to the US. The results of this paper apply to the specific subset of legal permanent residents. On the other hand, the main advantage of the NIS is that it has information on pre-migration outcomes of immigrants, which data sets that are more representative of the migrant population do not have.

As mentioned above, the response rate in round two of the NIS was low. This drawback could reduce the precision of parameter estimates and the ability to make inferences, although it does not necessarily introduce bias (Jasso et al., 2017). To get a sense of the potential selection (on observable characteristics) of respondents and non-respondents, I estimated a Probit regression of the probability of participating in round two. The results (shown in Table 4) include all the variables used in the estimations and dummies for the types of visas immigrants had before becoming permanent residents. None of the main variables of interest have a statistically significant impact on the probability of responding in the second round. Only the variables related to immigrants who came to the U.S. under a refugee visa, Europeans, and people with children were significant, but not at the 1% level.

[9] To avoid excess wording, I use throughout the text the phrases "only self/paid employment" in the home country, with the understanding that I refer to the two reported pre-migration jobs available.

3.2 Legal Permanent Residents and Selection

As explained above, legal permanent residents (LPRs) are a particular type of legal immigrant. In the first part of this subsection, I describe the main characteristics of this migratory status based mostly on the information from the Annual Flow Report of Lawful Permanent Residents of the Department of Homeland Security (DHS, 2018). I then explain how LPRs may differ from the general population of immigrants in the U.S. to get a sense of the possible degree of selection of this group.

Legal permanent residents or "green card holders" are a subset of legal immigrants with permission to live and work indefinitely in any place in the U.S., own property, and attend schools and universities. LPRs are also allowed to join the Armed Forces and to apply for US citizenship under certain requirements. In contrast, other individuals can travel legally to the U.S. but with limitations to the amount of time they can stay in the country or the type of activities they can perform (e.g. foreign students enrolled in American colleges), precluding in many cases their integration to the US labor markets.

An individual can become a LPR through different channels. The most common ones include being sponsored by a close family member who is either a LPR or a US citizen, being sponsored by an employer for having certain skills, or being granted refugee or asylee status. Likewise, an individual could already be in the U.S. under a different visa and then apply and obtain LPR status or apply from abroad, obtain an immigrant visa, seek admission to the U.S., and become a LPR when admitted at a port of entry (also known as new arrival).

The EB-5 visa is one of the few options for immigrants willing to open a business in the US. It requires, among other things, to invest at least $1,000,000 and create a minimum of 10

full-time jobs in two years. If the investments are made in some rural areas or places with high unemployment rates, the minimum investment is $500,000. Around 7.1% of employment-based immigrant visas every year are made available to individuals with the purpose of opening businesses in the country. As an example, in the fiscal year of 2014 the US granted 8,773 of such visas, 7,616 or 87% of which went to citizens of mainland China (Seals, 2015). The EB-5 visa has been widely criticized since it is more restrictive than the immigrant entrepreneurship visa that other countries have. In addition, it does not necessarily lead to permanent residency or serves the purpose of promoting innovation. Many concerns have been raised regarding the EB-5 visa as a way to "buy" permanent residency in the U.S. in a fraudulent way[10].

Legal permanent residents are not representative of the population of immigrants in the US. Lessem and Sanders (2018) documented, using the full sample of immigrants in the 2003 Current Population Survey, that only 45% of all immigrants in the U.S. have attended college. In contrast, almost 60% of individuals in my sample came to the U.S. with at least thirteen years of schooling. Hendricks and Schoellman (2017) found evidence of immigrants' selection on education and wages by comparing their NIS sample to data from the 2004 American Community Survey. Likewise, they found that individuals from poor countries were more selected on these variables than immigrants from developed nations. With the caveat that LPRs are a selected group, it is worth mentioning that the role of pre-migration characteristics on post-migration outcomes is still an open question and so far, only the NIS data allows researchers to study the relationship between these two variables.

[10] See Funcheon (2019) for an example of a news article involving fraudulent claims related to the EB-5 visa involving Chinese citizens.

3.3 Descriptive Statistics

The main sample consists of 3,529 immigrants with pre- and post-migration information. Table 1 presents the distribution of job types held by immigrants before and after they came to the US. The fraction of individuals who worked as entrepreneurs in the U.S. is lower than the fraction that did in their home countries. For example, 6.9% of immigrants worked only in self-employment before moving to the U.S., compared to 4.2% who did after migrating. Likewise, while 8.1% of individuals came with work experience in both sectors, only 7.7% had both types of occupations in the US.

Table 2 shows the mean values in percentages of the main variables considered in the paper. Close to 88% of all immigrants (3,109 out of 3,529) worked only for wages in the US. The remaining 420 individuals worked in self-employment at some point but could have worked in the paid employment sector too[11]. The first three rows present the distribution of home country jobs by sector. A larger fraction of immigrants that chose entrepreneurship in the U.S. have home country self-employment experience compared to individuals working in paid employment after migration. 11.43% of entrepreneurs in the U.S. worked only in self-employment before moving and 12.38% did in both sectors. In contrast, only 6.27% of wage workers in the U.S. worked solely in self-employment and 7.49% did in both sectors before moving.

Two variables associated with immigrants' human capital are their education levels and their proficiency in the language spoken in the receiving country. As seen in Table 2, a higher fraction of individuals working in the paid employment sector in the U.S. have more than high

[11] I consider these two groups since the sub-samples of individuals working only in self-employment jobs after migration or in both sectors are small to include the two categories separately.

school education from their home countries, since 60.47% of them do compared to 50.48% of immigrants working in self-employment. Likewise, individuals who worked in paid employment after migration have, on average, better English skills than self-employed workers, since a larger fraction reports speaking and/or understanding the language well or very well.

The last four columns of Table 2 show the distribution of immigrants' regions of origin. Of the immigrants that only worked in the paid employment sector in the U.S., the highest fraction (around a third) were from Asian countries, while approximately 30% came from Latin America and the Caribbean. In the case of entrepreneurs, the majority came from either Latin America and the Caribbean (close to 40%) or "Western" countries/regions like Europe, Canada, or Oceania (26.90%).

Table 3 shows the average age and number of years since immigrants left their home countries broken down by the sub-samples for each US job. These are the two time-varying variables considered in the paper. The round one job corresponds to the 2003/2004 occupation whereas the round two job refers to the one reported in 2007 to 2009 when the second wave of the NIS was conducted. Some immigrants came to the U.S. before the first round took place; the category Pre-2003 job pertains to the occupations they had when they first came. The average age of immigrants in self-employment was higher in all jobs. Regarding years since migration, entrepreneurs came to the U.S. earlier than wage workers in all jobs.

Figure 1 shows the distribution of the visa types that people in the sample had before obtaining their green card. The visa type that the highest percentage of individuals in wage or salary occupations had prior to obtaining permanent residency was employment. This is not surprising since one path to get a green card is being sponsored by a firm through employment

preferences. In the case of individuals in self-employment, around a third came under a family-sponsored visa. A family visa does not restrict the type of occupation that a person may have (in terms of paid or self-employment), thus allowing immigrants to choose their preferred sector freely.

4. Econometric Framework

4.1 Sector Choice

To empirically analyze the probability that an immigrant *i* is self-employed in the U.S. at time *t*, I estimate probabilistic regressions of the general form below exploiting variation in the occupational choice decisions of individuals over time:

$$y_{it} = \beta_0 + \beta_1 D_{it}^{\text{se}} + \beta_2 D_{it}^{\text{se-pe}} + X_{it}'\gamma + \lambda_r + \lambda_t + \varepsilon_{it} \qquad (1)$$

where y_{it} equals one if the person works in self-employment and zero if in paid employment, D_{it}^{se} is a binary variable equal to one if the immigrant only worked in self-employment at home, D_{it}^{se-pe} is a dichotomous variable equal to one if the person worked in both paid and in self-employment before migrating, and $X_{it}^{'}$ is a vector of observable characteristics.

In $X_{it}^{'}$ I include age and its square, gender, the number of years since the person left their home country, a dummy for having a family visa prior to becoming a permanent resident, and an indicator for having children before moving to the United States. Additionally, I control for human capital in $X_{it}^{'}$ by including an indicator for having at least thirteen years of education obtained in the home country, and a binary variable for having good English skills[12]. I also include region fixed effects (λ_r) to account for variation in self-employment rates across

[12] Check Appendix B for the detailed definitions.

different parts of the world. Finally, I add time fixed effects (λ_t) to control for changes in other factors over time, like macroeconomic conditions. ε_{it} is an error term.

4.1 Identification and Selection-Corrected Earnings Regressions

The estimation of earnings regressions is challenging since individuals do not randomly choose their occupation. If agents endogenously decide to work in paid or in self-employment based on their comparative advantage in either activity, OLS earnings estimates would be biased due to non-random selection. One common way to deal with this problem is through the use of exclusion restrictions or variables that determine selection (in this case the probability of choosing self-employment in the U.S.) but not the outcome (here earnings) as in (Heckman, 1979)[13]. Another option is to include independent variables with a large support. Unfortunately, finding suitable instruments, exclusion restrictions, or large support variables is very difficult or impossible in practice. In this paper, I follow a novel procedure proposed by D'Haultfœuille et al. (2018) that does not require instruments, exclusion restrictions, or large support regressors, is distribution-free, and performs well in small samples. Identification is mainly based on the testable condition that selection becomes independent of the covariates for large values of the outcome.

I introduce here the main features of the estimation approach and the identifying assumptions. A more detailed explanation of the algorithm and model can be found in D'Haultfœuille et al. (2018) and D'Haultfœuille et al. (2013), from which this subsection is based. Let Y^* be the outcome of interest and $X = (X_1, X_2)$ a vector of covariates excluding the intercept. The researcher only observes D, $Y = DY^*$, and X, where D is the selection dummy.

[13] Alternatively, one can estimate earnings by maximum likelihood. Identification in such case relies on distributional assumptions about the error terms that do not necessarily hold or can be credibly tested.

The main interest is to estimate the average marginal effects of each variable in vector X_1 on Y^*. Thus, we can write the outcome equation as:

$$Y^* = X_1'\beta_1 + \varepsilon \qquad (2)$$

The objective is to identify and estimate β_1. To achieve this goal, the following two main assumptions are needed[14]:

Assumption 1 Homogeneous effect of X_1

For any $\tau \in (0, 1)$, the τ-*th* conditional quantile of ε satisfies:

$$Q_{\varepsilon|X}(\tau|X) = \beta_0(\tau) + X_2'\beta_2(\tau) \qquad (3)$$

Thus,

$$Q_{Y^*|X}(\tau|X) = X_1'\beta_1 + \beta_0(\tau) + X_2'\beta_2(\tau) \qquad (4)$$

so that β_1 is not a function of the quantile τ. Notice that the support of the elements in X_1 is not restricted, and can contain binary variables. In other words, this assumption requires that a subset of the explanatory variables has a homogeneous (quantile-independent) effect on earnings, as in the standard OLS case.

Assumption 2 Independence at infinity

There exists $h \in (0, 1]$ such that for all x ∈ Support(X),

$$\lim_{y\to\infty} P(D = 1 \,|X = x, Y^* = y) = h \qquad (5)$$

This assumption says that for large values of the outcome selection becomes independent of the covariates at infinity since h does not depend on x. The intuition is that, if selection is endogenous, it can be expected that the effect of the outcome on selection will dominate the

[14] An additional technical assumption about the tail and regularity of the residual is required. As explained by D'Haultfœuille et al. (2018), it is satisfied by most well-known distributions, in particular the logarithmic one used here for the log of earnings.

effect of the independent variables, for arbitrarily large values of the outcome. In this context, the outcome is an immigrant's earnings. The selection is the occupational choice made by the person: to work in paid or in self-employment. In other words, what the assumption requires is that there is a subset of individuals for which the income potential in one sector (say self-employment) could be so high, that it is earnings and not the other variables (education, age, gender, etc.) what drives the person to choose the sector.

Anecdotally, there are real-world examples of individuals that in principle were unlikely to be successful entrepreneurs based on their low levels of education or limited English proficiency, but were able to move from "rags to riches". It was their potential and not the other characteristics that influenced the sector selection, thus enabling the estimation of the casual effect of the explanatory variables. While the technical assumption is that income goes to infinity (and the analogy in my example of going from "rags to riches"), empirically, what the algorithm requires is for there to be enough individuals in the upper tail of the earnings distribution. Figure 2 shows the distribution of paid and self-employment log hourly earnings (in 2003 dollars). The distributions are clearly distinct, and it can be observed that there are individuals earning substantially more than the mean in both sectors.

D'Haultfœuille et al. (2018) prove that under the assumptions above, β_1 can be identified and the estimator is consistent and asymptotically normal. The authors show that these assumptions are testable since they imply that, for large quantile indices, the estimators of β_1 obtained using different quantile indices are very close. They construct a J-test to evaluate whether the conditions are met. Their algorithm is based on extremal quantile regressions, in which the optimal quantile is chosen to minimize both the variance and bias of the estimator.

I estimate different specifications of the earnings regressions in each sector *k*, where *k* is

either paid or self-employment. I consider the main factors included in the Probit regressions except the household variable associated with having children before migration. I estimate different models since the estimation approach allows the researcher to choose which variables belong to X_1 (are quantile-independent) and there is no theoretical reason behind the decision. Nevertheless, the J-test can be used to assess the validity of the different specifications.

For example, a model in which all of the independent variables have a homogeneous effect on the outcome can be written as:

$$log(w_{it}^k) = \beta_1^k bothse_i + \beta_2^k onese_i + \beta_3^k age_{it} + \beta_4^k age_{it}^2 + \beta_5^k male_{it} + \beta_6^k yrs_{it} + \beta_7^k yrs_{it}^2 + \beta_8^k eng_i + \beta_9^k ed_i + \beta_{10}^k famvisa_i + \beta_T'^k T + \beta_R'^k R_i + \varepsilon_{it}^k \quad (6)$$

To check the robustness of the results, I estimate three sets of models for earnings in each sector. The specifications differ in terms of the variables that are chosen to have a homogeneous effect on the outcome[15].

As shown by D'Haultfœuille et al. (2013), the extremal quantile approach can be applied to the identification of generalized Roy models. This includes the estimation of models in which individuals make decisions between sectors like the occupational choice model presented here, and the estimation of earnings regressions as specified above. It is worth mentioning that an implicit assumption associated with the independence at infinity condition is that there exist factors that could make an individual very attracted to or productive in one sector but not in the other. While it is possible that "high ability" individuals could be very productive in either occupation, previous work has found that there are characteristics that

[15] I also estimated additional specifications with different numbers of independent variables. The results were very similar.

could make an individual succeed in self-employment but not in paid employment and vice versa. For example, Hamilton et al. (2019), in a study of personality traits and entrepreneurship, found that entrepreneurs are different in multiple dimensions like socio-emotional skills. The authors found that conscientiousness is profitable in paid employment but costly in self-employment. While this trait (associated with paying attention to detail) may in principle be helpful to run a business, it has also been linked to lack of self-indulgence and aversion to ignoring rules, even if doing so could help improve business performance (as breaking rules and taking risks could lead to innovations and higher profits).

5. Results

5.1 Self-Employment Determinants

Table 5 presents the results of different models of pooled Probit regressions of self-employment in the U.S. The model shown in column (1) includes the two main variables of interest with no additional factors: the first one is a dummy equal to one if the immigrant only worked in self-employment before moving to the US. The second one is a dichotomous variable equal to one if the person worked in both paid and self-employment in their home country. The base category are individuals who only worked in the wage or salary sector before migrating. These variables are meant to capture different degrees of self-employment experience that a person can have from the home country. When included separately from any other regressors, the two variables are statistically significant in explaining self-employment in the US.

Although the experience variables are relevant when considered in isolation, it could be that their impact vanishes or reduces when including other factors that could influence entrepreneurship in the US. The specification in (2) in Table 5 considers a model in which, in

addition to foreign work experience, I control for age, gender, and years since the person left their home country (and their squares). Age is meant to account for differences in the propensity to become an entrepreneur over different stages of the life of an individual. Years since the person left the home country captures other factors associated with time in the US.

Years since migration is related to assimilation in terms of culture, acquisition of valuable human capital, and the development of networks. On the other hand, it could also serve as a proxy for asset accumulation or access to the financial resources necessary to open a firm. Both age and years since migration could have a non-linear impact on the probability of becoming an entrepreneur. For this reason, I include square terms to assess whether their impact is concave or not. The results in model (2) show that age does not have a statistically significant influence on the probability of self-employment. However, years since migration has a positive (and quadratic) impact on US self-employment as expected. The addition of these variables does not change the fact that home country experience is relevant at explaining entrepreneurship in the US.

A third specification adds, to the variables included in model (2), English skills and education. These variables measure two important dimensions related to an immigrant's human capital. Education has a statistically significant and negative coefficient as can be seen from model (3). This suggests that some immigrants could be choosing self-employment because they lack the skills or qualifications (like diplomas) required to obtain a salaried job. The positive and statistically significant role of pre-migration work experience remains.

Model (4) incorporates dummy variables of regions of origin to take into account differences in the probability of entrepreneurship based on where a person is from, as barriers to entering the self-employment sector may vary across regions. The specification also controls

for whether the individual had children prior to coming to the US. Relative to Asian immigrants (the base category), individuals from Latin America or the Caribbean, and Europe, Canada, or Oceania[16] are more likely to engage in self-employment in the US.

The last version, shown in model (5), controls for different periods of time to take into consideration any macroeconomic factors that could have changed over time and might affect individuals' occupational choices (recall that the second wave of the NIS took place during the big financial crisis). I also add a dichotomous variable for whether the immigrant had a family visa before obtaining a green card. The coefficient associated with this variable is positive and strongly significant. The impact of pre-migration work experience remains statistically significant and positive after controlling for a variety of different elements that have been found to be important in other studies of entrepreneurship.

The results from the last column in Table 5 illustrate that the impact of home country jobs is economically considerable. Relative to individuals who only worked in paid employment before moving, immigrants who were only entrepreneurs at home were around 6.8 percentage points more likely to be self-employed in the U.S., while individuals who worked in both sectors were approximately 4.7 percentage points more likely (the unconditional probability of self-employment in the U.S. was 11.9%). This could suggest that individuals may have acquired skills or preferences for self-employment not only by working in this sector but also by trying both types of occupations before moving. In addition, immigrants who left their home countries longer time ago, came with better English skills, and had a family visa before obtaining permanent residency were more likely to choose entrepreneurship in the US.

[16] Coefficients on these variables are not included in the table due to space constraints.

5.2 Post-Migration Earnings

A first examination of whether pre-migration work experience affects earnings in the U.S. is shown in Table 6, which contains the results of Ordinary Least Squares (OLS) earnings regressions of self-employment. Notice that the coefficients of entrepreneurship experience from the home country are all positive, but not statistically significant. The opposite sign is observed for pre-migration work experience in both sectors as the coefficient of the second variable is negative in all models. In general, a positive association between education and English skills on earnings is seen across specifications, although the effects are only significant for schooling.

Table 7 presents the results of OLS paid employment earnings regressions. A robust finding across all specifications is that having worked in the self-employment sector before moving to the U.S. is associated with lower paid employment earnings growth in the U.S. compared to people who only had pre-migration salaried jobs. In addition, age and the number of years since the person migrated impact wages/salaries in the form of an inverted U-shape. Likewise, having good English skills and higher levels of schooling positively influence earnings in the US. The regression in (5) controls for both period and region of origin fixed effects. Immigrants from Latin America or the Caribbean, European, and African countries tend to have lower wages than Asians (the base category)[17], as do individuals who had a family visa before getting a green card.

The OLS earnings regressions in Table 6 evince that foreign work experience does not have, in general, a statistically significant impact on self-employment earnings. However, both variables have a negative and very significant influence on paid employment earnings across

[17] The results are not shown in the table for space reasons.

the different specifications. The omitted category of pre-migration work experience are people who only worked in the wage sector. Hence the negative coefficients mean that individuals who worked in self-employment (either uniquely or at some point before migrating) earn less in paid employment relative to immigrants who were only salaried workers at home. The results from the OLS regressions, nevertheless, are naive in the sense that they ignore endogenous sector selection.

Table 8 shows the results of different models of self-employment earnings estimated through the extremal quantile approach. I present three specifications to test whether the qualitative conclusions hold if some coefficients are allowed to vary by quantile[18]. The specification in (1) only considers homogeneous effects of the pre-migration experience variables. In this case, both have a positive impact on earnings but only self-employment at home is statistically significant. A second model takes as independent all the variables except the ones associated with region and time effects. Interestingly, the significance and magnitude of the experience variables are very similar to those in model (1). Education, age, and gender are also significant and of the expected sign.

The last column in Table 8 corresponds to a model in which only the time effects vary by quantile. Now, the pre-migration work experience variables do not have a statistically significant impact on self-employment earnings. In addition, having more years of schooling carries a premium for entrepreneurial earnings. This was also the case in the OLS regressions, albeit the impact is stronger after controlling for endogenous selection both in terms of magnitude and degree of statistical significance. Despite influencing entry into self-

[18] I also estimated alternative models using fewer explanatory variables as in the case of the Probit and OLS regressions. The results were very similar.

employment (as seen by the results in Table 5), having a family visa does not entail an earnings premium.

Table 9 presents the results of different models of paid employment earnings. The first column shows that the home country work experience variables influence earnings negatively when considered in a model in which these are the only covariates with homogeneous effects. In the model in the second column the pre-migration variables do not impact earnings, while the other regressors have the expected effect: education and schooling have a positive and significant impact on earnings, and older, male, and more assimilated individuals enjoy higher incomes.

The last column of Table 9 shows the results of a specification in which only the period variables have a quantile-dependent effect. The findings of this model are very similar. The home country (self-employment) experience variable has a negative impact on US earnings as in the case of the OLS estimations, as well as a similar magnitude. Age and the number of years since the person left their home country have a positive and quadratic effect on earnings. Likewise, good English skills and more years of schooling impact wages positively, and the effects are stronger than in the OLS case.

5.3 Discussion

In summary, the results show that pre-migration work experience is a significant determinant of the occupational choices of legal permanent residents in the United States. However, work experience from the home country does not appear to significantly enhance earnings after migration. Previous research on self-employment has found that individuals that choose entrepreneurship may opt into this sector because of the non-pecuniary benefits associated with it (Hamilton, 2000; Hurst and Pugsley, 2011). It could be the case that

immigrants who had a business before coming to the U.S. may have developed a preference for working in self-employment and thus have a higher probability of choosing this sector after migrating. If home country occupation was only affecting an individual's preferences but not their income potential, then an impact on post-migration earnings should not be expected.

The findings of this paper could also be explained by the fact that immigrants may face difficulties exploiting their human capital in a host country. It is possible that immigrants' skills might not transfer perfectly after they move, since they could face barriers to entry (like licensing, discrimination, patents, or accreditation) precluding them from fully exploiting their potential in a new country. Likewise, skills acquired abroad may not be (as) valuable in the US. Hendricks and Schoellman (2017) using the NIS data, documented limitations to skills' transferability across borders. They found that most immigrants moved to lower-paying jobs in the U.S. relative to the occupations they had back in their countries of origin, which generally limited their post-migration earnings.

The paper's results are consistent with the possibility that immigrants working in self-employment could have been forced into this sector due to the lack of necessary skills demanded by salaried occupations or because they were of the "low ability" type. Recall that close to 40% of individuals in self-employment in my sample are from Latin America or the Caribbean. In this region of the world, self-employment is usually associated with the informal sector and the absence of options in paid employment for individuals with below average levels of schooling.

6. Conclusions

Immigrant entrepreneurship in the United States has increased substantially over the last four decades. In this paper, I studied the impact of pre-migration work experience of legal permanent residents in the U.S. on their post-migration labor market outcomes. Making use of a novel data set, I assessed whether home country paid and self-employment experience influence immigrants' occupational choices and earnings in the US. Most of the previous research has not analyzed the link between home and host country jobs of immigrants. To my knowledge, this is the first paper to study the relationship between home country self-employment experience and earnings of immigrants in the US.

I find that home country work experience is an important determinant of self-employment in the US. Pre-migration experience, in contrast, does not appear to enhance post-migration earnings considerably after controlling for sector selection. This could be due to an imperfect transferability of human capital across borders, the sorting of individuals into occupations in which they developed a preference from the home country but do not have a comparative advantage in terms of income potential, and/or selection of "low ability" agents into self-employment. Instead, variables associated with human capital like schooling and better English skills play a more relevant role in explaining earnings. Why exactly this is the case and how the results could be different for other immigrant groups (like the undocumented population) are questions left for future research.

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Tables and Figures

Table 1: Pre- and Post-Migration Jobs

	Home country job	**United States job**
Paid Employment	3,001	3,109
Fraction	0.850	0.881
Self-employment	243	148
Fraction	0.069	0.042
Paid and Self-employment	285	272
Fraction	0.081	0.077
Number of individuals	**3,529**	**3,529**

Notes: this table shows the type of job held by individuals before and after migrating to the US. The first row of each group corresponds to the number of immigrants. Calculations are my own based on data from the New Immigrant Survey (NIS).

Table 2: Descriptive Statistics

Variable	**P.E. in the US**	**S.E. in the US**	**All**
self-emp. before US	6.27	11.43	6.89
paid and self-emp. before US	7.49	12.38	8.08
paid emp. before US	86.24	76.19	85.03
more than 12 years of schooling before US	60.47	50.48	59.28
good English skills	57.86	53.33	57.33
male	59.54	62.38	59.88
had children before migrating to the US	40.75	41.90	40.89
from Latin America and the Caribbean	29.36	40.24	30.66
from Europe, Canada, and Oceania	21.84	26.90	22.44
from Asia	34.19	22.38	32.79
from other countries	14.60	10.48	14.11
Number of individuals	**3,109**	**420**	**3,529**

Notes: this table shows the mean values or percentages of the main variables used in the paper. The statistics are broken down for the sub-samples of individuals who worked only in paid employment in the U.S. (first column) and the ones who worked in self-employment at some point after migration (second column). See Appendix B for a description of each variable. Calculations are my own based on data from the New Immigrant Survey (NIS).

Table 3: Descriptive Statistics by Round

	Pre-2003 Job		**Round 1 Job**		**Round 2 Job**	
	P.E.	**S.E.**	**P.E.**	**S.E.**	**P.E.**	**S.E.**
years left home	3.18	4.05	7.44	12.83	10.93	13.38
age	30.62	32.98	37.02	40.75	41.84	42.95
N	**1,828**	**108**	**2,642**	**204**	**1,548**	**228**

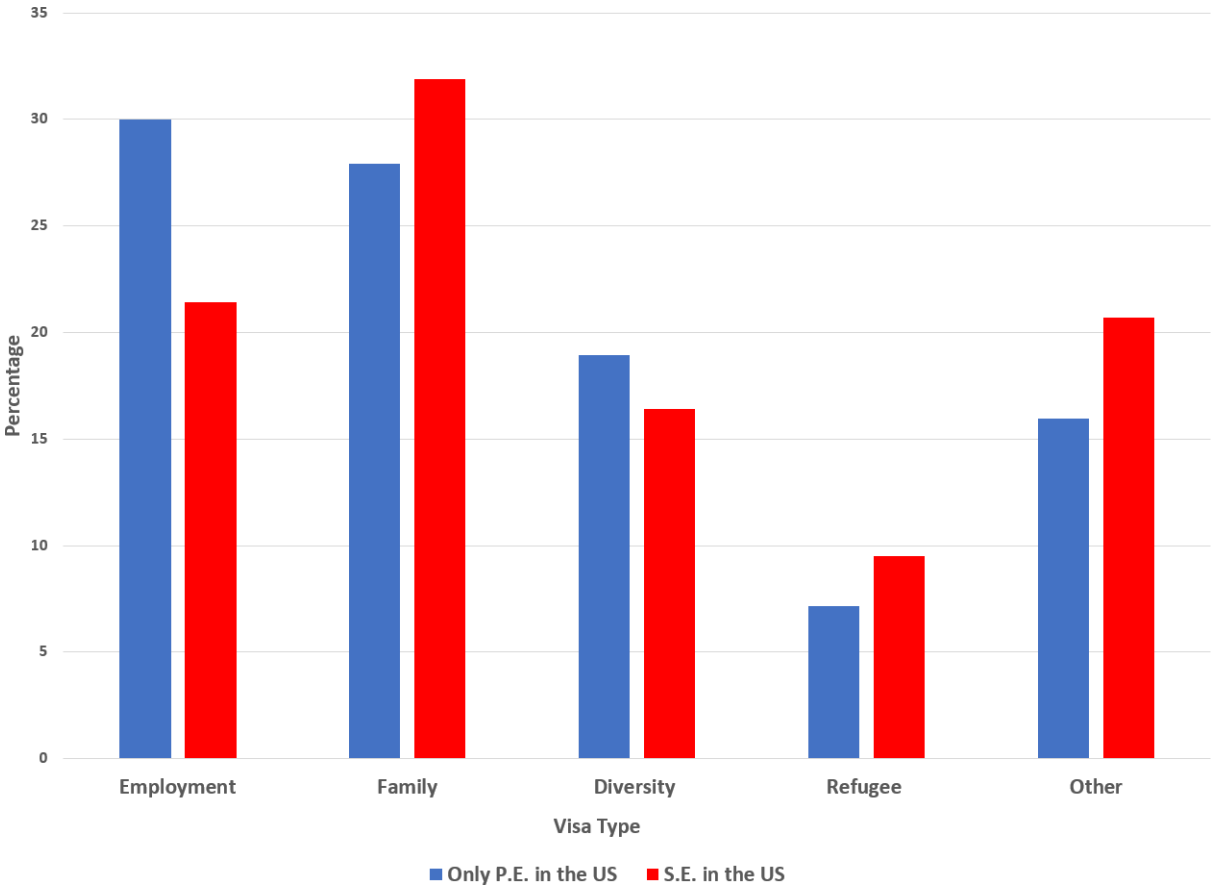
Notes: this table shows the mean values or percentages of the time-varying variables used in the paper. The statistics are broken down for the sub-samples of individuals who worked only in paid employment (P.E.) in the U.S. and the ones who worked in self-employment (S.E.) at some point after migration. See Appendix B for a description of each variable. Calculations are my own based on data from the New Immigrant Survey (NIS).

Table 4: Probit Regression of Round Two Participation

	Marginal Effects
only self-emp. before US	0.0150
	(0.0385)
paid and self-emp. before US	0.0219
	(0.0347)
age	-0.000454
	(0.00138)
years left home	0.00162
	(0.00144)
male	-0.0311
	(0.0198)
good English	-0.00326
	(0.0232)
more 12 years educ. home	0.0167
	(0.0222)
European	0.0569**
	(0.0282)
African	0.0409
	(0.0355)
Latino	0.0265
	(0.0285)
had children before mig.	0.0552**
	(0.0249)
family visa	-0.0358
	(0.0310)
employment visa	0.0360
	(0.0338)
diversity visa	0.0180
	(0.0405)
refugee visa	-0.0928**
	(0.0422)
N	2,845

Notes: the dependent variable is a dummy equal to one if an individual in the round one sample was also part of the round two sample, and 0 if an individual was in the first round sample but not in the second one. Coefficients correspond to marginal effects. Standard errors in parentheses. See Appendix B for a description of each variable. Calculations are my own based on data from the New Immigrant Survey (NIS). Asians are the base category for regions and other visas for visa types. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

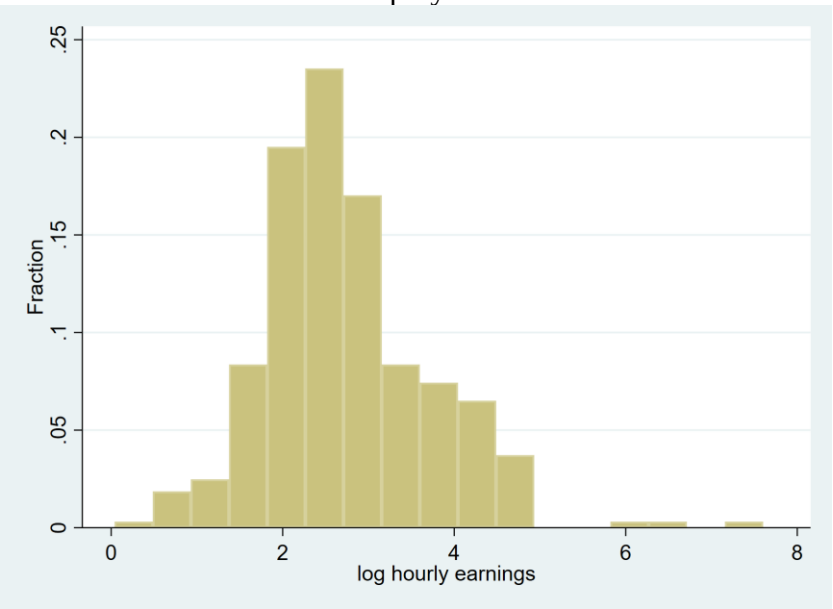
Figure 1: Immigrant Self-Employment by Visa Type



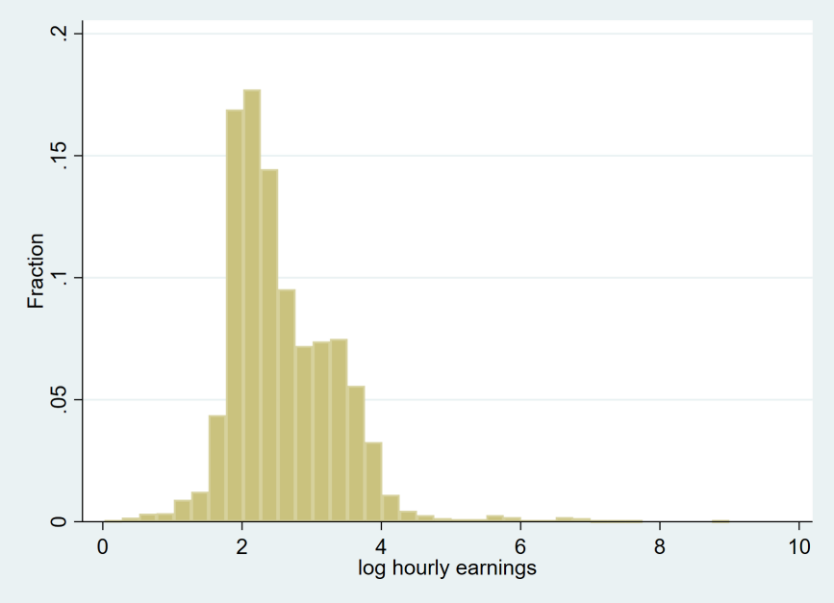
Notes: this figure shows the distribution of visas immigrants had prior to obtaining legal permanent residency by the type of job held in the US. Employment includes employment preference visas. Family includes spouses, children or parents of US citizens, spouses of permanent residents, or family fourth preference visas. Refugee includes refugees, asylees, or parolees. Other includes legalization and any other type of visa (except diversity). Calculations are my own based on data from the New Immigrant Survey (NIS).

Figure 2: Log Hourly Earnings Distributions

Self-Employment



Paid Employment



Notes: the figures above show the distribution of log hourly earnings in 2003 US dollars of post-migration jobs calculated from NIS data. The top panel corresponds to self-employment and the bottom panel to paid employment. The sample is restricted to individuals earning at least $1 an hour.

Table 5: Determinants of Immigrant US Self-Employment

	(1)	(2)	(3)	(4)	(5)
only self-emp. before US	0.0831***	0.0773***	0.0659***	0.0704***	0.0681***
	(0.0176)	(0.0172)	(0.0166)	(0.0169)	(0.0166)
paid and self-emp. before US	0.0622***	0.0554***	0.0510***	0.0494***	0.0470***
	(0.0156)	(0.0153)	(0.0149)	(0.0148)	(0.0146)
age/10		0.0206	0.0307	0.0391	0.0621**
		(0.0235)	(0.0235)	(0.0240)	(0.0248)
age sq./100		-0.000986	-0.00230	-0.00320	-0.00607**
		(0.00285)	(0.00285)	(0.00286)	(0.00293)
years left home/10		0.0809***	0.0787***	0.0724***	0.0750***
		(0.00976)	(0.00983)	(0.0103)	(0.0111)
years left home sq./100		-0.0153***	-0.0146***	-0.0134***	-0.0139***
		(0.00277)	(0.00278)	(0.00279)	(0.00298)
male		-0.00348	-0.00184	-0.000456	0.00311
		(0.00692)	(0.00690)	(0.00689)	(0.00686)
good English			-0.0103	-0.00190	-0.00175
			(0.00766)	(0.00780)	(0.00781)
more 12 years educ. home			-0.0209***	-0.0161**	-0.0150*
			(0.00765)	(0.00778)	(0.00772)
had children before mig.				0.00336	0.00369
				(0.00871)	(0.00872)
family visa					0.0224***
					(0.00824)
region of origin controls	NO	NO	NO	YES	YES
time fixed effects	NO	NO	NO	NO	YES
N	6,753	6,558	6,558	6,558	6,558

Notes: this table shows the results of pooled Probit regressions of immigrant entrepreneurship. The dependent variable is a dummy equal to one if the person worked in self-employment and zero if in paid employment. Standard errors in parentheses. See Appendix B for a description of each variable. Calculations are my own based on data from the New Immigrant Survey (NIS). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Estimates correspond to marginal effects. Asians are the base category for regions.

Table 6: Pooled OLS Earnings Regressions: Self-Employment

	(1)	(2)	(3)	(4)	(5)
only self-emp. before US	0.00906	0.0887	0.122	0.143	0.154
	(0.177)	(0.172)	(0.169)	(0.172)	(0.172)
paid and self-emp. before US	-0.117	-0.265	-0.212	-0.190	-0.164
	(0.177)	(0.180)	(0.178)	(0.182)	(0.183)
age/10		0.998***	0.803**	0.812**	0.611
		(0.352)	(0.355)	(0.359)	(0.371)
age sq./100		-0.124***	-0.103**	-0.104**	-0.0845*
		(0.0420)	(0.0419)	(0.0423)	(0.0432)
years left home/10		0.229	0.294*	0.305*	0.0878
		(0.156)	(0.159)	(0.164)	(0.180)
years left home sq./100		-0.0313	-0.0469	-0.0513	-0.00551
		(0.0411)	(0.0411)	(0.0423)	(0.0451)
male		0.430***	0.353***	0.348***	0.324***
		(0.110)	(0.111)	(0.112)	(0.111)
good English			0.158	0.146	0.177
			(0.115)	(0.121)	(0.121)
more 12 years educ. home			0.291**	0.282**	0.276**
			(0.116)	(0.124)	(0.123)
family visa					-0.0666
					(0.114)
region of origin controls	NO	NO	NO	YES	YES
time fixed effects	NO	NO	NO	NO	YES
constant	2.732***	0.412	0.597	0.551	0.816
	(0.0610)	(0.687)	(0.688)	(0.736)	(0.748)
N	330	323	323	323	323

Notes: standard errors in parentheses. See Appendix B for a description of each variable. Calculations are my own based on data from the New Immigrant Survey (NIS). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Asians are the base category for regions.

Table 7: Pooled OLS Earnings Regressions: Paid Employment

	(1)	(2)	(3)	(4)	(5)
only self-emp. before US	-0.413***	-0.425***	-0.182***	-0.143***	-0.135***
	(0.0471)	(0.0456)	(0.0422)	(0.0413)	(0.0409)
paid and self-emp. before US	-0.146***	-0.147***	-0.0379	-0.0282	-0.0100
	(0.0422)	(0.0410)	(0.0375)	(0.0366)	(0.0362)
age/10		0.896***	0.702***	0.652***	0.530***
		(0.0749)	(0.0689)	(0.0677)	(0.0694)
age sq./100		-0.117***	-0.0867***	-0.0833***	-0.0692***
		(0.00936)	(0.00860)	(0.00844)	(0.00861)
years left home/10		0.325***	0.320***	0.355***	0.302***
		(0.0322)	(0.0298)	(0.0295)	(0.0311)
years left home sq./100		-0.0579***	-0.0656***	-0.0695***	-0.0587***
		(0.00983)	(0.00901)	(0.00885)	(0.00910)
male		0.217***	0.210***	0.225***	0.212***
		(0.0221)	(0.0201)	(0.0197)	(0.0198)
good English			0.444***	0.405***	0.415***
			(0.0224)	(0.0227)	(0.0227)
more 12 years educ. home			0.357***	0.296***	0.280***
			(0.0223)	(0.0225)	(0.0223)
family visa					-0.195***
					(0.0229)
region of origin controls	NO	NO	NO	YES	YES
time fixed effects	NO	NO	NO	NO	YES
constant	2.618***	0.721***	0.499***	0.817***	1.003***
	(0.0120)	(0.141)	(0.129)	(0.130)	(0.136)
N	5,025	4,901	4,901	4,901	4,901

Notes: standard errors in parentheses. See Appendix B for a description of each variable. Calculations are my own based on data from the New Immigrant Survey (NIS). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Asians are the base category for regions.

Table 8: Extremal Quantile Earnings Regressions: Self-Employment

Variable/Model	(1)	(2)	(3)
only self-emp. before US	0.6400**	0.6400*	0.5626
	(0.3203)	(0.3619)	(0.3495)
paid and self-emp. before US	0.0214	0.0214	-0.0414
	(0.2234)	(0.2345)	(0.2535)
age/10		0.9178**	0.7864
		(0.4685)	(0.5301)
age sq./100		-0.1367**	-0.1250**
		(0.0567)	(0.0624)
years left home/10		0.1659	0.2439
		(0.2736)	(0.2772)
years left home sq./100		-0.0186	-0.0322
		(0.0746)	(0.0737)
male		0.3136**	0.3339**
		(0.1567)	(0.1564)
good English		0.1318	0.0870
		(0.1664)	(0.1916)
more 12 years educ. Home		0.3556**	0.4443***
		(0.1550)	(0.1510)
family visa		-0.0901	-0.1360
		(0.1383)	(0.1520)
region of origin controls	YES	YES	YES
time fixed effects	YES	YES	YES
J-test (p-value)	0.5365	0.4553	0.6514
N	323	323	323

Notes: the dependent variable is log hourly earnings in 2003 US dollars. The covariates shown under each model correspond to the variables that are quantile-independent (except in the case of time fixed effects). Standard errors in parentheses. See Appendix B for a description of each variable. Calculations are my own based on data from the New Immigrant Survey (NIS).
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Asians are the base category for regions.

Table 9: Extremal Quantile Earnings Regressions: Paid Employment

Variable/Model	(1)	(2)	(3)
only self-emp. before US	-0.1011**	-0.0657	-0.1342**
	(0.0453)	(0.0459)	(0.0628)
paid and self-emp. before US	-0.0025	0.0397	0.0641
	(0.0424)	(0.0424)	(0.0722)
age/10		0.5269***	0.5796***
		(0.0780)	(0.1553)
age sq./100		-0.0681***	-0.0722***
		(0.0091)	(0.0188)
years left home/10		0.3527***	0.2447***
		(0.0444)	(0.0671)
years left home sq./100		-0.0622***	-0.0319**
		(0.0138)	(0.0191)
male		0.2292***	0.2750***
		(0.0181)	(0.0335)
good English		0.5113***	0.5515***
		(0.0443)	(0.0511)
more 12 years educ. home		0.3988***	0.4086***
		(0.0410)	(0.0509)
family visa		-0.1744***	0.2113***
		(0.0252)	(0.0471)
region of origin controls	YES	YES	YES
time fixed effects	YES	YES	YES
J-test (p-value)	0.5365	0.4553	0.6514
N	323	323	323

Notes: the dependent variable is log hourly earnings in 2003 US dollars. The covariates shown under each model correspond to the variables that are quantile-independent (except in the case of time fixed effects). Standard errors in parentheses. See Appendix B for a description of each variable. Calculations are my own based on data from the New Immigrant Survey (NIS).

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Asians are the base category for regions.

Appendix A Sample Selection

The New Immigrant Survey (NIS) was conducted in two waves. The first round took place between 2003 and 2004 and sampled immigrants obtaining legal permanent residency in those years, their spouses, and some of their children. A subsequent round was done between 2007 and 2009. This paper uses information on the sample of main immigrants. The NIS intended to interview around 12,500 main immigrants and had a success rate of approximately 68.6% since 8,573 individuals participated in the first wave.

From the initial sample of 8,573 immigrants, one observation is lost as the number of years of education reported is not valid. 40 additional individuals are dropped since age information was not provided. Two persons do not have data on country or region of origin and hence are discarded. 26 additional observations are lost due to missing information on schooling. Since the main goal of this paper is to analyze the role of pre-migration labor market experience, I only consider people who worked at some point before migrating to the US. This results in a loss of 3,449 observations.

After keeping the sample with home country labor market outcomes (5,055 people), I discard individuals with missing information on sector of employment (before and after migrating), English skills, and year when they left the home country. In addition, I do not include individuals with inconsistent job start dates or who reported working in a country other than the U.S. after moving. Furthermore, I perform the analyses on working age individuals (18 to 65 years old). The restrictions above result in a sample of 3,529 persons.

Appendix B Variable Descriptions

This section presents the definitions and construction of the variables used in the estimations. The data are from the New Immigrant Survey (NIS).

Age measured in years and divided by 10 in the estimations. The analyses are restricted to individuals between 18 and 65 years old.

English skills Good English is a dummy equal to one if at least one of the following two possibilities is met:

1. The individual answered no to the question: have you ever spoken any language other than English?
2. The individual answered very well or well to the questions: how well do you understand spoken English?, and, how well would you say you speak English?

The variable is equal to 0 if the answers to the questions in two were not well or not at all.

English questions were only asked in the NIS at the time of the 2003/2004 survey. For this reason, the level of English proficiency is assumed to be constant across the different job spells. Arguably, one would expect changes to English skills over time. The changes would probably be less pronounced between the first and the second round jobs than between the first job after migration and any round job (if the person came to the U.S. long time ago), since the maximum number of years between the two rounds is six. In addition, one would expect immigrants to have better or equal English skills in 2007/2009, after living more time in the US.

Visa types The public-use NIS data set contains information on the broad categories of visas through which immigrants later became legal permanent residents. Each category corresponds to a grouping made by the NIS based on the more disaggregated visa information provided to

them by the U.S. Citizenship and Immigration Services (USCIS) formerly the Immigration and Naturalization Service (INS). The broad categories are:

1. Other
2. Spouse of US citizen
3. Spouse of legal permanent resident
4. Parent of US citizen
5. Child of US citizen
6. Family fourth preference
7. Employment preferences
8. Diversity immigrants
9. Refugee/asylee/parolee
10. Legalization

In the paper, I pool some of these categories and work with the following classification:

a. **Family visas**: includes 2 to 6 above
b. **Employment visas**: includes 7 above
c. **Diversity visas**: includes 8 above
d. **Refugee visas**: includes 9 above
e. **Other visas**: includes 1 and 10 above

Family visa In my analyses, I include a dummy variable equal to one if the person had a family visa before becoming a legal permanent resident, and equal to zero if otherwise.

Self-employment in the U.S. Dummies for self-employment at the different US jobs are defined as follows. Each variable takes the value of one if the individual indicated to be self-employed and of zero if the answer was "working for someone else".

Only self-emp. before U.S. Is a dummy equal to one if the immigrant only worked in self-employment before moving to the U.S. and zero otherwise.

Paid and self-emp. before U.S. Is an indicator variable equal to one if the immigrant worked in self-employment and in paid employment jobs before moving to the US.

Countries and regions In the public-use NIS data set the country of origin of most immigrants is disclosed, except for countries with very low numbers of individuals. For this subset, only the region of origin is known. The countries included are: Canada, China, Colombia, Cuba, Dominican Republic, El Salvador, Ethiopia, Guatemala, Haiti, India, Jamaica, Korea, Mexico, Nigeria, Peru, Philippines, Poland, Russia, Ukraine, United Kingdom, and Vietnam.

Individuals from other countries (with low legal migration rates to the U.S.) are classified by the NIS in one of the following categories: Europe and Central Asia; East Asia, South Asia, and the Pacific; Other North America; Latin America and the Caribbean; African Sub-Saharan; Middle East and North Africa; Oceania; and the Artic Region. I group countries into the four regions defined below:

a. **Europe, Canada, and Oceania:** includes Canada, Poland, Russia, Ukraine, United Kingdom, other countries in Europe and Central Asia, other in North America, and Oceania

b. **Latin America and the Caribbean:** includes Colombia, Cuba, Dominican Republic, El Salvador, Guatemala, Haiti, Jamaica, Mexico, Peru, and any other country in this region

c. **Asia**: includes China, India, Korea, Philippines, Vietnam, and other countries in East and South Asia and the Pacific

d. **Other**: includes Ethiopia, Nigeria, and African Sub-Saharan, Middle Eastern and North African countries, and the Artic Region

Education abroad This is a dummy variable equal to one if the individual completed at least 13 years of education before moving to the U.S. and 0 otherwise.

Had children before moving This is a dummy variable equal to one if the immigrant had biological children before moving to the U.S. and 0 otherwise.

Years since left the home country This variable is defined as the difference between the year

the immigrant was interviewed (or the year they first worked after moving if asked about the first job in retrospective) and the year the person said to have left their country of birth to live in another country for at least 60 days. Close to 86% of all immigrants in the round one sample said they moved to the United States. The variable is measured in years and divided by 10 in the estimations.

Earnings Earnings in the three US jobs considered in the paper (first after migration, first round, and second round job) are constructed as follows. First, I only keep earnings observations when individuals reported the location of their job to be the US. Second, I make use of the NIS-provided PPP earnings variables in current prices. Third, I convert all data to 2003 US dollars using CPI series from the FRED database of the St. Louis Fed[19].

The NIS allowed immigrants to report their income with a high degree of flexibility. Individuals were given the option to indicate their earnings in their preferred currency and unit of time (hour, week, every two weeks, month, year, or other). They were also asked about the number of weeks in a year that they worked at a job and the usual number of weekly hours worked at that job. In the case of individuals in self-employment, the NIS asked about their earnings in their main job and their profits separately. With the information above, I constructed hourly earnings for every individual and applied the natural logarithm for the values used in the earnings regressions.

[19] Available online at: https://fred.stlouisfed.org/categories/9