Political Forces and Temporary Labor Migration in the Era of Globalization

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Chapter Outline

Chapter 1

Introduction

Understanding why and how political forces shape the three main pillars of economic globalization, i.e., cross-border flows of goods, capital, and people, is central to the study of International Political Economy (IPE) (Lake 2008). Existing literature in trade distinguishes between the causes and consequences of trade in intermediate and final goods.[1] Similarly, the literature in finance distinguishes between causes and consequences of short-term portfolio investment and long-term Foreign Direct Investment (FDI).[2]

Yet, extant IPE literature in migration has focused on the causes and consequences of permanent migration—immigration for citizenship or permanent resident purposes—and overlooked *temporary* migration.[3] This is despite the phenomenon of temporary migration tracing back to premodern societies when people move temporarily for social visits, farming, or religious observance (Zelinsky 1971). It is also despite international migration in the current era consisting more of temporary labor market-driven migration than permanent immigration. For example, Figure 1.1 shows how temporary migration to Organisation for Economic Co-operation and Development (OECD) countries exceeds permanent migration every year in which OECD data is available.[4] Furthermore, the literature suggests that temporary migration is even more prevalent in South-South migration (Crush, Anich, Melde,

[1] See for example, Milner (1989), Gilligan (1997), Feenstra (1998), Hummels, Ishii, and Yi (2001), Helpman (2006), and Kim (2013) on the implications of growing intra-industry trade and intermediate goods.

[2] See Quinn and Inclan (1997), Bernhard and Leblang (1999), Leblang and Bernhard (2000), Bernhard, Broz, and Clark (2002), Quinn and Toyoda (2007), Pepinsky (2008), and Guisinger and Singer (2010) for research focused on the former. See Henisz (2000), Li and Resnick (2003), Jensen (2003), Pinto and Pinto (2008), and Pandya (2010) for research focused on the latter.

[3] See for example Scheve and Slaughter (2001), Mayda (2006), O'Rourke and Sinnott (2006), Hainmueller and Hiscox (2007), Hanson (2009), Hainmueller and Hiscox (2010), Freeman, Hansen, and Leal (2013), Fitzgerald, Leblang, and Teets (2014), Hainmueller and Hopkins (2014b), and Hopkins (2014).

[4] Temporary migrants in the figure include temporary labor migrants and international students while excluding tourists. Permanent migrants include those who move for family reunification, permanent work, and asylum purposes.

and Oucho 2014:10). Overall, this implies that the extant literature's focus on permanent immigration misses *at least* half of the flows within the global phenomenon of international migration. How do political forces shape temporary migration? To what extent and why? What are the implications for the existing literature?

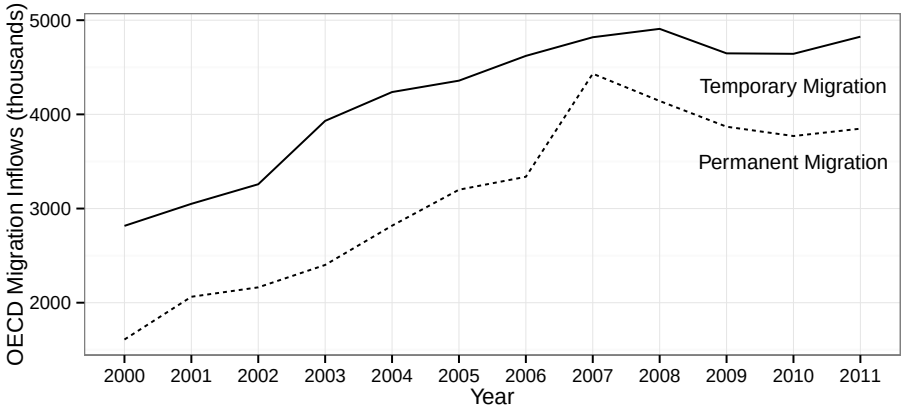

Fig 1.1. Migration Flows to OECD Countries: Temporary vs. Permanent.

My dissertation addresses this gap in the literature. In the ensuing chapters, I develop and test observable implications of how Multinational Corporations (MNCs) shape temporary migration policymaking with bureaucratic lobbying, and how states shape temporary migration flows with visa regulations and bilateral labor agreements. To overcome well-known challenges of sparse migration data, I compile a large and original data set that combines firm-level data on all approved intra-company transfers to the United States, firms' financial and lobbying information, and country-specific visa regulations firms face from 2000 to 2013. Leveraging the data set, I show that firms are both effective and strategic in their target venue when lobbying on visa regulations for high-skilled temporary migrants. This is despite persistent and general public opposition to immigration and deadlocks in immigration reform. In contrast, the effectiveness of migration policies states employ is mixed. I find that more relaxed bilateral visa regulations play a direct role in facilitating the mobility of high-skilled MNC professionals. However, exploiting unique data on Overseas Filipino Workers (OFW) and Philippine Bilateral Labor Agreements (BLA), I find that bilateral labor agreements designed to promote mobility and worker rights reduce the mobility of low-skilled migrant workers who would have benefited the most.

Overall, the dissertation makes three main contributions to the literature. First, it contributes to emerging research that demonstrates the importance of *firms* and their preferences in immigration policy formation.[5] This challenges the common focus on individual

[5]See for example, Peters (2014) who examines firms and low-skilled immigration policy formation.

and public attitudes in the extant immigration literature. Similar to theories of policy formation in other economic issue areas, there are two main potential domestic explanations for immigration policy outcomes: public attitudes and interest groups (Freeman and Tendler 2012:1). The majority of the literature, however, has focused on studying the formation of public attitudes (Scheve and Slaughter 2001; Mayda 2006; Hainmueller and Hiscox 2007; Brader, Valentino, and Suhay 2008; Hainmueller and Hiscox 2010; Dancygier and Donnelly 2013; Freeman, Hansen, and Leal 2013; Malhotra, Margalit, and Mo 2013; Hainmueller and Hopkins 2014b; Hopkins 2014). I argue that this tendency is in part due to the missing distinction between temporary and permanent migration—the two imply very different relevant actors, preferences, and political dynamics in migration policymaking. For example, permanent migration has larger political implications on voters in receiving countries than temporary migration. In contrast, temporary migration has larger economic implications on firms—key employers of temporary labor migrants—than permanent migration. Naturally, the extant literature's focus on permanent migration leads to the prioritizing of voters while overlooking the role of firms. This orientation thus gives primacy to median voter models (Downs 1957) and the power of the legislature when explaining migration policy outcomes. By focusing on temporary migration, the dissertation overcomes this weakness in the literature. It builds on a growing literature that show the influence of organized interest groups in immigration policy formation (Freeman 1995; Amegashie 2004; Facchini and Mayda 2009; Facchini, Mayda, and Mishra 2011; Freeman and Tendler 2012), but further distinguishes itself by focusing on the role of multinational firms and their influence through bureaucracies.

The distinction between permanent and temporary migration also has important implications for attitudinal research in migration. If permanent migration faces more public opposition in receiving countries than temporary migration, and the latter exceeds the former in magnitude, then assuming or framing migration as permanent may have lead to more negative findings of attitudes towards migration than would otherwise exist. An important puzzle in extant literature is understanding why immigration policies are systematically more open than public attitudes appear to prefer. For example, Freeman and Tendler (2012:1) point to a large literature that finds "a frequent disjuncture between hostile publics and more receptive governments." Hainmueller and Hopkins (2014a:244) acknowledge that public attitudes on immigration clarify this puzzle but can not answer it alone. The dissertation's focus on temporary migration and its findings about the influence of multinational firms thus provides a first step towards addressing this important puzzle.

Second, it contributes to the emerging field of migration and development.[6] High-skilled

[6]See for example, Kapur and McHale (2005), Pritchett (2006), Docquier and Rapoport (2012), and Clemens, Özden, and Rapoport (2014).

migrants are critical to national economies. These migrants hold skills and knowledge capital that are well known to promote the productivity of individuals, firms, and industries, and the economic growth of countries (Romer 1993; Grossman and Helpman 1990; Grossman and Helpman 1993; Peri 2012; Hausmann 2013). As a result, receiving countries increasingly adopt immigration policies aimed at attracting high-skilled migrants (Docquier and Machado 2015). Meanwhile, sending countries, concerned about "brain drain" (Docquier and Rapoport 2012), try to either retain or encourage the return of high-skilled migrants with diaspora engagement policies (Gamlen 2008; Agunias and Newland 2012; Leblang 2014). Yet despite the importance of high-skilled migrants in the global economy, we still know little about the extent states, as political actors, shape developmental patterns in both receiving and sending countries through migration policies. Furthermore, it is unclear why some high-skilled migrant workers are more mobile than others. The dissertation's analysis using an original data set on temporary high-skilled MNC intra-company transfers and country-specific visa regulations sheds light on these issues. It offers a first step towards evaluating the developmental impact of migration policies through regulating the mobility of skilled workers who hold firm-specific knowledge. It also draws attention to the role of large multinational firms currently missing within studies on the migration-development nexus.

Third, it contributes to the literature on the effects of international institutions and transnational exchange. Since Keohane (1984)'s seminal work, the premise that international institutions promote cross-border economic integration by mitigating problems with market failures is central to theories of International Relations. While supportive evidence has been found in issue areas such as trade (Goldstein, Rivers, and Tomz 2007; Mansfield and Reinhardt 2008) and capital flows (Elkins, Guzman, and Simmons 2006; Büthe and Milner 2008; Büthe and Milner 2014), systematic evidence from migration has so far been rare. The dissertation's findings using data on temporary overseas Filipino workers suggest a more complicated picture: the existence of bilateral labor agreements is associated with lower mobility for low-skilled temporary workers and higher mobility for high-skilled temporary workers. I argue that this is because formal international agreements that solve labor market failures between countries actually increase transaction costs for migrant workers. The mobility of migrant workers thus depends on their ability to overcome such costs. The findings call attention to more research on gaps between international institutional design and effect.

The ensuing chapters are briefly summarized as follows. In chapter 2, the dissertation examines how firms shape high-skilled migration policy formation. The flow of people across borders is the most politically charged and regulated phenomenon in globalization. Yet,

the formation of immigration policies that regulate it is still poorly understood. Extant studies on immigration focus mainly on the formation of public attitudes and implicitly assume attitudes explain immigration policy outcomes. However, a large literature finds that immigration policies are systematically more open than the public appears to prefer. Focusing on U.S. visa regulations on intra-company transfers by MNCs, the dissertation argues that firms shape the *implementation* of immigration laws through bureaucratic lobbying despite public attitudes setting immigration laws in the legislature. To test the argument, the dissertation compiles an original data set that combines firm-level data on all approved intra-company transfers to the U.S. by MNCs, firm's financial and lobbying information, and country-specific visa regulations firms face from 2000 to 2013. The dissertation shows that firms are both effective and strategic when lobbying on visa regulations. However, collective action problems still undermine firms' lobbying. More broadly, the findings challenge the common focus on individual and public attitudes in the immigration literature.

In chapter 3, the dissertation examines how states shape high-skilled mobility and knowledge transfers with visa regulations. Knowledge capital is crucial for productivity and economic growth. Yet, despite its role in economic development, extant literature has treated the flow of knowledge across borders as a black box: assuming knowledge transfers whenever trade or FDI flows are present. The dissertation argues that the mobility of MNC professionals through Intra-Company Transfers (ICT) provide a more precise measure of cross-border knowledge transfers. Furthermore, states can shape the magnitude and direction of knowledge transfers by varying common visa regulations on these high-skilled workers. To test the argument, the dissertation employs an original dataset on U.S. visa regulations on intra-company transfers for 170 partner countries from 2000 to 2013 compiled using web scraping techniques. Exploiting cross-dyad and temporal variation in visa regulations and immigration admissions, the dissertation shows that MNC professionals enter the U.S. more frequently from countries given more relaxed visa regulations even when adjusting for various confounders. Furthermore, the recent surge of Indian intra-company transfers to the U.S. is linked to more relaxed country-specific visa regulations in 2006. The findings challenge the common focus on the effect of permanent immigration policy in the literature.

In chapter 4, the dissertation examines the consequences of bilateral labor agreements on the mobility of temporary migrant workers. To what extent do bilateral labor agreements facilitate cross-border labor mobility? These agreements have been recently touted as an example of formal international cooperation that contributes to "triple-win"—migrants, receiving countries, and sending countries all benefit from resulting higher cross-border labor mobility while governments minimize political costs. Yet, few studies offer systematic evidence linking international agreements and higher cross-border labor mobility. The disserta-

tion argues that bilateral agreements on labor are unique in which they help solve state-level market failures by shifting costs to migrant workers and employers. As a result, labor mobility depends on the workers ability to overcome such agreement-induced costs, and with low-skilled workers at a disadvantage. This contrasts how Preferential Trade Agreements (PTAs) or Bilateral Investment Treaties (BITs) solve market failures, reduce transaction costs, and promote cross-border flows of goods or capital. Employing a unique skill-level data set on overseas Filipino workers, the dissertation finds, consistent with the argument, that mobility for low-skilled (high-skilled) workers is lower (higher) when bilateral labor agreements are signed. The findings contribute to the emerging literature on how formal international cooperation regulates international migration and research on gaps between international institutional design and effect.

The concluding chapter summarizes the findings of the dissertation, considers their implications, and discusses recommendations for future research.

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Chapter 2

Firm-Level Lobbying and the Liberalization of High-Skilled Visa Regulations

2.1 Introduction

The flow of people across borders is the most politically charged and regulated phenomenon in globalization—surpassing cross-border flows of goods or capital (Freeman 2006; Pritchett 2006). Yet, despite such significant barriers to globalization, we still know very little about the formation of immigration policies that regulate flows of people. Existing research in political economy and psychology have focused mainly on understanding the formation of public attitudes towards immigration. The literature then implicitly assumes that attitudes play a key role in shaping immigration policy outcomes.[1] However, a large literature also finds that immigration policies are systematically more open than the public appears to prefer (Messina 1989; Freeman 1995; Joppke 1999; Fetzer 2000; Tichenor 2002; Cornelius 2004; Cornelius and Rosenblum 2005; Citrin and Sides 2008; Facchini and Mayda 2008; Schain 2008; Facchini and Mayda 2009; Freeman and Tendler 2012; Gilens 2012; Hainmueller and Hopkins 2014a).[2] What explains immigration policy outcomes? Furthermore, what explains this gap?

In this chapter, I focus on U.S. high-skilled visa regulations on intra-company transfers by Multinational Corporations (MNCs), and develop a theory of immigration policy formation that distinguishes between immigration laws and the *implementation* of immigration laws.

[1] See Hainmueller and Hopkins (2014a) for a detailed literature review on public attitudes towards immigration.

[2] See Freeman and Tendler (2012) for more details about this puzzle.

Building on median voter and interest group models, I argue that even when the legislature—under the influence of public attitudes—decides on the main parameters of immigration law, firms are able to shape the *implementation* of the law by lobbying bureaucracies and bypassing the legislature. This explains the "open-biasedness" of immigration policy in western democracies found in the literature even when broad public opposition towards immigration is mostly constant across countries and time. Based on the argument, I derive three observable implications related to the effects of firm-lobbying, where and how firms lobby, and whether firms are undermined by collective action problems.

To test the argument, I compile an original data set that combines firm-level data on all approved intra-company transfers to the U.S. by MNCs, firm's financial and lobbying information, and country-specific visa regulations firms face from 2000 to 2013. The data set is, to the best of my knowledge, the first one available in the literature, and reveals insights on firm-level preferences and political actions towards immigration policy. In particular, the data shows new patterns on top firms and industries engaging in intra-company transfers to the US and their lobbying behavior. It also illuminates the institutional venues that are lobbied by firms and the resulting policy outcomes on visa regulations.

Exploiting the granularity of the compiled data, I show three main findings. First, more intensive lobbying by firms sourcing transferees from the same origin-country and targeting the Department of State is associated with more relaxed country-specific L-1 visa regulations. This result holds even when accounting for U.S. bilateral strategic interests and time-invariant characteristics of origin-countries. Given the data limitations on bureaucratic lobbying, this provides, to the author's knowledge, the most fine-grained evidence supportive of firm-lobbying to date. Second, firms strategically allocate their lobbying resources between the legislature and bureaucracies given the visa restrictions they face. While most firms lobby both the Congress and the State Department, firms facing more relaxed visa restrictions are more likely to only lobby the Congress to influence the main parameters of immigration laws. Third, collective action problems undermine firms' lobbying when many firms source transferees from the same country. This offers an explanation for why visa regulations remain restricted for certain origin-countries.

This study makes a number of contributions to the literature on immigration policy formation and international political economy in general. First, the study challenges the common focus on individual and public attitudes in the immigration literature. It joins emerging research that emphasizes the importance of *firms* and their preferences in immigration policy formation.[3] Second, given how much migrant characteristics matter in domestic politics, fine-grained measures play an even more crucial role in the study of migration than studies

[3]See for example, Peters (2014).

on other types of globalization. For example, certain products or foreign direct investments may raise nationalistic sentiments depending on their origins. Yet, the characteristics of goods and capital in general do not provoke opposition as much as migrant characteristics. Most extant immigration policy data sets, however, are monadic (focusing on either the receiving country or the sending country), crude in their classification of migrants, and focus only on immigration laws set in the legislature. This study offers a *dyadic* data set on visa regulations, implemented by bureaucracies, for high-skilled temporary intra-company transferees. Such data facilitates more careful theorizing and empirical tests, and the data-collection approach is easily generalizable to migrants of all visa categories. Third, this study joins a large literature that examines the effectiveness and mechanisms of domestic lobbying on trade policies (Gawande and Bandyopadhyay 2000; Ludema, Mayda, and Mishra 2010; Bombardini and Trebbi 2012; Kim 2013) and financial regulations (Gehlbach 2006; Richter, Samphantharak, and Timmons 2009; Mian, Sufi, and Trebbi 2010; Igan, Mishra, and Tressel 2011; Yu and Yu 2012; Blau, Brough, and Thomas 2013; Hill, Kelly, Lockhart, and Ness 2013). The study's focus on firms and bureaucratic lobbying further distinguishes itself from the extant emphasis on legislative lobbying mechanisms. More broadly, the findings suggest that despite the global competition for talent (Docquier and Machado 2015), even high-skilled migrants are not equal in their mobility. MNCs play an important role in shaping receiving country immigration policies, and their workers are first to benefit.

The outline of this chapter is as follows. Section 2.2 briefly reviews the literature on immigration and presents discrepancies between theoretical predictions and empirical patterns. Section 2.3 draws from median voter and interest group models to develop a theory on multinational firms and the liberalization of high-skilled immigration policy. Section 2.4 presents the original data set. In particular, discussions on data sources, merging, subsetting, and descriptive patterns. In Section 2.5, I present empirical evidence related to firm-lobbying effects, choice of lobbying venues, and collective action problems. Section 2.6 concludes the chapter.

2.2 The Puzzle

There are two main potential domestic explanations for immigration policy outcomes: public attitudes and interest groups (Freeman and Tendler 2012:1). The majority of the immigration literature has focused on studying the formation of public attitudes. This literature builds on rich political economy and psychology survey research to explain individual attitudes toward immigration (see, for example, Scheve and Slaughter 2001; Mayda 2006; Hainmueller and Hiscox 2007; Brader, Valentino, and Suhay 2008; Hainmueller and Hiscox

2010; Dancygier and Donnelly 2013; Freeman, Hansen, and Leal 2013; Malhotra, Margalit, and Mo 2013; Hainmueller and Hopkins 2014b; Hopkins 2014). At its core, the approach derives individual preferences based on natives' perception about the consequences of migrant inflows.[4] It finds consistently that natives support high-skilled immigration regardless of their own skill level, and only low-skilled natives oppose low-skill immigration (Hainmueller and Hiscox 2007; Hainmueller and Hiscox 2010; Hainmueller and Hopkins 2014b). This suggests that sociotropic concerns about the cultural or economic impact of immigrants on the receiving country as a whole shape public attitudes (Hainmueller and Hopkins 2014a). Few studies in this literature, however, have examined empirically the relationship between public attitudes and immigration policy outcomes (Hainmueller and Hopkins 2014a). Instead, the literature implicitly assumes that public attitudes lead to immigration policy outcomes in liberal democracies, presumably through mechanisms advanced by median voter models (Downs 1957). Naturally, the approach emphasizes the importance of voters and the legislature in immigration policy formation.

The main challenge for explanations relying on public attitudes is the frequent discrepancy between theory and empirics: immigration policies are systematically more open than public attitudes appear to prefer. Freeman and Tendler (2012:1) point to a large literature that finds "a frequent disjuncture between hostile publics and more receptive governments." Hainmueller and Hopkins (2014a:244) acknowledge that public attitudes on immigration clarifies this puzzle but can not answer it alone.

Furthermore, immigration policies vary widely even where the literature expects unequivocal public support. In particular, the literature on public attitudes finds natives to support high-skilled immigration regardless of their skill level (Hainmueller and Hiscox 2007; Hainmueller and Hiscox 2010; Hainmueller and Hopkins 2014b). However, we actually observe visa regulations varying widely *among* high-skilled migrants. For example, Figure 2.1 illustrates the variation in United States visa regulations on intra-company transfers (L-1 visas) by Multinational Corporations (MNCs), the focus of this chapter. It shows that L-1 visa validity lengths range widely from 1 to 60 months depending on the origin of transferees.[5]

This is especially puzzling to the literature for several reasons. First, transferees are usually highly skilled foreign executives and managers (L-1A) or workers with specialized knowledge (L-1B). As a result, these transferees do not directly compete with natives in the labor market. In fact, they are usually tasked by multinationals to transfer proprietary

[4]The literature distinguishes between economic and cultural consequences. It also distinguishes between self-interests and sociotropic concerns.

[5]L-1 visa validity lengths are "sticky" over time compared to its cross-sectional variation. Most countries do not experience changes in visa validity lengths during the time frame of the study. Figure 2.A.1 in Appendix 2.A shows the few countries that experienced changes in validity lengths.

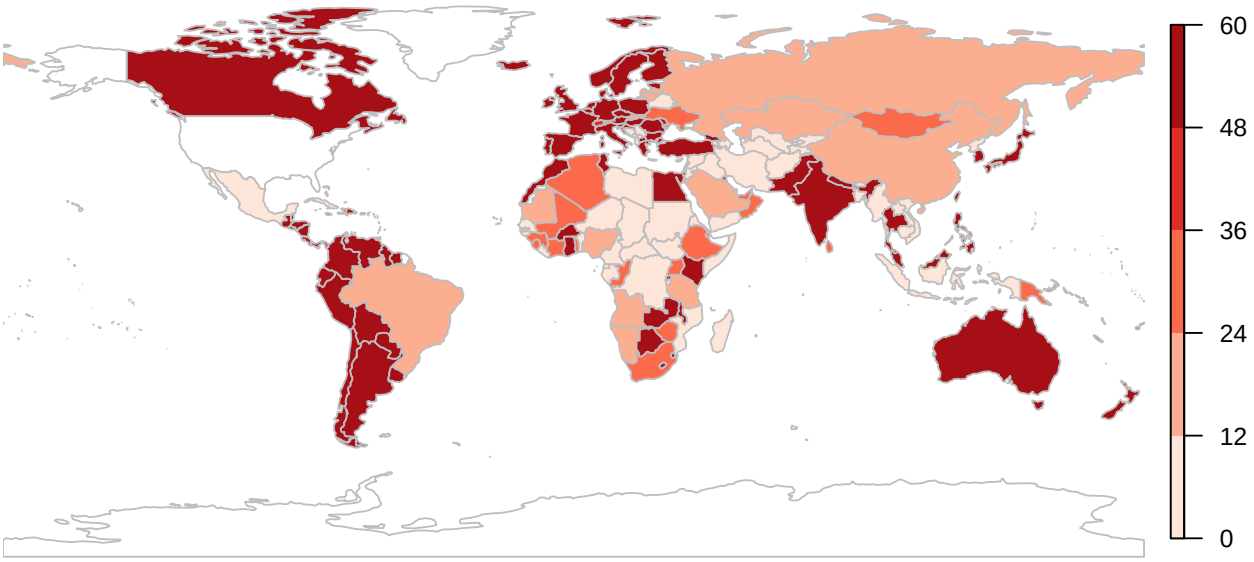

FIG 2.1. L-1 Visa Validity Lengths (months) in 2013.

knowledge to their office in the U.S. Such knowledge transfers are well known to promote the productivity of individuals, firms, and industries, and the economic growth of countries (Romer 1993; Grossman and Helpman 1990; Grossman and Helpman 1993; Peri 2012; Hausmann 2013). Second, these transferees are legal and *temporary* migrants who seldom convert to permanent residence status. This suggests that most transferees return to their home office when their firm-assignment expires. The return of transferees should thus mitigate any natives' concerns about migrants overstaying or fiscal burdens (Hanson, Scheve, and Slaughter 2007).[6] In short, public attitudes toward these high-skilled migrants, regardless due to labor market concerns or sociotropic perceptions of cultural or economic impact, should be consistently positive. Given such discrepancies, what explains variation in the visa regulations?

A growing literature examines the influence of interest groups in immigration policy formation (Freeman 1995; Amegashie 2004; Facchini and Mayda 2009; Facchini, Mayda, and Mishra 2011; Freeman and Tendler 2012; Peters 2014). Similar to the literature on attitudes, this approach relies on the consequences of migrant inflows to derive domestic actors' preferences. However, it expands the focus of domestic actors from individuals to firms and other organized interest groups. Instead of shaping immigration policy through voting, interest groups shape immigration policy by lobbying legislators and other govern-

[6]Hira (2010:6) shows how L-1 visa immigration yields, the ratio of permanent immigration applications filed to L-1 petitions by a specific employer, is very low.

ment officials once they overcome collective action problems (Olson 1965).[7] This approach follows a long tradition in the political economy of trade literature (Grossman and Helpman 1994) on how domestic lobbying influence economic policy outcomes. For example, using a U.S. industry-level dataset, Facchini, Mayda, and Mishra (2011) find that industries lobbying more intensively on immigration are issued more temporary work visas. Focusing on low-skilled immigration policy formation, Peters (2014) shows that firms with less trade protection and more mobile are less likely to lobby on immigration. The lack of support for open immigration, in turn, explains when and why low-skilled immigration policy is more restricted in the US. Compared to the literature on public attitudes, this approach gives primacy to firms, organized interest groups, and their lobbying when explaining immigration policy outcomes.

In the following, I build on insights from both literature and develop a theory of firms and the liberalization of immigration policies.

2.3 Firms and the Liberalization of Visa Regulations

The concept of the "immigration policy" is oftentimes poorly defined and used based on loose common understanding. Yet, a clear and explicit definition is an important first step towards developing a theory about immigration policy formation. Bjerre, Helbling, Römer, and Zobel (2015), building on various definitions in the migration literature, define immigration policy as "government's statements of what it intends to do or not do (including laws, regulations, decisions or orders) in regards to the selection, admission, settlement and deportation of foreign citizens residing in the country."

This definition is useful for two main reasons. First, it distinguishes between different groups targeted by immigration policy. For example, common typologies include labor migrants, migrants for family reunification purposes, and asylum seekers/refugees. Further distinctions include high/low-skilled migrants or temporary/permanent migrants. Naturally, the inflow of these different migrants affect different domestic actors differently. Clarifying the target group of immigration policies helps identify specific domestic winners and losers and their policy preferences toward immigration.[8]

Second, it distinguishes between different policy outputs (laws, regulations, decisions, and orders) regarding different policy objectives (admission, settlement, and deportation). This opens up discussions on how different government actors decide on and implement different

[7] See De Figueiredo and Richter (2014) for a detailed review of recent advances in the empirical research of lobbying.

[8] Essentially, Hainmueller and Hopkins (2014b)'s conjoint analysis advances the literature by leveraging the heterogeneity within migrants to evaluate different theories on the formation of public attitudes.

aspects of immigration policy. It also implies that domestic actors who seek to shape immigration policy may have different advantages over influencing different institutional venues. For example, public attitudes may be more influential in the legislature on immigration laws as the median voter model predicts (Downs 1957). In contrast, firms or interest groups may be more powerful at influencing bureaucracies and shaping the implementation of immigration laws (Yackee and Yackee 2006; Yackee 2006; Binderkrantz, Christiansen, and Pedersen 2014). Such advantages may originate either from smaller collective action problems (smaller interest group sizes) (Olson 1965) or fewer veto players involved in bureaucracies compared to the legislature (Tsebelis 1995). In other words, firms can shape immigration policy via bypassing the legislature. I argue that this framework incorporates main actors (voters and firms) important to the literature, but also explains the conditions under which certain actors become more influential.

In the context of this study, high-skilled intra-company transfers not only affect natives in ways discussed in the previous section, but are also crucial to the operation of MNCs. MNCs choose to internalize production processes through Foreign Direct Investment (FDI) because they want to prevent knowledge leakages and protect ownership advantages of its products (Dunning 1981; Markusen 1995; Helpman 2006). As a result, MNCs have the same incentives to move their *own* experts in order to transfer (extract) technical, managerial, production related knowledge to (from) foreign subsidiaries instead of hiring locally. It is also the case that high-skilled workers hold knowledge capital that is difficult to transfer and best learned through face-to-face demonstration and training (Markusen and Trofimenko 2009; Hausmann 2013). Altogether, the ability to conduct intra-company transfers is significantly important to MNCs.

Stricter visa regulations on intra-company transfers, especially shorter visa validity lengths, limit the effectiveness of MNC's knowledge transfers. In particular, it restricts the duration transferees are allowed to stay and transfer MNC proprietary knowledge (e.g., training local employees). Furthermore, it creates additional hassles in visa applications and fees that raise costs for both the firm and the transferee. For example, this means more frequent relocating and higher pecuniary and psychic migration costs for the transferee (Sjaastad 1962; Todaro 1969; Massey et al. 1993; Borjas 2001). These migration costs are further exacerbated if the transferee has to relocate with spouse and children. As a result, firms oftentimes need to raise material benefits as incentives to encourage their managers or high-skilled employees to move. This, in turn, further increases a firm's operational costs.

Facing stricter visa regulations in intra-company transfers, firms have two main options. First, firms can lobby the legislature for high-skilled immigration law reforms in order to more easily acquire the high-skilled workers they need. In particular, this includes influenc-

ing the main parameters of immigration laws such as the distribution of annual visa quotas.[9] Second, firms can directly lobby the bureaucracy that implements visa regulations within the parameters of immigration law set by the Congress. For example, the U.S. State Department has discretion to make decisions on visa validity lengths, issuance fees, or number of entries allowed per visa. The baseline L-1 visa regulations for newly independent countries are three months, no fees, and one entry, respectively (U.S. Department of State 2015). This temporary reciprocity schedule is used until a formal reciprocity schedule is developed. Alternatively, firms can target powerful legislators who are committee chairs in the legislature and lobby them to influence the way bureaucracies implements visa regulations.[10]

The two options present a trade-off to firms. While broad immigration reform in the legislature is oftentimes difficult to achieve, returns are high for MNCs. On the other hand, while returns due to changes in bureaucracies' visa regulations such as validity lengths are smaller, such changes are not only feasible but may be easier to achieve. For example, Ellermann (2005) shows evidence that the degree of political insulation of bureaucratic agencies explains the gap between immigration laws on deportation and implementation. Yackee and Yackee (2006) find that business interests enjoy disproportionate influence over U.S. bureaucratic policy-making. Therefore, I first hypothesize that more intensive lobbying by firms sourcing intra-company transferees from the same country and targeting the State Department, the more likely they succeed in relaxing visa regulations for the given country. Summarized as follows:

Hypothesis 1: *All else equal, more intensive lobbying by firms sourcing intra-company transferees from the same country and targeting bureaucracies in charge of implementing visa regulations, leads to more relaxed visa regulations for the specific country.*

Given limited lobbying resources and the trade off, I further expect firms to strategically allocate their lobbying resources between the legislature and bureaucracies to maximize their returns. In particular, I expect firms to lobby the State Department on the implementation of visa regulations when broad immigration reform is difficult. When visa regulations are relaxed, firms turn to focus on lobbying the Congress to change the more difficult broader parameters of immigration policy controlled by the Congress. Given how high-skilled immigration is oftentimes bundled with more contentious issues of illegal or low-skilled immigration, which leads to deadlocks in immigration reform, this would explain variation in visa

[9]For example, there are currently no annual caps on the L-1 visa in the US. This contrasts the H-1B visa, which is currently capped annually at 65,000 according to Title 2 Section 214 of the Immigration and Nationality Act.

[10]See De Figueiredo and Richter (2014:167) for more details on target selection in the lobby literature.

regulations absence of changes in public attitudes.[11] Thus, the following hypothesis:

Hypothesis 2: *All else equal, firms sourcing transferees from more relaxed visa regulated countries are less likely to lobby bureaucracies and more likely to lobby the legislature.*

Finally, collective action problems commonly undermine group lobbying effectiveness. Although firms and interests groups may have an advantage when lobbying bureaucracies as discussed previously, I expect collective action problems to still undermine the lobbying effort of firms in cases where many firms source transferees from the same country. In this scenario, firms have incentives to conserve resources and free ride on other firm's lobby efforts. Thus, the following hypothesis:

Hypothesis 3: *All else equal, firms face collective action problems and are less likely to lobby when more firms source transferees from the same country*

The above argument assumes a top-down relationship between the legislature and bureaucracies as advanced by principle-agent models (McCubbins, Noll, and Weingast 1987). In other words, the State Department neutrally implements immigration policies dictated by the Congress. Visa regulations, in turn, reflect baseline public attitudes toward intra-company transferees from different countries, and the lobbying efforts of firms. Yet, it is plausible that international-level strategic interests influence bureaucracies, especially ones that handle foreign affairs. Although decisions on visa regulations are in general made on reciprocity, according to the author's personal correspondence with the US State Department:

> "The (State) Department, in consultation with the Department of Homeland Security makes determinations to increase visa validity. With increases, the Department considers whether a foreign government has agreed to offer similar visa validities for equivalent categories. In addition, the Department considers whether increasing visa validity is consistent with the *overall strategic goals of the bilateral relationship* [emphasis added]."

This suggests that the variation in L-1 visa regulations may also reflect bilateral economic and security interests. As a result, I control for US economic dependence on a partner country, the regime type of the partner, and security concerns toward the partner in the empirical analysis.

[11] Long-run solutions include setting up new subsidiaries in countries given more relaxed visa restrictions, or ultimately exiting the host country in search of other countries more open to intra-company transfers. Given the high costs of the long run options, I argue that firms choose lobbying—at least in the short-run and for the time-frame of this study.

2.4 A New Data Set on High-Skilled Visa Regulations and Firm-Level Lobbying

A contribution of this chapter is to compile an original data set that combines *firm*-level data on all approved intra-company transfer to the U.S. by MNCs, firms' financial and lobbying information, and *country-specific* visa regulations firms face from 2000 to 2013. This data set is, to the best of my knowledge, the first one available in the literature. Given the size and complexity of the data set, I briefly describe in this section main data sources and data merging processes before moving to the empirical analyses.

2.4.1 Firm-Level Data

Approved L-1 Petitions

I obtained United States Citizenship and Immigration Services' (USCIS) data on all public and private firms approved of L-1 petitions from 2000 to 2013 through a Freedom of Information Act (FOIA) request. The data includes the name of the petitioning firm, the country of birth for the transferee, and the total number of approved L-1 petitions for the same firm, year, and country of birth. Overall, it covers at least 82456 unique firms, sourcing intra-company transferees from 184 countries or entities, resulting in a total of 255543 firm-year-country observations.

As is well known, firm names are extremely messy. Yet, firm names are also the key to linking together all the data. I employ the "batch search" function in Orbis to match firm names with unique identifiers in Bureau van Dijk's Orbis database. Focusing only on firms in the USCIS data that produced "best" matches ("A" matches) in Orbis, I merge firm-level petitions with the following firm-level financial and lobbying data.

Financial Data

From the best-matched list of firms in the USCIS data, I select those that were publicly listed in stock exchanges worldwide. I then extract their financial data provided by Bureau van Dijk's Osiris Database. This results in a total of 41930 firm-year observations, from 2000 - 2013.[12]

[12]There is a trade-off between using Osiris and Orbis, both offered by Bureau van Dijk. On one hand, Osiris only provides data on public firms whereas Orbis has information on both public and private firm. On the other hand, Osiris provides long panel data for each firm, many going back to years before the beginning of my empirical analysis. In contrast, Orbis only provides access to data on firms within the last 10 years (2005-2014). Furthermore, data is usually very sparse for small private firms. Given this trade-off, and to

Lobbying Data

For firm-level lobbying, I rely on data compiled by the Center of Responsive Politics (CRP) and obtained from the Senate Office of Public Records (SOPR). The data is based on reports filed under the Lobbying Disclosure Act (LDA). I subset the data to only reports filed under "immigration" from 2000 to 2013. I further subset the data and only include lobbying reports filed by "Orbis-best-matched" public firms in the USCIS data. This results in a total of 106139 client-year-report-agency observations.

2.4.2 Country-Specific Visa Regulations Data

I scrape and parse current and archived U.S. State Department websites on visa reciprocity with automated tools for visa regulations data. These websites detail the issuance fees, maximum period of visa validity, and number of entries allowed for different types of temporary visitors and nationalities. In particular, I focus on the L-1 visa regulations that govern MNCs' intra-company transfers of their foreign executives and managers (L-1A) or workers with specialized knowledge (L-1B) to their US office. This results in data for intra-company transfer visa regulations for 215 partner countries or entities from 2000 - 2013. I then merge country-specific visa regulations with firm-level data based on the country of birth of the transferee.[13]

2.4.3 Final Sample of Data

Overall, the final sample is an unbalanced data set covering 2995 unique publicly listed firms, from 2000 - 2013, sourcing transferees from 152 countries, with a total of 51059 observations. Figure 2.2 illustrates main descriptive patterns within the data. The left column shows top publicly listed firms, industries, and countries of birth for approved L-1 petitions. The right column shows top publicly listed firms approved of L-1 petitions that lobby on immigration, and their target institutional venues.[14]

set a clearly defined population of interest, I focus on public firms in this chapter. Future extensions will incorporate data for private firms from Orbis.

[13] I exclude all observations where the country of birth is unknown or missing.

[14] In addition, Appendix 2.A shows the countries that have experienced L-1 visa validity length changes, top firms based on raw data of all public and private firms, top industries that lobby on immigration, and how the data sample compares to all available data sources on L-1 visas.

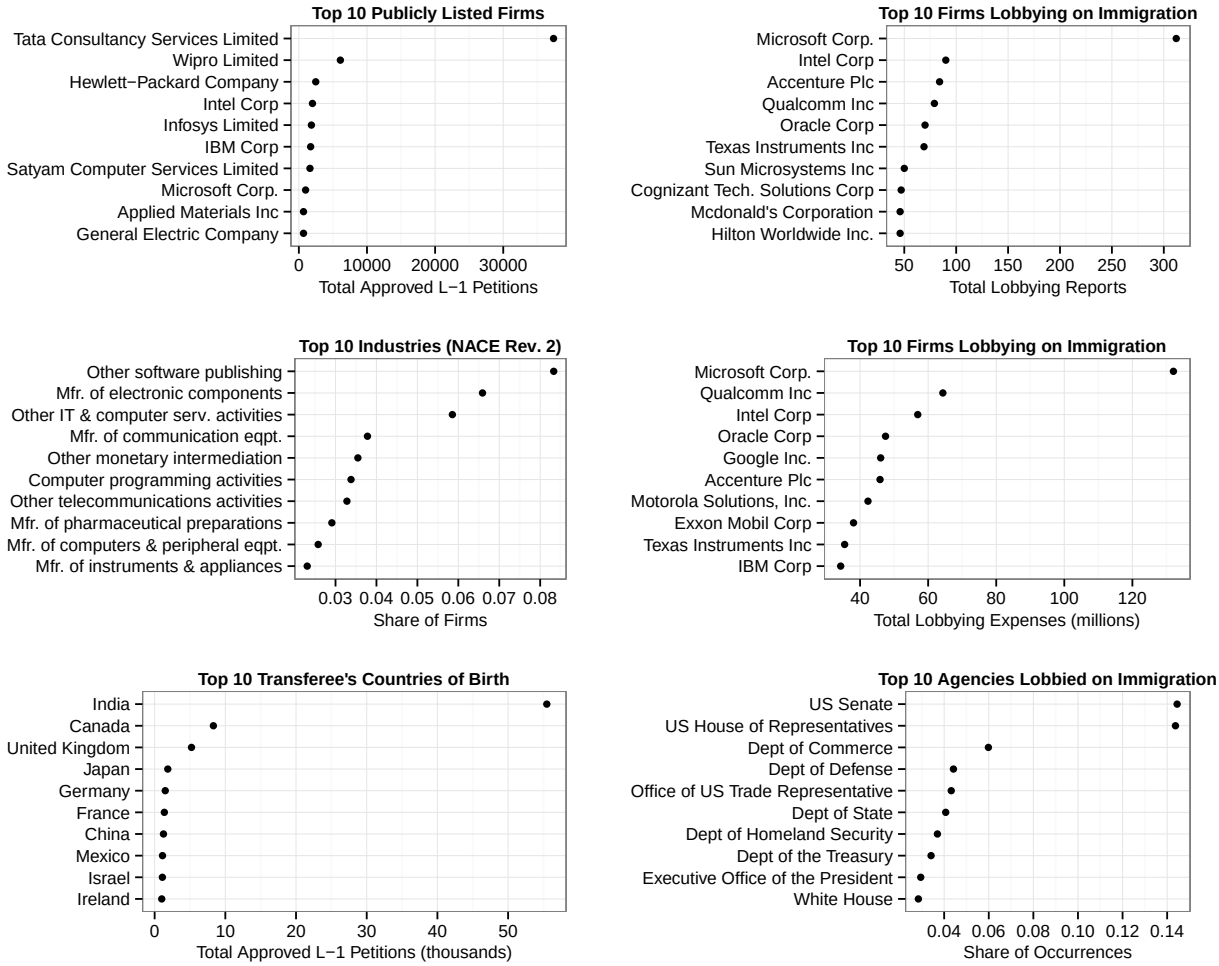

FIG 2.2. Descriptive Patterns for Final Sample of Data, 2000 - 2013. *Note*: The left column shows top publicly listed firms, industries, and countries of birth for approved L-1 petitions. The right column shows top publicly listed firms that lobby on immigration, and their target institutional venues.

2.5 Empirical Analyses

2.5.1 Firm-Lobbying and L-1 Visa Regulations

In this section, I provide empirical evidence supporting the claim that more intensive lobbying by firms is associated with more relaxed country-specific high-skilled visa regulations.

Operationalization

`L-1 Visa Regulation` is the outcome of interest in this analysis. It is operationalized as the natural logarithm of L-1 visa validity lengths (months) previously illustrated in Figure 2.1. The lobbying intensity of firms on country-specific L-1 visa regulations is the key predictor.

However, measuring country-specific lobbying intensities of firms is challenging for several reasons. First, it is obviously difficult to acquire data or any confirmation from the State Department on firm's lobbying behavior. Second, although SOPR's lobbying data shows the general issue of every lobbying report filed (e.g. immigration), it does not systematically document more specific issues (e.g. H-1B & L-1 visa programs).

To overcome these challenges, I combine information on firms' demand for L-1 visa and their lobbying behavior to construct two country-year measures of lobbying intensity. The proxies are constructed in the following steps. First, I subset the compiled data set and only include observations for publicly listed firms with approved L-1 visas and previously lobbied the State Department on immigration. Next, I group firms by the country they source transferees, and aggregate the total yearly lobbying reports filed, or total yearly lobbying expenses spent, by firms of the same group. These measure of reports or expenses capture the yearly lobbying intensity from firms sourcing transferees from the same country. Finally, I calculate the `cumulative total of lobbying reports` and the `cumulative total lobbying expenses` for each country since 2000 up to the given year. Given the "sluggishness" of visa regulations, the cumulative measures capture the total lobbying efforts firms sourcing from the same country have spent. Overall, although this approach greatly reduces my sample size to 543 observations, it allows me to construct measures of country-specific lobbying intensity by firms shown to have both the motive (these firms were approved of L-1 petitions) and actions (these firms lobbied the State Department on Immigration) to influence L-1 visa regulations. Figure 2.B.1 in the Appendix illustrates the variation in yearly cumulative total of lobbying reports across different transferee origin-countries.

Models

With (log) L-1 visa validity lengths as my outcome of interest and (log) cumulative total lobbying reports (expenses) as my main predictor, I fit a set of Ordinary Least Squares (OLS) models. The models begin with a simple bivariate linear regression, to fuller linear models that include either country or year fixed effects, and finally to linear models with both controls and fixed effects. Country fixed-effects account for any time-invariant factors that explain baseline differences in L-1 visa validity lengths across countries. For example, even though transferees are all highly skilled, natives may have sociotropic concerns about transferees from certain countries of origin—perceiving these transferees as threats to national identity or economy—according to the literature on public attitudes. In particular, Hainmueller and Hopkins (2014b) find that U.S. survey respondents are more likely to oppose migrants from China, Iraq, Sudan, and Somalia compared to Indian migrants. Such public attitudes may, in turn, influence State Department decisions on visa validity lengths

and bias my estimates.[15] Year fixed-effects account for any country-invariant global shocks or trends that lead to longer (shorter) L-1 visa validity lengths.

I also include a set of country and year-varying covariates for US economic dependence (`US trade dependence`), partner country `regime type`, and security concerns (partner country `cumulative total terrorist attacks`) that may confound the relationship between firms' lobbying intensity and country-specific L-1 visa validity lengths. Finally, given the relatively small sample size, I also fit a linear mixed effects model that includes both varying intercepts for countries and years, varying slopes for lobbying intensity (by both country and year), and the same control covariates. The full model specification is expressed formally below:

$$\log(\textsc{VisaReg})_{it} = \beta_1 \log(\textsc{LobbyIntensity})_{it} + \boldsymbol{\beta_2 Z_{it}} + \delta_i + \lambda_t + \epsilon_{it} \tag{2.1}$$

where i and t index countries and years, respectively. $\boldsymbol{Z_{it}}$ is a vector of control covariates discussed above. δ_i and λ_t indicate country and year fixed-effects (or varying intercepts in the mixed effects model), respectively. For details about variables and descriptive statistics, see Appendix 2.B.

Findings

Figure 2.3 shows estimated coefficients for cumulative total lobbying reports under different model specifications.[16] In particular, linear models with country fixed-effects (or varying intercept in the mixed effects model) have smaller estimated coefficient than models with year fixed-effects. This fits the broader pattern that most variation in L-1 visa validities is cross-sectional instead of temporal. As a result, a temporal increase in lobbying intensity within a given country is statistically significant but yields smaller estimates.

Substantively speaking, I find that doubling total cumulative lobbying reports targeting the Department of State, by publicly listed firms sourcing transferees from the same country, is associated with, on average, 2% to 7% longer L-1 visa validity lengths for that given country.[17] This translates to an additional 2 to 6 months of total visa validity length for high-skilled executives and workers for a typical firm in a given year—suggesting a sizable

[15] There is some support for this claim. India's L-1 visa validity was extended from 12 to 60 months in 2006. Meanwhile, China, Iraq, and Sudan L-1 visa validities are 24, 3, 12, 3 months respectively.

[16] Table 2.C.1 in the appendix shows further details.

[17] Since both the main predictor and the outcome of interest are logged, one can interpret predictive effect sizes in terms of elasticity. For example, doubling total cumulative lobbying reports (i.e., a 100% increase) combined with a conservative estimated coefficient of 0.1 yields $e^{0.1 \times log(2)}$, which equals 1.07, or 6.8% longer visa validities.

increase in time for firms to train locals and transfer proprietary knowledge.[18]

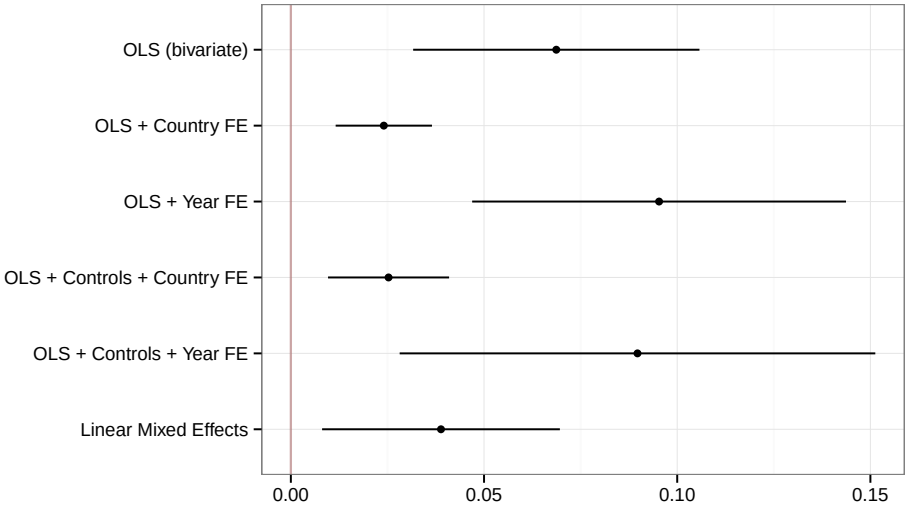

FIG 2.3. Estimated Coefficients for Cumulative Lobbying Reports (Log) Under Different Model Specifications. *Note*: Doubling total cumulative lobbying reports targeting the Department of State, by publicly listed firms approved of L-1 visas and sourcing transferees from the same country, is associated with, on average, 2% to 7% longer L-1 visa validity lengths for the given country.

Figure 2.4 shows simulated results based on quasi-Bayesian methods after fitting the most conservative country fixed-effects model. Again, it shows that predicted L-1 visa validity lengths increase as cumulated lobbying reports on immigration for a country increase. In particular, the main changes are within one standard deviations of the mean.

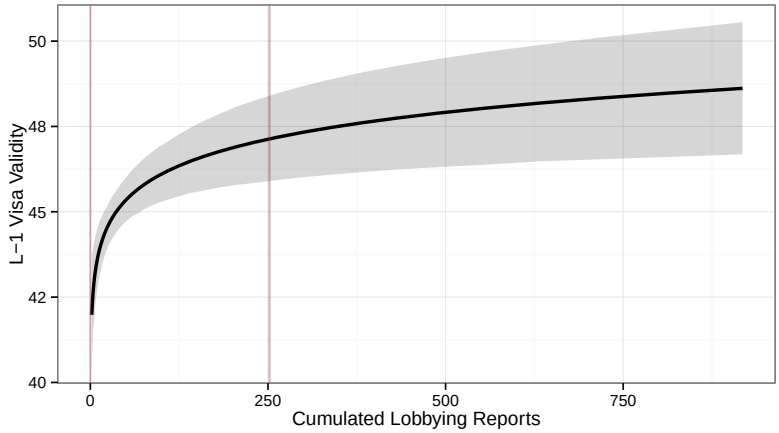

FIG 2.4. Predicted Effects of Cumulated Lobbying Reports. *Note*: Red lines indicate one standard deviation above and under the mean.

[18] In particular, for a typical firm in the dataset that faces 53 month average L-1 validity length restrictions, and are approved 2 transferees per year.

Figure 2.C.1 in the appendix shows the heterogeneity of the effects of lobby intensity by country based on results from the mixed effects model. For most countries, the estimated varying slopes (random effects) are not significantly different from the average positive estimate shown in Figure 2.3. However, lobby intensity shows even larger and positive predictive effects in a few countries such as India, Vietnam, and Sri Lanka. For example, doubling the lobbying intensity for these countries is associated with 41%, 43%, and 26% longer L-1 visa validities, respectively. This is despite shorter baseline predictions about validity lengths for the countries.[19] In short, findings for the mixed-effects model suggest that firm lobbying contributed to the L-1 visa validity extensions in these three particular countries.

Robustness Checks

The findings are robust to several robustness checks. First, the substantive findings are consistent when using instead the natural logarithm of cumulative lobbying expenses. See Table 2.C.2 in Appendix 2.C for details. However, this measure should be treated with caution given the way firms report lobbying expenses. For each report, total lobbying expenses sums the expenses firms spend lobbying on a specific issue across different institutional venues. While the measure is precise when firms only lobby the State Department on immigration, it can be problematic when firms lobby many other venues including the Senate, the House, and Homeland Security. The latter scenario introduces a substantial amount of noise since one cannot tease out the proportion of expenses firms spend on lobbying the State Department. Despite the measurement problem with lobbying expenses, results are consistent with findings using lobbying reports.

Second, results are also consistent when treating L-1 visa validities (months) as count data. The discrete distribution of L-1 visa validities on its original scale, shown in Figure 2.B.2 in the appendix, raises concerns about violations of i.i.d (Independent and Identically Distributed) or homoscedastic error terms under linear regressions. Such violations can lead to problematic standard errors and levels of uncertainty for estimates of predictors. As a result, I fit two alternative sets of count models: Poisson and quasi-Poisson. Both models include country fixed-effects. The latter model further accounts for problems of overdispersion that usually lead to overconfident estimates. Substantive results, shown in the first two columns of Table 2.C.3, are consistent with the main findings.

Third, given the break in distributions shown in Figure 2.B.2, I collapse L-1 visa validity lengths into a dichotomous variable (60 months as 1 and 0 otherwise). I then fit logit models to estimate the probability changes of long vs. short L-1 visa validity lengths for a given country as firm lobbying intensity changes. In particular, a logit model that includes

[19] See varying intercept estimates.

aforementioned controls, and a conditional logit model with country fixed effects. The latter addresses the well-known incidental parameter problem when including fixed effects in binary response models Lancaster (2000). Substantive results, shown in the last two columns of Table 2.C.3, are also consistent with main findings.

2.5.2 Visa Regulations and Choice of Lobbying Venues

After showing evidence on the impact of firm-lobbying, I turn to examine *how* firms lobby on immigration in this section. In particular, I show evidence that firms strategically allocate their lobbying resources between the legislature and bureaucracies given country-specific visa regulation they face.

Operationalization and Models

Given the focus on firms' choice of lobbying institutional venue, I subset the data to 98 publicly listed firms that lobbied on immigration between 2000 - 2013 and were approved of intra-company transfers. The unit of analysis of this data subset is firm-country-year. The outcome of interest is a trichotomous measure of `Institutional Venue Choice`: lobby only the State Department, lobby only the Congress, or lobby both institutional venues. The key covariate of interest is `L-1 Visa Validity Lengths`, which is operationalized in the same way as in the previous analysis. Additionally, I control for `Firm Size` that may affect both the visa regulations firms receive and where they lobby. I measure firm size using Osiris' data on number of subsidiaries under MNCs. Finally, I fit multinomial logistic regression models given the trichotomous outcome of interest. The model is expressed formally below:

$$\Pr(\textsc{VenueChoice}_{fit} = K) \quad = \quad \text{logit}^{-1}(\beta_0 + \beta_1 \textit{VisaReg}_{fit} + \beta_2 \textit{FirmSize}_{fit}) \quad (2.2)$$

where f, i, and t index countries, firms, and years, respectively. K equals the choice of institutional venue.

Findings

Figure 2.5 shows simulated results based on quasi-Bayesian methods after fitting the multinomial logit model.[20] The findings show that while most firms lobby both the Congress and the State Department, firms facing more relaxed visa regulations are more likely to lobby only the Congress. Additionally, very few firms lobby solely the State Department. Two

[20]Table 2.C.4 in the appendix shows further details.

main implications follow. First, although firms seek broader changes in immigration reform firms, they are also aware of the benefits of bureaucratic lobbying on implementation. This points to a causal mechanism understudied in the current literature on immigration policy formation. Second, firms strategically allocate their lobbying resources between the legislature and bureaucracies given the visa regulations they face to maximize returns. When visa regulations are relaxed, the need and returns of lobbying on implementation diminishes, and firms turn to lobby the legislature for broader immigration reforms.

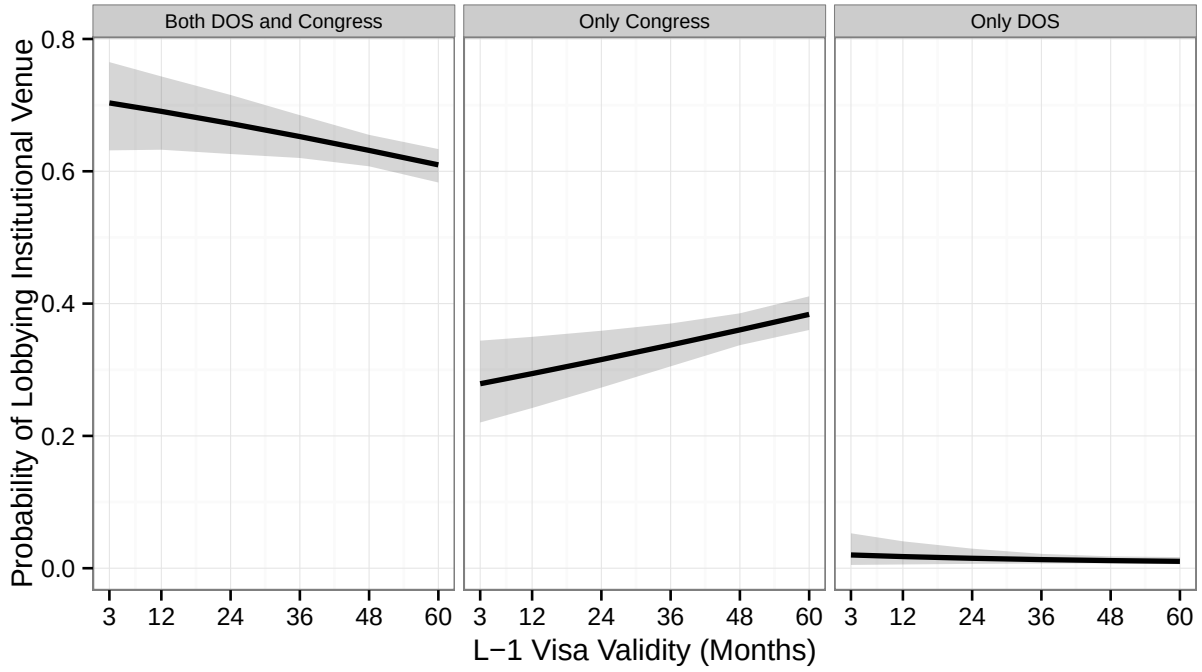

Fig 2.5. L-1 Validity and Predicted Probability of Lobby Institutional Venue.

2.5.3 Collective Action Problem and Firm-Lobbying

The previous sections show empirical evidence on how firms are effective and strategic when influencing immigration policy. In this section, I examine whether collective action problems, commonly discussed in interest group models, undermine firm-lobbying behavior.

Operationalization and Models

I focus again on firm-country-year as the unit of analysis. However, I include in this analysis the full sample of firms approved for intra-company transfers. The outcome of interest is a dichotomous variable `Lobby on Immigration`, which measures whether a firm lobbies

on immigration in a given year when sourcing transferees from a given country. The key covariate of interest is a country-specific measure that captures the `Potential Lobby Group Size`. This is calculated as the total number of firms sourcing transferees from the same country and in the same year. Additionally, I control for `Firm Size` that may influence both the number of firms sourcing from the same country and also whether the firm decides to lobby. For example, it is likely that small firms are only able source transferees from the same set of countries given their resources (increasing the potential lobby group size), but are also restricted in their level of lobbying. Finally, I fit mixed effects logit models with varying intercepts for industry, source country, or year to account for any additional heterogeneity at each level. The model is expressed formally below:

$$\begin{aligned} &\Pr(\textsc{Lobby}_{fit} = 1) = \text{logit}^{-1}(\alpha_s + \delta_i + \lambda_t + \beta_1 \textsc{LobGroupSize}_{it} + \beta_2 \textit{FirmSize}_{fit}) \\ &\alpha_s \overset{i.i.d.}{\sim} \mathcal{N}(\alpha, \sigma_\alpha^2),\ \delta_i \overset{i.i.d.}{\sim} \mathcal{N}(\delta, \sigma_\delta^2),\ \lambda_t \overset{i.i.d.}{\sim} \mathcal{N}(\lambda, \sigma_\lambda^2), \end{aligned} \tag{2.3}$$

where f, i, and t index countries, firms, and years, respectively. α_s, δ_i and λ_t indicate varying intercepts for industry, country, and year, respectively. The varying intercepts are distributed normally.

Findings

Figure 2.6 shows simulated results based on quasi-Bayesian methods after fitting mixed effects logit models.[21] The left panel shows results for a mixed effects model with varying intercepts for both industry and year while controlling for firm size. It suggests that, comparing firms of similar size and in the same industry and year, those sourcing transferees from countries where more firms do are less likely to lobby on immigration. The right panel shows results for a mixed effects model with varying intercepts for both industry and transferee origin-country while controlling for firm size. It suggests that, comparing firms of similar size, in same industry, and sourcing transferees from the same country, as more firms join to source transferees from the same country, firms become less likely to lobby on immigration. Overall, both results indicate that collective action problems undermine firm's decision to lobby on immigration, and may explain why visa regulations for some origin-countries remain relatively restricted.

[21] Table 2.C.5 in the appendix shows details of the fitted models.

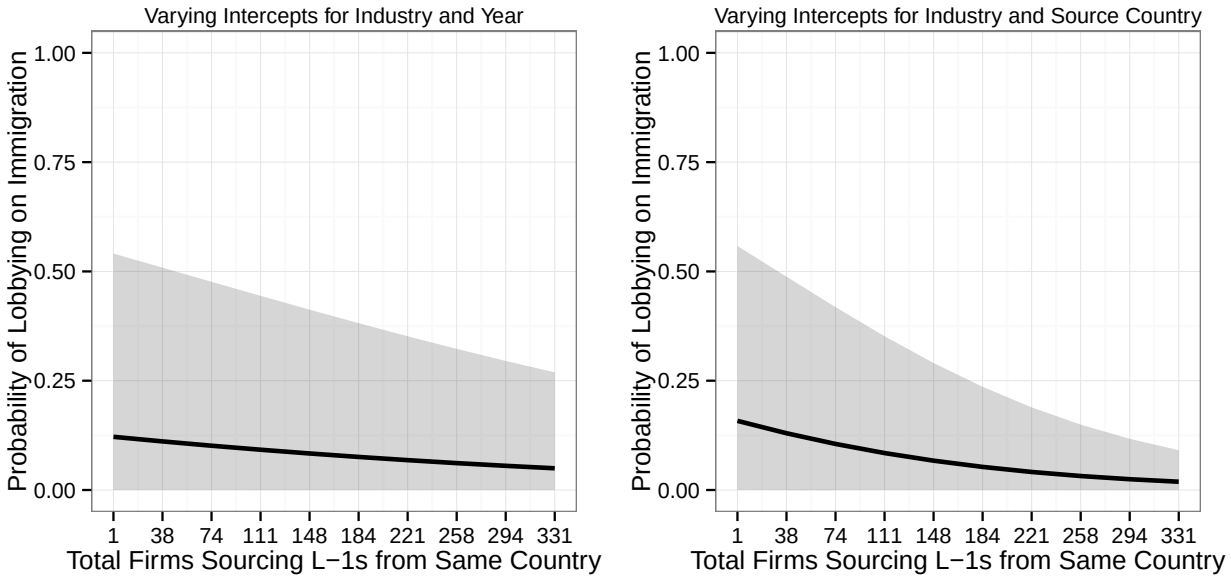

FIG 2.6. Potential Lobby Group Size and Firm's Decision to Lobby on Immigration. *Note*: The left panel shows predicted probabilities of lobbying based on a mixed effects logit model with varying intercepts for industry and year. The right panel shows results for a mixed effect model with varying intercepts for industry and transferee origin-country.

2.6 Concluding Remarks

It is difficult to overstate the importance of understanding the formation of immigration policies that regulate cross-border people flows. While advances have been made in the literature on public attitudes toward immigration, extant literature is still perplexed by empirical patterns that show systematically more receptive government policies than public attitudes.

Building on the extant literature on public attitudes, and a growing literature based on interest group models, I develop a theory of immigration policy liberalization to explain this discrepancy. In particular, focusing on U.S. visa regulations on intra-company transfers by MNCs, I argue that firms shape the *implementation* of visa regulations through bureaucratic lobbying despite public attitudes setting immigration laws in the legislature. The focus on L-1 visa regulations offers a unique opportunity to adjudicate between the influence of firm-lobbying and public attitudes. First, public attitudes have been generally stable and positive towards high-skilled immigration over time in the US. Second, no major immigration reform has passed both chambers of the Congress during the period of focus. Third, unlike the H-1B visa, there are no L-1 visas quotas. Therefore, the influence of the Congress on State Department's implementation of L-1 visa regulations, as suggested by principle-agent models,

should be minimum.

Exploiting firm-level data and dyad-level visa regulations from 2000 to 2013, I find that firms are both successful and strategic when lobbying on visa regulations. However, collective action problems can still undermine firm-lobbying. The findings not only provide empirical support for *whether* multinational firms shape immigration policy formation, but more importantly on *how* firms do so and on *what* aspects of immigration policy.

This study makes a number of contributions to the literature on immigration policy formation and international political economy in general. First, the study challenges the common focus on individual and public attitudes in immigration policy formation, and joins emerging research that emphasize the importance of *firms* and their preferences in immigration policy formation.[22] In particular, the extant literature implicitly relies on public attitudes to explain immigration policy outcomes. A growing literature leverages industry-level preferences to study the influence of interest groups. This study develops a *firm*-level theory of immigration policy formation and shows that MNCs influence policy outcomes based on *where* they source their intra-company transferees. Overall, it contributes to the growing empirical literature on the domestic politics of immigration policy-making (Amegashie 2004; Facchini and Mayda 2009; Facchini, Mayda, and Mishra 2011; Freeman and Tendler 2012; Peters 2014).

Second, there is a growing consensus in the literature for more nuanced explanations of immigration policy outcomes due to the its multidimensionality (DeLaet 2000:114 and Freeman and Tendler 2012:1). However, most extant immigration policy data sets are monadic (focusing on either the receiving country or the sending country), crude in their classification of migrants, and focus only on *de jure* immigration laws set in the legislature.[23] This study offers a new *dyadic* immigration policy data set that focuses on a specific type of high-skilled temporary migrants (MNC intra-company transferees) and visa regulations implemented by bureaucracies.[24] Although the current data set only includes intra-company transferees, the data collection method is easily generalizable to migrants in all visa categories or even other receiving countries.[25]

Third, this study joins a large literature that examines the effectiveness and mecha-

[22]For example, Peters (2014) finds evidence for the influence of firms in *low-skilled* immigration policy formation

[23]See Bjerre, Helbling, Römer, and Zobel (2015) for a review of thirteen immigration policy indices. See also the ongoing projects of the Immigration Policies in Comparison (IMPIC) Index, the International Migration Law and Policy Analysis (IMPALA) database, and Peters (2015) new dataset on low skilled immigration policy since late 18th century.

[24]To the best of my understanding, Neumayer (2006) and Neumayer (2010)'s cross-sectional dataset on visa waivers is the only other existing dyadic migration policy dataset.

[25]Intra-company visas also exist in many other receiving countries such as the United Kingdom, Canada, Japan, and South Korea.

nisms of domestic lobbying on trade policies (Gawande and Bandyopadhyay 2000; Ludema, Mayda, and Mishra 2010; Bombardini and Trebbi 2012; Kim 2013) and financial regulations (Gehlbach 2006; Richter, Samphantharak, and Timmons 2009; Mian, Sufi, and Trebbi 2010; Igan, Mishra, and Tressel 2011; Yu and Yu 2012; Blau, Brough, and Thomas 2013; Hill, Kelly, Lockhart, and Ness 2013). However, the study's focus on firms and bureaucratic lobbying distinguishes itself from and complements the extant emphasis on legislative lobbying mechanisms.

More broadly, the findings suggest that despite the global competition for talent (Docquier and Machado 2015), high-skilled migrants are not equal in their mobility. MNCs play an important role in liberalizing receiving country immigration policies, and their workers are first to benefit from their lobbying. However, receiving countries still have much to gain from high-skilled migrants who are not employed by MNCs but are limited in their mobility.

Finally, the large and granular data compiled for this project enables several extensions of the chapter. First, future research can examine how firms strategically allocate lobbying resources between the legislature and bureaucracies depending on firm-level characteristics. Second, future research can also examine the size of the effects high-skilled visa regulations have on firm-level productivity. This would further uncover firm-level preferences that shape immigration policy formation.

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Appendix

Appendix 2.A Data Appendix: Additional Descriptive Patterns

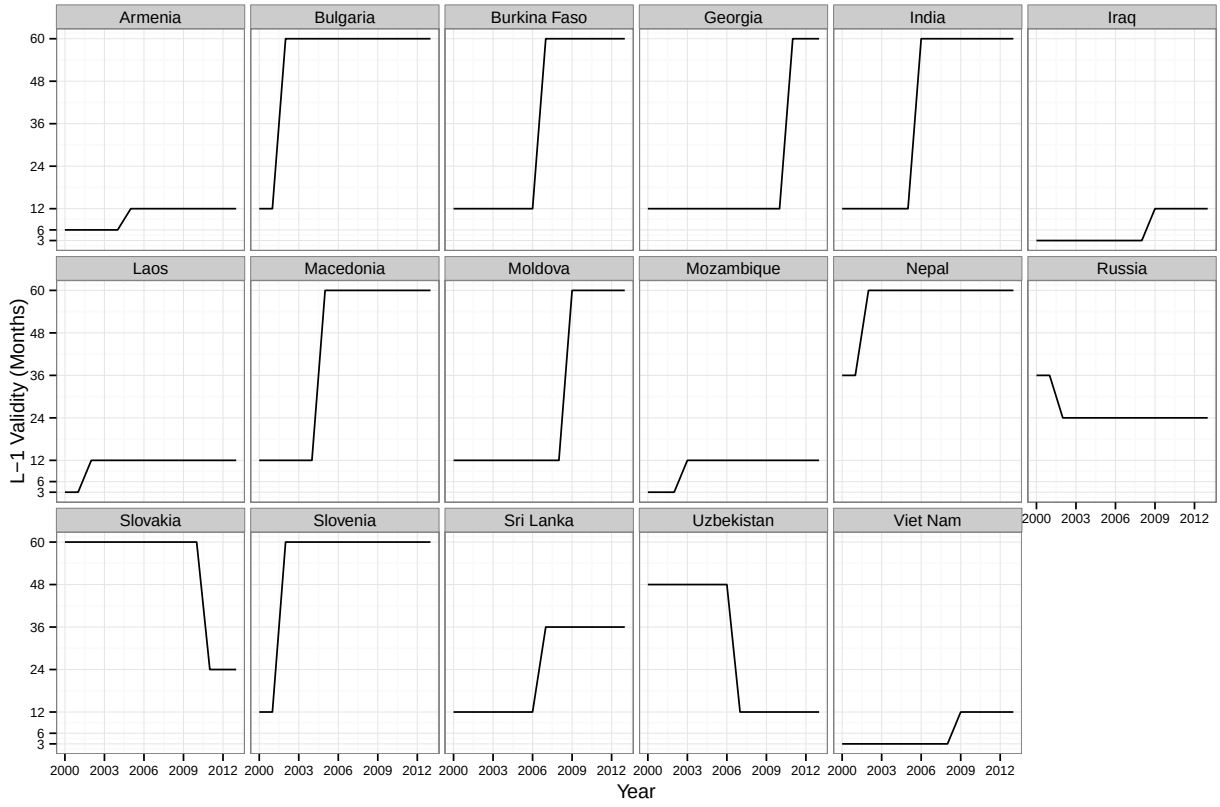

Fig 2.A.1. Countries with L-1 Validity Length Changes, 2000 - 2013. Validity lengths for most countries do not change.

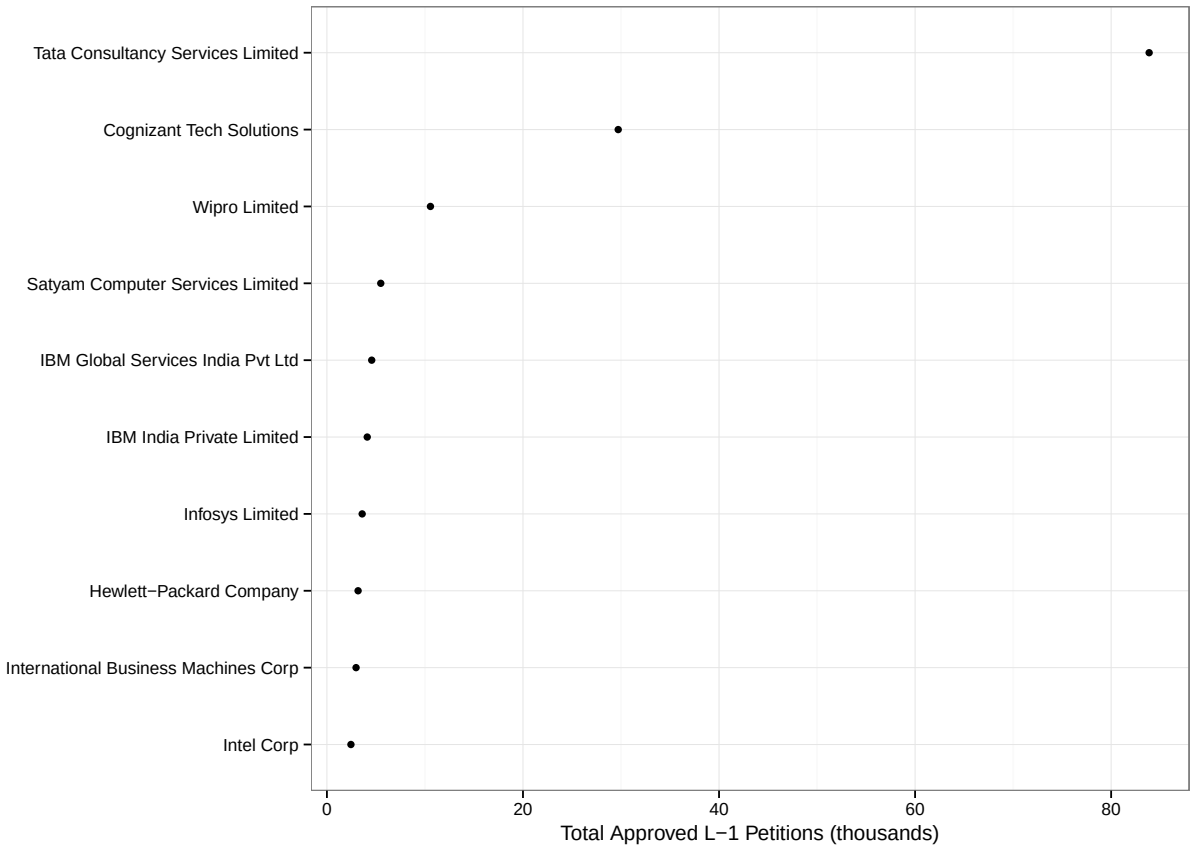

Fig 2.A.2. Top 10 Publicly Listed or Private Firms Approved of L-1 Petitions, 2000 - 2013. Based on raw petitions data, and includes approved petitions with transferee's country of birth missing or unknown.

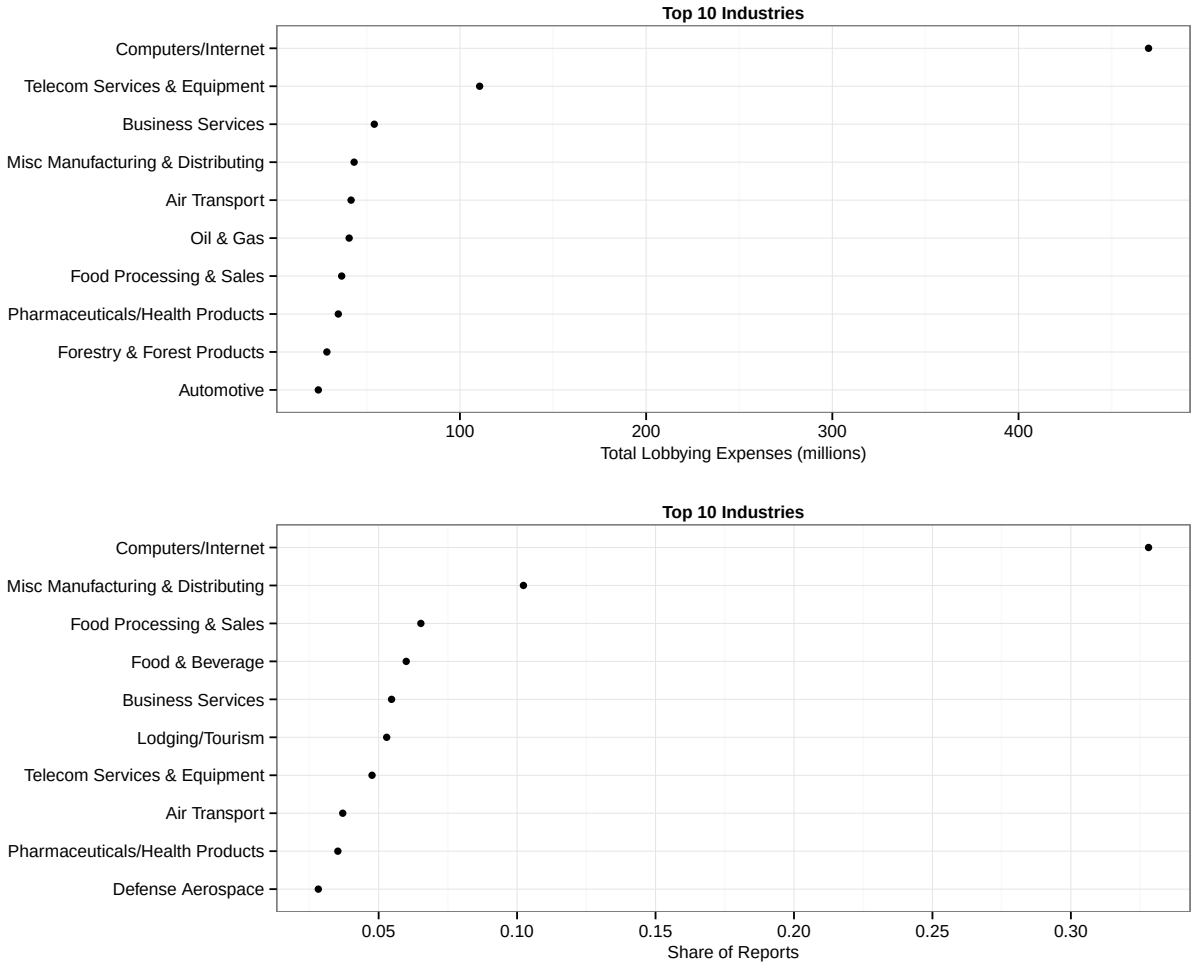

FIG 2.A.3. Top 10 Industries of Firms in Sample that Lobbied on Immigration, 2000-2013.

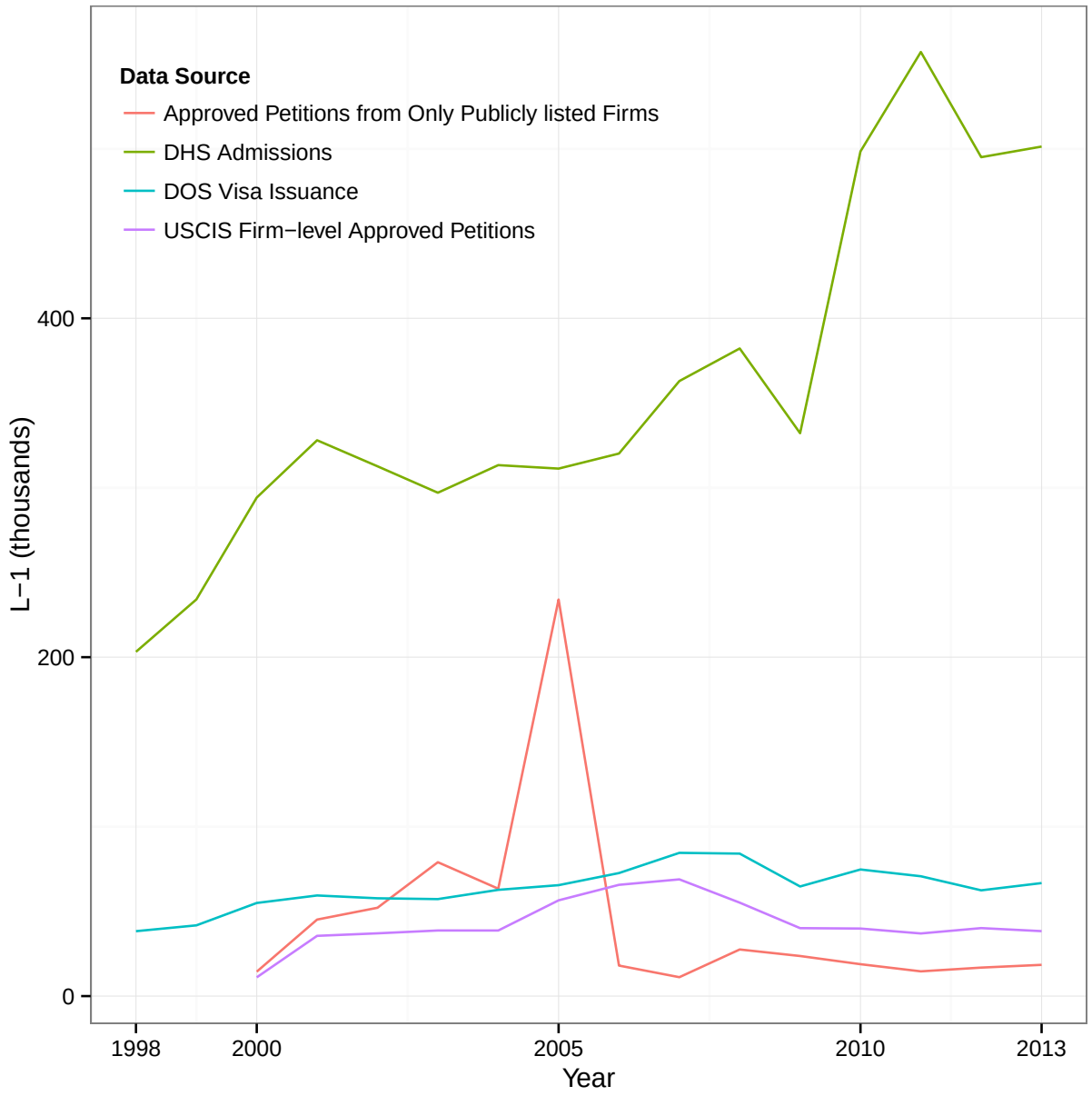

FIG 2.A.4. Comparing Final Sample of Data With All Existing Data on L-1 Visas.

Appendix 2.B Variables and Descriptive Statistics

Variable	*Operationalization*	*Source*
L-1 Visa Validity Length	The maximum length of time for which L-1 visa holders are permitted to travel to a port-of-entry in the US (logged months).	State Department
Cumulative Total Lobbying Reports	The cumulative total of lobbying reports filed by MNCs sourcing transferees in the same country and year.	constructed by author
Cumulative Total Lobbying Expenses	The cumulative total of lobbying expenses spent by MNCs sourcing transferees in the same country and year.	constructed by author
US Trade Dependence	Bilateral trade of goods (exports + imports)/ US Real GDP (log).	UN Comtrade (2013), Feenstra, Inklaar, and Timmer (2013), Taiwan National Statistics (2013)
Regime Type	Polity Score 2.	POLITY IV (Marshall, Jaggers, and Gurr 2012)
Cumulative Terrorist Attacks	Cumulative sum of terrorist attacks in partner country (log).	National Consortium for the Study of Terrorism and Responses to Terrorism (START) (2013)

TABLE 2.B.1. Variables, Operationalization, Sources

Variable	$\bar{x}$	**Min**	**Max**	**n**	**#NA**
L-1 Validity	50.60	3.00	60.00	521	22
US Trade Dependence	0.45	0.00	4.55	450	93
Regime Type	6.94	-10.00	10.00	505	38
Cumulative Terrorist Attacks	2114.64	0.00	258842.00	543	0

TABLE 2.B.2. Descriptive Statistics (untransformed)

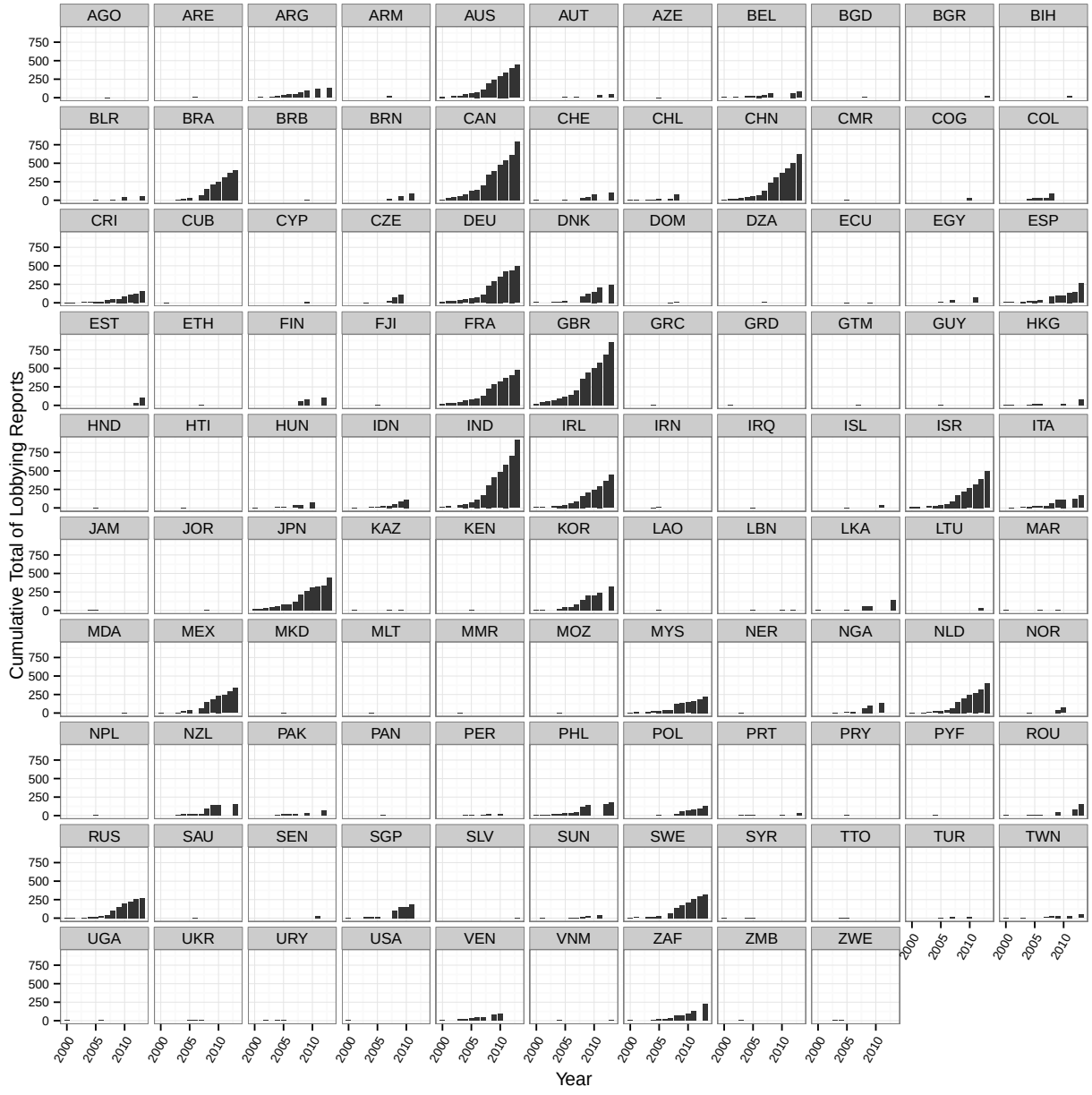

Fig 2.B.1. Cumulative Total of Lobbying Reports by Transferee Origin-Country and Year. India, the United Kingdom, Canada, China, and Israel have the largest total of cumulative lobbying reports. Note that L-1 visa validity lengths for the top country, India, was extended from twelve to sixty months in 2006. This provides preliminary support for the argument in this chapter.

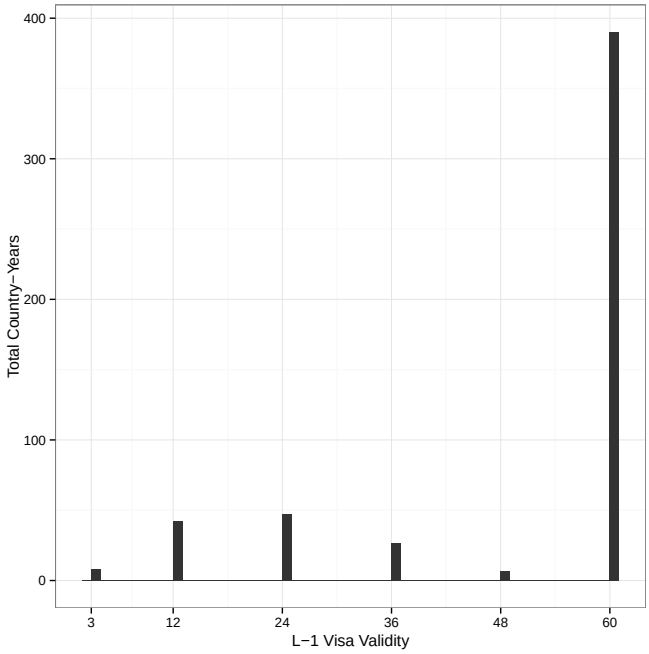

Fig 2.B.2. L-1 Validity by Total Country-Years.

Appendix 2.C Fitted Model Details

	OLS	OLS + FE	OLS + FE	OLS + FE	OLS + FE	LMM
(Intercept)	3.560***	3.152***	3.600***	3.165***	3.342***	3.541***
	(0.083)	(0.158)	(0.112)	(0.158)	(0.106)	(0.100)
Cumulative Lobbying Reports (log)	0.069***	0.024***	0.095***	0.025**	0.090**	0.039*
	(0.019)	(0.006)	(0.025)	(0.008)	(0.031)	(0.016)
US Trade Dependence				−0.006	−0.085*	
				(0.042)	(0.035)	
Regime Type				0.007	0.055***	
				(0.010)	(0.005)	
Cumulative Terrorist Attacks				−0.003	−0.023**	
				(0.004)	(0.009)	
Country FE		✓		✓		
Year FE			✓		✓	
Country & Year Varying Intercept						✓
Num. obs.	521	521	521	433	433	521
R^2	0.031	0.944	0.046	0.948	0.297	
Adj. R^2	0.029	0.930	0.020	0.934	0.272	
AIC						−361.518
BIC						−323.216
Log Likelihood						189.759
Num. groups: iso3c						105
Num. groups: year						14

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\wedge}p < 0.1$

TABLE 2.C.1. Fitted OLS and Linear Mixed Effects Results with Main Predictor: Cumulative Lobbying Reports.

	OLS	OLS + FE	OLS + FE	OLS + FE	OLS + FE	LMM
(Intercept)	3.054***	3.012***	3.066***	3.050***	3.030***	3.039***
	(0.357)	(0.171)	(0.291)	(0.174)	(0.303)	(0.271)
Cumulative Lobbying Expenses (log)	0.044*	0.015**	0.049**	0.013*	0.030	0.037*
	(0.020)	(0.006)	(0.019)	(0.006)	(0.021)	(0.015)
US Trade Dependence				0.021	−0.053	
				(0.041)	(0.033)	
Regime Type				0.007	0.059***	
				(0.010)	(0.005)	
Cumulative Terrorist Attacks				−0.002	−0.018*	
				(0.004)	(0.009)	
Country FE		✓		✓		
Year FE			✓		✓	
Country & Year Varying Intercept						✓
Num. obs.	521	521	521	433	433	521
R^2	0.016	0.943	0.031	0.947	0.287	
Adj. R^2	0.014	0.929	0.005	0.932	0.261	
AIC						−268.396
BIC						−230.094
Log Likelihood						143.198
Num. groups: iso3c						105
Num. groups: year						14

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\wedge}p < 0.1$

TABLE 2.C.2. Fitted OLS and Linear Mixed Effects Results with Main Predictor: Cumulative Lobbying Expenses

	Poisson	Quasi-Poisson	Logit	Conditional Logit
(Intercept)	3.164***	3.164***	−0.496	
	(0.204)	(0.145)	(0.337)	
Cumulative Lobbying Reports (log)	0.013*	0.013**	0.201*	31.767***
	(0.006)	(0.004)	(0.101)	(0.000)
US Trade Dependence			−0.288^	
			(0.160)	
Regime Type			0.207***	
			(0.026)	
Cumulative Terrorist Attacks			−0.088*	
			(0.041)	
Country FE	✓	✓		✓
AIC	3397.567		405.175	2.000
BIC	3848.676		425.529	
Log Likelihood	−1592.783		−197.588	
Deviance	242.276	242.276	395.175	
Num. obs.	521	521	433	521

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\wedge}p < 0.1$

TABLE 2.C.3. Fitted Count and Logit Model Results with Main Predictor: Cumulative Lobbying Reports.

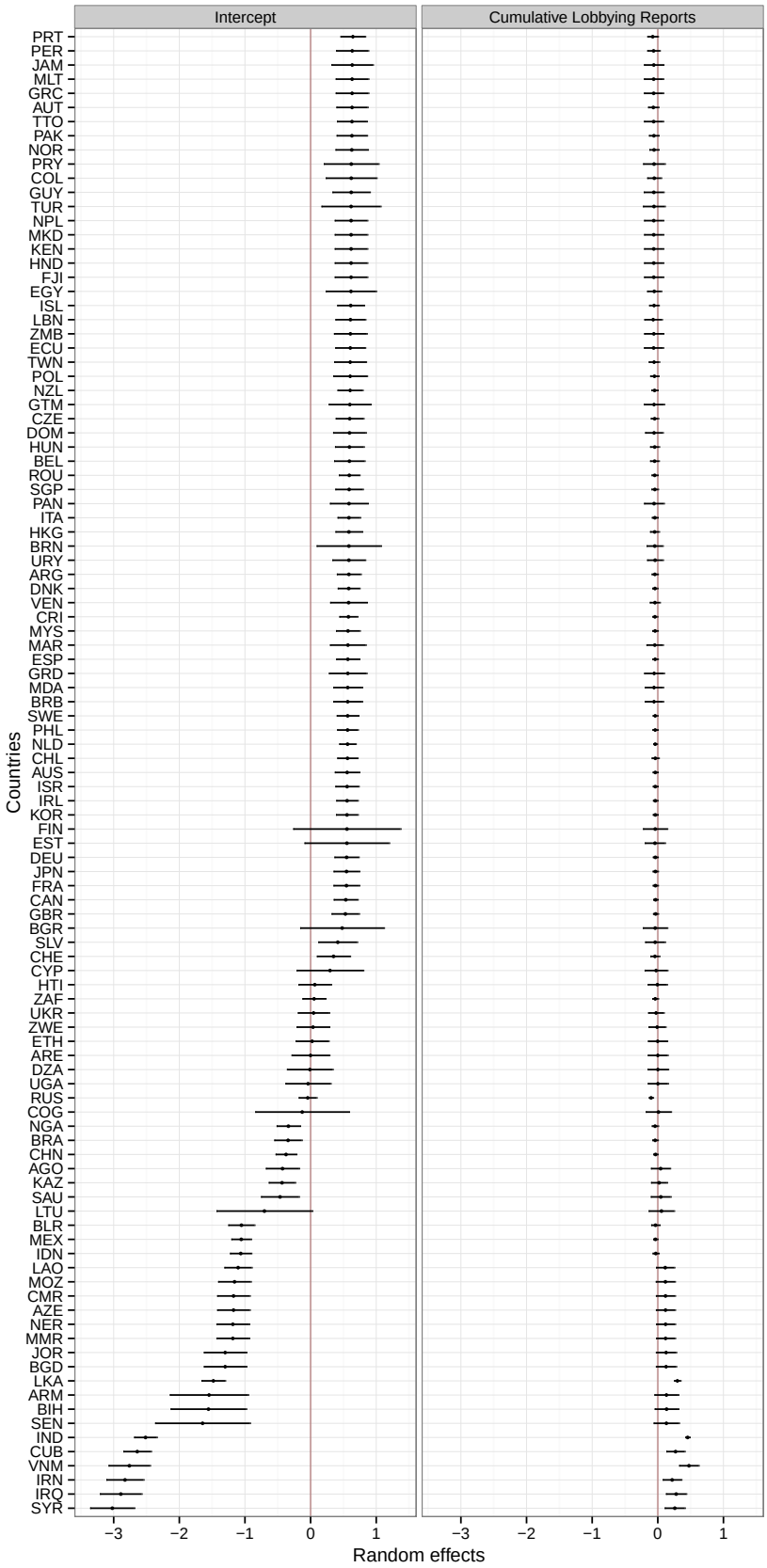

FIG 2.C.1. Fitted Values: Varying Intercept for Countries and Varying Slopes for Cumulative Lobbying Reports.

	Multinomial
Intercept (DOS)	−7.554***
	(1.297)
Intercept (Congress)	−0.322
	(0.262)
L-1 Visa Validity (DOS)	−0.006
	(0.013)
L-1 Visa Validity (Congress)	0.008**
	(0.003)
Firm Size (log, DOS)	0.741***
	(0.215)
Firm Size (log, Congress)	−0.137**
	(0.042)
Num obs.	1846
Log Likelihood	−1296.823
AIC	2605.646

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\wedge}p < 0.1$

TABLE 2.C.4. Lobby Venue: Fitted Multinomial Logit Results. Lobbying both venues as omitted category.

	(1)	(2)
Intercept	−7.626***	−7.775***
	(0.576)	(0.544)
Group Size (Standardized)	−0.350***	−0.763***
	(0.040)	(0.072)
Firm Size	0.653***	0.636***
	(0.025)	(0.024)
Varying Intercept (Industry)	✓	✓
Varying Intercept (Year)	✓	
Varying Intercept (Country)		✓
AIC	8911.376	9437.493
BIC	8950.398	9476.515
Log Likelihood	−4450.688	−4713.747
Num. obs.	18111	18111
Num. groups: industry	55	55
Num. groups: year	14	
Num. groups: country		151

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\wedge}p < 0.1$

TABLE 2.C.5. Collective Action Problems: Fitted Mixed Effects Logit Results

Chapter 3

Bringing the Individual Back In: The Effect of Intra-Company Transfer Visas on the Mobility of Multinational Corporation Professionals and Knowledge Transfers

3.1 Introduction

Knowledge is well known as one of the main sources of productivity and economic growth. For example, Romer (1993) argues how important cross-national variations in economic development can be explained by gaps in ideas. Grossman and Helpman (1990) and Grossman and Helpman (1993) show how growth rates can be determined by the allocation of resources to knowledge-creating activities and that knowledge spillovers play a critical role in making long-run growth sustainable. As a result, understanding how knowledge is intentionally or unintentionally transferred across borders, and how this affects the productivity of individuals, firms, and industries, or the economic growth of countries has received wide attention (Hausmann 2013).

Yet, extant empirical accounts of economic growth tacitly assume that cross-border knowledge transfers take place whenever trade or Foreign Direct Investment (FDI) flows are present (Coe and Helpman 1995; Borensztein, De Gregorio, and Lee 1998; Gorg and Strobl 2005; Pottelsberghe, Potterie, and Lichtenberg 2001; Javorcik 2004). As a result, this "black box" approach of knowledge transfers runs into the danger of confounding growth

effects that stem from trade competition or increasing returns to scale in the case of large multinational corporations (MNCs) with the effects of knowledge transfers. Furthermore, it seemingly eliminates the individual's fundamental role as carrier of knowledge capital.

I challenge the common approach by arguing that the cross-border *mobility* of high skilled individuals, in the particular case of MNC executives and high skilled workers through Intra-Company Transfers (ICT), provide a more precise measure of knowledge transfers. Due to the public goods nature of knowledge capital and problems of incomplete contracts, one of the main reasons why MNCs choose to internalize production processes through FDI over other approaches such as outsourcing is to prevent knowledge leakages and protect ownership advantages of its products (Dunning 1981; Markusen 1995; Helpman 2006). Furthermore, tacit knowledge is oftentimes difficult to transfer and best learned through face-to-face demonstration and training (Markusen and Trofimenko 2009; Hausmann 2013). As a result, MNCs would need to move their own experts in order to transfer (extract) technical, managerial, production related knowledge to (from) foreign subsidiaries. This illuminates a specific mechanism through which high skilled migration policies, and its underlying politics, may affect cross-border knowledge transfers. In particular, I argue that differences in common ICT visa regulations such as validity lengths can lead to variations in bilateral knowledge transfers. This is because visa regulations can change the financial operation costs for multinationals and migration costs for the transferees, which altogether limit the mobility of the high skilled.

To test this theory, I construct a new dataset on US intra-company transfer visa regulations for 172 partner countries from 2000 to 2013. The dataset is created by scraping and parsing current and archived US Department of State websites on visa reciprocity with automated tools. These websites detail the issuance fees, maximum period of visa validity, and number of entries allowed for different types of temporary visitors and nationalities. In particular, I focus on the L-1 visa regulations that govern MNCs' intra-company transfers of their foreign executives and managers (L-1A) or workers with specialized knowledge (L-1B) to their US office.

I then exploit cross-dyad and temporal variations in US-partner L-1 visa validity lengths and admissions to estimate the effect of migration policies on knowledge transfers, proxied by L-1 inflows. I conduct my analysis in two different ways. Cross-sectionally, I estimate the average effect of L-1 validity lengths in a given year across 170 country-dyads by combining Covariate Balancing Propensity Score (CBPS) matching and weighting methods (Imai and Ratkovic 2014) with hurdle count regression models (Mullahy 1986; King 1989). Temporally, I employ the synthetic control method (Abadie and Gardeazabal 2003; Abadie, Diamond, and Hainmueller 2010) to examine the effect of validity length changes in 2006 for India, one

of the largest and fastest-growing sending country for US ICT.

Two main findings emerge. First, there is clear evidence that knowledge inflows, when measured as the count of ICT entries into the US in a given year, are on average higher from partner countries given longer visa validity lengths even when controlling for various confounders. Second, the findings suggest that validity extensions for India in 2006 led to the recent surge of Indian L-1 admissions. Taken together, these findings illustrate the need to broaden common political economy theories and empirical work that focus on the causes and consequences of *permanent* immigration policies, i.e. policies that regulate the movement of individuals for permanent immigration purposes, and consider how and to what extent policies and regulations on human *mobility* shape cross-border economic flows and outcomes.

The chapter is organized as follows. Section 3.2 highlights the limits of extant studies on knowledge transfers. It also discusses why and how common visa regulations can influence cross-border knowledge transfers. Section 3.3 presents the empirical analyses and results. Section 3.4 concludes.

3.2 Theory and Hypothesis

3.2.1 Channels of Knowledge Transfers

Extant economic theories on cross-border knowledge transfers identify two main channels through which transfers may take place: trade and FDI. From a trade perspective, importing goods from R&D intensive countries is assumed to also import the knowledge capital underlying the tradable goods, especially when the goods are used as intermediate inputs of production. For example, Coe and Helpman (1995) assume international knowledge spillovers when they found a positive relationship between a country's total factor productivity and its trade partner's R&D capital stocks.

From a FDI perspective, knowledge transfers are assumed to occur (or have occurred) from the home to the host economy whenever MNC subsidiaries are present in the host economy. This "forward linkage effect" illustrates how technical or managerial knowledge unique to the MNC is transferred from the home to the host economy when local workers are hired and trained by the MNC (Markusen and Trofimenko 2009:120-121). These workers may then contribute to domestic knowledge transfers when they leave the MNC for other local firms or start-up their own companies. For example, Borensztein, De Gregorio, and Lee (1998) assume the existence of forward knowledge transfers when they found a positive relationship between host country FDI inflows and economic growth rates using data for OECD countries. On the other hand, knowledge transfers are also assumed to occur (or

have occurred) from the host to the home economy whenever MNC subsidiaries are present in the host economy. This "backward linkage effects" illustrates how knowledge unique to host country firms is acquired and transferred home by the MNC through joint ventures or through the information exchange between host country customers and home country suppliers (Pottelsberghe, Potterie, and Lichtenberg 2001; Belderbos, Capannelli, and Fukao 2001; Javorcik 2004).[1] For example, Pottelsberghe, Potterie, and Lichtenberg (2001) assume the existence of backward linkage knowledge transfers when they found find a positive relationship between a country's outward FDI to a R&D-intensive country and its own domestic total factor productivity.

Yet, above illustrations of knowledge transfers through trade or FDI are undermined by the following problems. On one hand, acquiring knowledge intensive intermediate goods through imports does not necessarily equate to acquiring the technology underlying it. Oftentimes, acquiring the technology requires individuals with sufficient knowledge of the technology in the first place to reverse engineer it in inter-firm trade. Furthermore, it requires individuals who know how to integrate the intermediate good with other product inputs, produce the final product in an efficient way, and sell it to the most profitable market. Simply put, knowledge transfers acquired through trade are most likely to be limited or basic.

On the other hand, although the *presence* of FDI flows provides a first step towards understanding how knowledge is moved across borders, FDI flows itself is unsuitable to measure knowledge transfers. This is because common measures of FDI flows include not only knowledge-related capital such as equipment, manufacturing rights, and patents, but also other reinvested earnings and intra-company loans, which make FDI measures very noisy.[2] Additionally, it does not capture the extent to which MNC technical or managerial tacit knowledge, the key for production processes, is moved across borders. As a result, measures of FDI are at best only suggestive of *whether* knowledge flows between countries exist. Finally, trying to capture knowledge transfers with trade or FDI measures also run into the danger of confounding growth effects that stem from non-knowledge related trade competition (Smeets 2008) or increasing returns to scale (in the case of large MNCs) (Javorcik 2004) with the effects of knowledge transfers.

I challenge extant theories of knowledge transfers by arguing that the cross-border *mobility* of high skilled individuals, in the particular case of the mobility of MNC executives and high skilled workers through ICT, provide a more precise measure of knowledge transfers. Knowledge can be thought of as a public good (Grossman and Helpman 1990; Stiglitz 1999).

[1] For example, how the Japanese automobile industry may have benefited from FDI into the United States.

[2] See UNCTAD for FDI definitions: http://unctad.org/en/Pages/DIAE/Foreign-Direct-Investment-(FDI).aspx.

On one hand, knowledge is non-rivalrous since an individual or a firm's consumption of a knowledge does not reduce the consumption of the same knowledge for others. On the other hand, knowledge is non-excludable in the sense that it is very difficult to prevent others from learning it. This difficulty is demonstrated by theories of product life-cycles (Vernon 1979) and knowledge spillovers (Gorg and Strobl 2005) that depict how knowledge eventually diffuses internationally and domestically. It is also illustrated by theories of incomplete contract (Helpman 2006) that discuss how final good producers and their suppliers can not sign enforceable contracts that prevent the learning and future usage of knowledge assets necessary for production once they are disclosed.

As a result, MNCs have every incentive to try to prevent knowledge leakages, protect ownership advantages of its products or production processes, and enjoy the fruits of their knowledge advantages as long as possible. This explains why MNCs choose to internalize production processes through FDI over other approaches such as outsourcing in the first place (Dunning 1981; Markusen 1995; Helpman 2006). Furthermore, tacit knowledge for production is oftentimes difficult to transfer and best learned through face-to-face demonstration and training (Markusen and Trofimenko 2009; Hausmann 2013). Taken together, the above shows why it is essential for MNCs to move their own experts in order to transfer (extract) technical, managerial, production related knowledge to (from) foreign subsidiaries.

3.2.2 Migration Policies and Knowledge Transfers

Thinking about the mobility of high-skilled individuals as a more precise measure of knowledge transfers is important in two main ways. First, it illuminates a specific mechanism through which migration policies may affect cross-border knowledge transfers, which has many developmental consequences. Second, it opens up discussions about the extent and ways politics can shape developmental outcomes via migration policies. Overall, I argue that differences in visa regulations on the mobility of intra-company transferees can lead to variations in costs for both multinationals and transferees, which creates further variations in levels of knowledge transfers. Meanwhile, these visa regulations can also be endogenous to geopolitical and domestic concerns.

Imagine five actors that include three countries (countries A, B, and C), one MNC that has subsidiaries in country A and B, and one expert that is employed by the MNC with the nationality B. In terms of preferences, governments in each country are interested in maximizing national interests while also staying in office, the MNC is interested in maximizing profits, and the expert is interested in maximizing welfare. Now, assume that country A exogenously (this assumption can be relaxed later on) increases ICT visa restrictions for

transferees from country B so that they are now more restricted compared to transferees from country C.

From the MNC's perspective, in order to maximize profits it has the following options. In the short run, the MNC can still bring in its expert from country B. However, the duration the expert is allowed to stay in country A and transfer knowledge by training local employees is now limited, which negatively affects the MNC's goals for knowledge transfers. We can thus expect the MNC to reduce knowledge transfers from country B to A since returns are lower while costs are higher. In the long run, the MNC may choose to either set up a subsidiary in country C to utilize the longer ICT visa validity lengths, or consider moving the production process out of country A altogether if costs become too high.[3] Both options, however, are expected to be more costly compared to the short run solutions. Ultimately the option that the MNC chooses will then depend on how knowledge-intensive production is in country A and the costs of transferring knowledge. However, regardless the short- or long-run option, we can expect MNCs to reduce knowledge transfers between country B and A.

From the transferee's perspective, shorter visa validity lengths leads to additional hassles in visa applications and fees. Furthermore, it means more frequent relocating for the transferee and thus incurring higher pecuniary and psychic migration costs (Sjaastad 1962; Todaro 1969; Massey et al. 1993; Borjas 2001) given the same amount of income. For example, these costs can include the material costs of moving, the cost of learning a new language and culture, and the pain of moving away from friends and family. These migration costs are further exacerbated if the transferee has to relocate with spouse and children. This also implies that MNCs may have to incur higher operational costs to compensate for these migration costs if it decides to transfer its executives and high skilled professionals. Additional visa restrictions on ICT mobility such as visa issuance fees and number of entries would further increase the costs for MNCs and limit the effectiveness of dyadic knowledge transfers. Overall, more relaxed (stricter) ICT visa regulations are thus expected to reduce (increase) costs for both MNCs and transferees, which leads to higher (lower) levels of knowledge transfers all else equal.

Meanwhile, visa regulations on *mobility* (visa validity lengths, issuance fees, or number of entries allowed) are oftentimes made at the discretion of the ministry of foreign affairs and not constrained by the legislature. As a result, they usually enjoy higher flexibility in influencing cross-border flows of the high-skilled compared to visa regulations on *entry* (caps or quotas) that have attracted most of the attention in current high skilled immigration policy debates. For example, while the widely debated H-1B visa in the US is currently capped annually at

[3]This further assumes experts in country C hold the same knowledge as the expert in country B.

65,000 according to Title 2 Section 214 of the Immigration and Nationality Act, decisions on mobility regulations are made by the State Department in consultation with the Department of Homeland Security.[4] Visa regulations on mobility may thus be endogenous to a country's international-level strategic interests or domestic-level economic interests as demonstrated in the quote below:

> "The (State) Department, in consultation with the Department of Homeland Security makes determinations to increase visa validity. With increases, the Department considers whether a foreign government has agreed to offer similar visa validities for equivalent categories. In addition, the Department considers whether increasing visa validity is consistent with the overall strategic goals of the bilateral relationship."[5]

This suggests that bilateral visa mobility regulation outcomes are no less political than permanent immigration policies. For example, longer validities can be used as a preferential treatment to promote overall strategic goals of the bilateral relationship while shorter validities can in effect be equivalent to non-tariff barriers or even economic sanctions in trade or investment. Factors that may influence the assignment of visa regulations are thus expected to include variables capturing aspects of economic dependence, domestic lobbying, country similarity or closeness, and security concerns. Meanwhile, these "pretreatment" covariates may also influence the extent of dyadic knowledge transfers, which can lead to biased estimates of visa regulation effects if not accounted for. Figure 3.1 below summarizes the relationship between visa regulations, its underlying politics, and the outcome of interest knowledge transfers. Details of my treatment assignment model will be illustrated in Section 3.3.1.

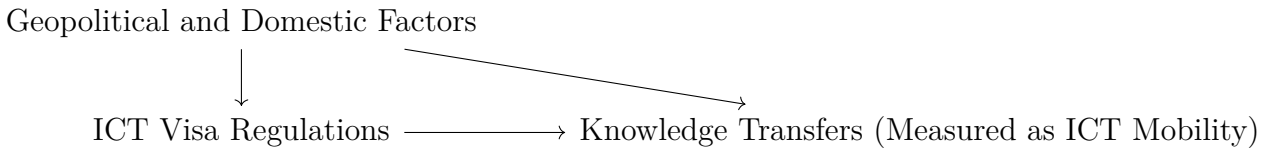

Fig 3.1. Causal Directed Acyclic Graph (DAG)

[4]There are currently no annual caps on the L-1 visa in the US.
[5]Personal correspondence with the US Department of State.

3.3 Empirical Analysis

In this section, I present empirical results that establish the effects of visa regulations on the mobility of high-skilled workers who hold valuable knowledge capital. Section 3.3.1 introduces the dataset used in the analysis. Section 3.3.2 examines the average effect of intra-company transfer visa validity lengths on L-1 visa holders from U.S. partner countries. Section 3.3.3 analyzes the effect of intra-company transfer visa validity length extensions in 2006 for India, one of the largest U.S. source of MNC professionals.

3.3.1 Data

Intra-Company Transfer Visa Regulations

One main contribution of this chapter is compiling an original data set on U.S. ICT visa regulations for 170 partner countries from 2000 to 2013. I collected the data by scraping and parsing the tables and text of 3010 current and archived US Department of State (DOS) webpages on visa reciprocity rules using automated tools. These webpages detail the issuance fees, maximum period of visa validity, and number of entries authorized for different types of temporary visitors and nationality. In particular, I focus on the L-1 visa schedules that regulate intra-company transfers of foreign executives and managers (L-1A) or workers with specialized knowledge (L-1B) to a MNC's US office.[6] Among the three measures of visa restrictions: validity length, issuance fees, and number of entries allowed, I focus in this chapter on validity lengths. This is because validity lengths are most important for the act of knowledge transfers. Furthermore, it also shows wider variation compared to the latter two.[7]

Most variation in L-1 visa validity lengths is cross-sectional as shown in Figure 3.1. In particular, L-1 visa validity lengths in 2013 vary from one month (Libya) to three months

[6]Employees are required to have worked for the company for at least one year to be eligible for transfers.

[7]To transfer an employee to the U.S. on the L-1 visa, firms need to first file a petition. These petitions are usually approved by U.S. Citizenship and Immigration Services (USCIS) with a maximum initial stay of three years. L-1A visas can be extended to 7 years maximum, while L-1B visas can be extended to 5 years maximum in two-year increments after the initial three year stay. However, the validity period of the L-1 visa in effect depends on the State Department's reciprocity rule. Fig 3.A.1 in Appendix 3.A shows a screenshot example of a subset of visa restrictions for India. Although current visa restrictions for all temporary visitors and nationalities can be easily accessed on the State Department website (`http://travel.state.gov/visa/fees/fees_3272.html`), acquiring data for past visa restrictions is difficult since the State Department does not provide past visa reciprocity rules on their website. As a result, I turn to `archive.org`, an internet archive website that regularly crawls and saves numerous internet webpages, to acquire the archived data. Given that `archive.org` saves pages exactly as they are, there should be no concerns about the accuracy of the archived data. The earliest year `archive.org` began to regularly crawl DOS webpages on visa regulations was 2000, which is why my dataset begins in 2000.

(Afghanistan and Iran), one year (Burma and Mexico), two years (Brazil and China), four years (Switzerland), and five years (Germany and Japan). Most countries, however, enjoy the maximum 60 month L-1 visa validity length.

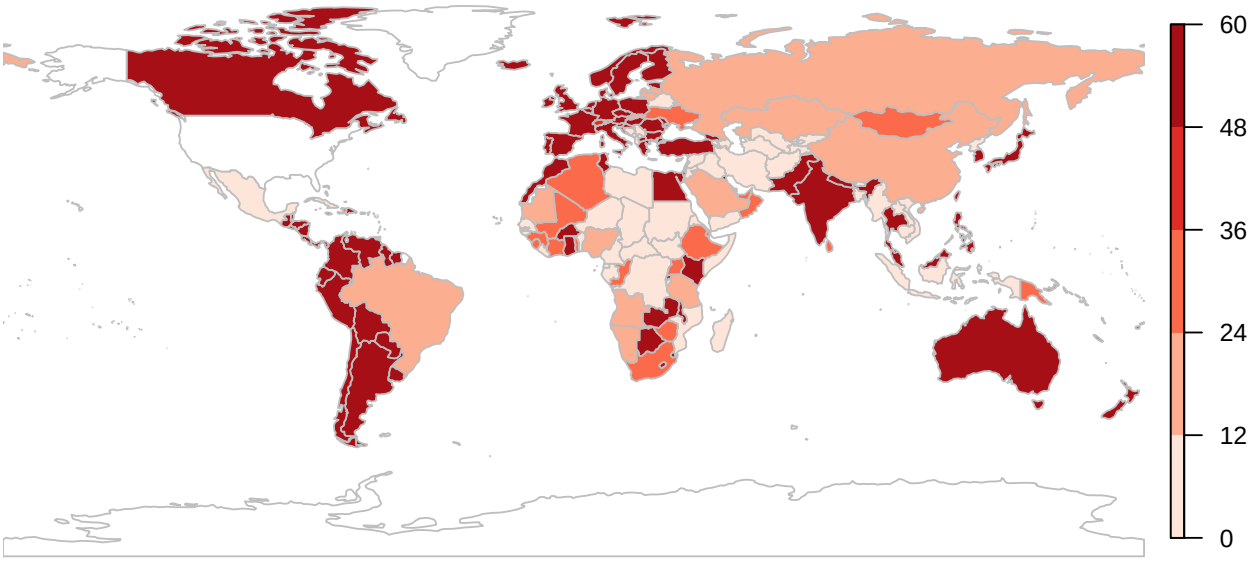

FIG 3.1. L-1 Visa Validity Lengths for U.S. Partners in 2013. L-1 visa validity lengths vary from one month (Libya) to three months (Afghanistan and Iran), one year (Burma and Mexico), two years (Brazil and China), four years (Switzerland), and five years (Germany and Japan).

Some countries have experienced changes in L-1 visa validity lengths as shown in Figure 3.2. Most of these countries experience *increases* in validity lengths. For example, India's L-1 visa validity increased from 12 months to 60 months in 2006, which I exploit in Section 3.3.3. However, some countries such as Russia, Slovakia, and Uzbekistan actually experience reductions in visa validity length during this period.

Given the distribution of the validity lengths, I operationalize L-1 visa validity lengths as a dichotomous variable: sixty months coded as one and otherwise zero.[8]

The Mobility of Intra-Company Transferees and Knowledge Transfers

Following the theoretical argument, I employ the mobility of MNC professionals between two countries as a dyadic measure of knowledge transfers. Data on MNC professionals rely on the DHS *Yearbook of Immigration Statistics*, which provides annual L-1 visa admissions into the U.S. by transferee sending country since 1997.[9] Extant empirical work on migration are

[8]In my empirical analysis, I also employed an ordinal measure of validity lengths with 4 levels (values): 1 for lengths of 1-12 months, 2 for 24 months, 3 for 36 months, and 4 for 48 and 60 months. Since substantive results are similar, I omit this alternative measure to conserve space and simplify interpretation of the results.

[9]See http://www.dhs.gov/yearbook-immigration-statistics.

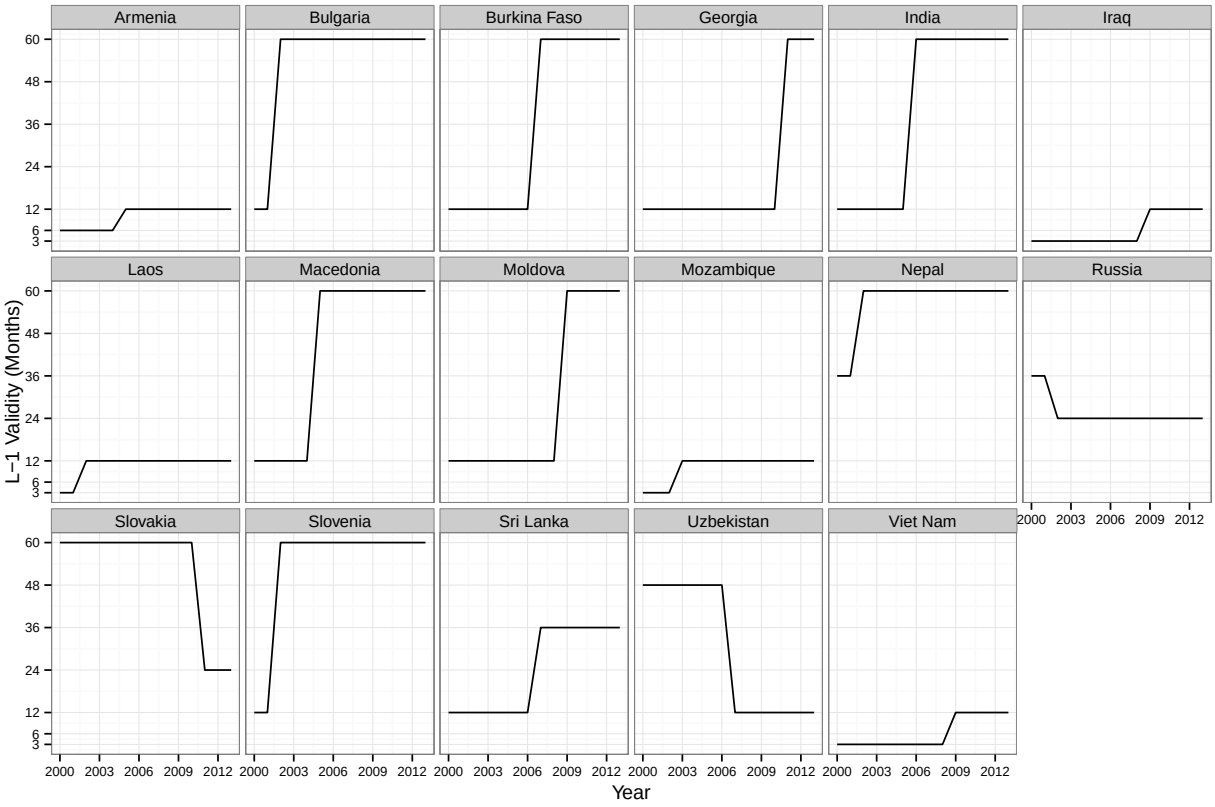

FIG 3.2. Countries with L-1 Validity Length Changes, 2000 - 2013.

commonly concerned of how admissions data inflates measures of migration flows. Yet, extant studies are concerned because they are interested in the number of *individuals* entering a country in a given year and not frequency. I argue that L-1 admissions data is in fact a more appropriate measure of cross-border mobility and knowledge transfers since it counts the total number of *times* L-1 visa holders enter the US within a given time period. Ideally, one would like more disaggregated data that details the number of times *each* MNC professional moves between home and host country in a given year. Higher counts would thus suggest higher levels of knowledge transfers between the countries. Yet, as with the main obstacle in all empirical work on migration, such data is not available since countries do not track the movement of individuals across borders. Furthermore, such data would be difficult to obtain due to privacy concerns even if they exist.

Figure 3.3 shows how L-1 visas have grown compared to the other widely known high-skilled temporary immigration H-1B visa. It shows that L-1 admissions have surpassed H-1B admissions since 2009, and the increasing importance intra-company transfers in high skilled immigration debates.

Figure 3.4 shows top twenty L-1 visa sending countries and how their total L-1s change

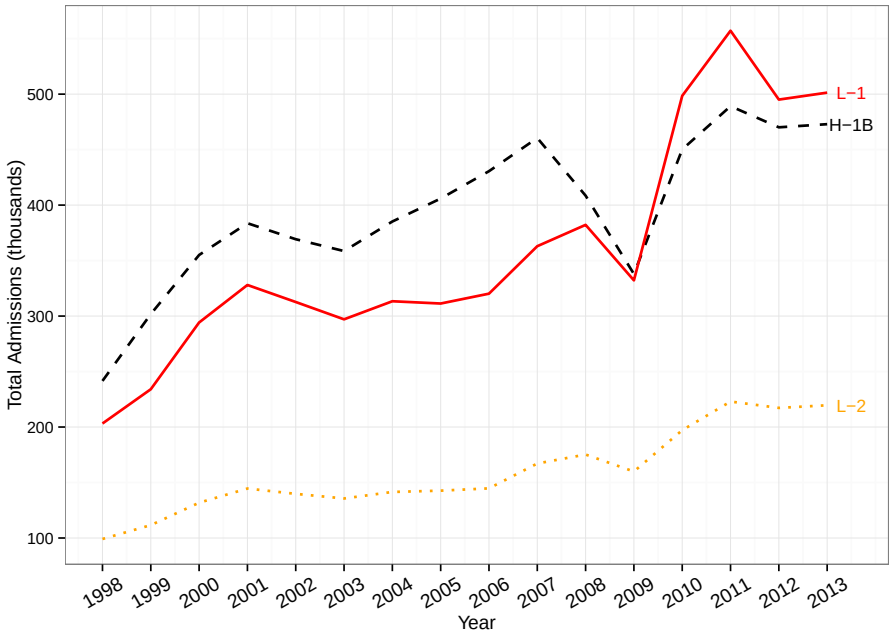

FIG 3.3. Trends in Visa Admissions, 1998 - 2013. Note that admissions for L-1 visa have surpassed admissions for the most widely discussed H-1B visa in 2009; becoming the largest source of high-skilled temporary migrants.

across time. As expected, Organisation for Economic Co-operation and Development (OECD) countries such as the Canada, France, Germany, Japan, and United Kingdom are among the top sending countries. Yet, developing countries such as India and Mexico are also top senders, with India climbing to second largest (behind Canada) in 2013. However, Canadian and Mexican L-1 admissions are likely to be inflated by DHS counting changes for land-based admissions after 2009.[10]

Visa Regulation Assignment Model

As discussed in Section 3.2, pretreatment covariates capturing aspects of economic dependence, domestic lobbying, dyad similarity or closeness, and security concerns, may influence both the assignment of visa regulations on mobility and the outcome of interest knowledge transfers, which can lead to biased estimates of visa regulation effects if not accounted for. Therefore, I illustrate the details of covariates included in my treatment assignment model below.

Economic dependence. Given the economic benefits of knowledge transfers through

[10]In particular, new technology installed along U.S. Southwest and Northern borders records land admissions previously excluded from I-94 data systems, which began in 2005 and was completed in 2010 (Mathews 2012; Monger 2012).

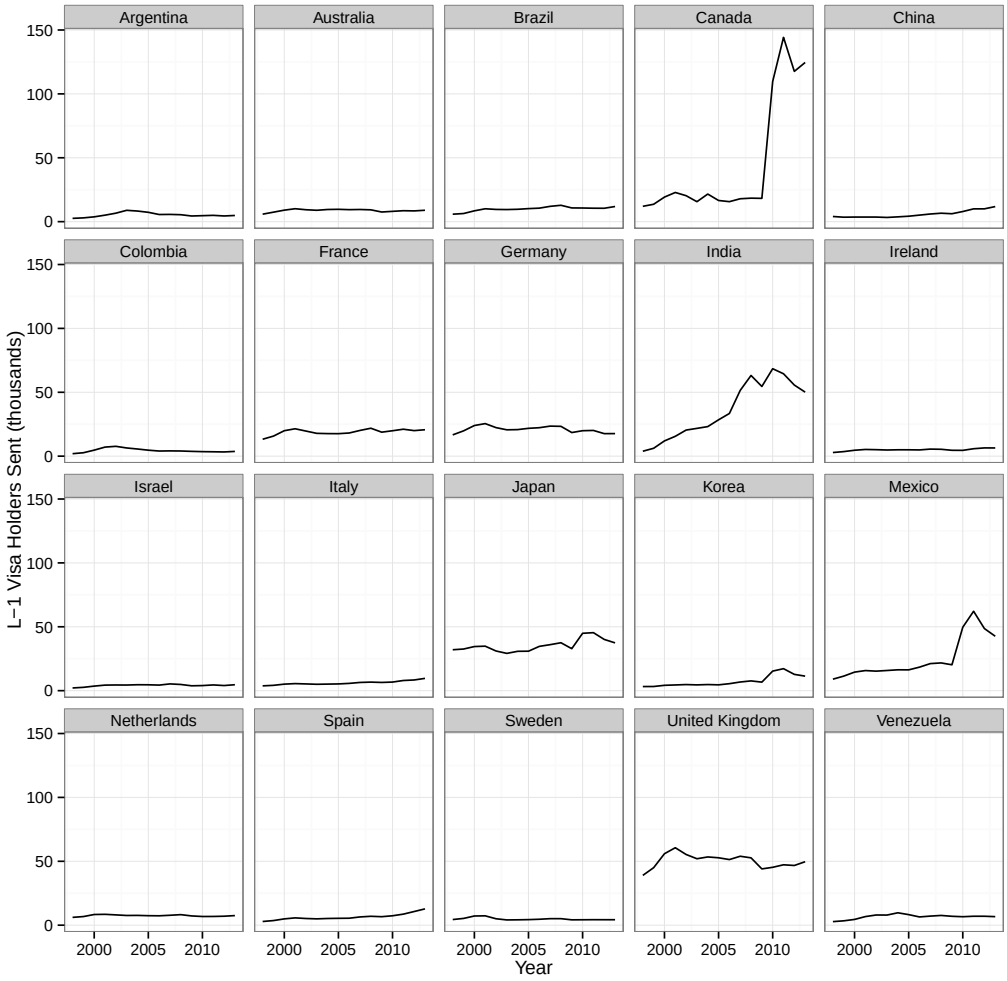

FIG 3.4. Top 20 L-1 Visa Sending Countries, 1998 - 2013

both forward and backward linkages, it is feasible that the DOS has incentives to increase visa validity lengths for partner countries the US is highly economically dependent on. No only would this contribute to potential domestic productivity growth via forward linkage mechanisms, but may also contribute to the productivity growth in the partner country via backward linkage mechanisms. Taken together, more relaxed visa regulations would strengthen bilateral relationships consistent with DOS's goals. To capture the extent of economic dependence, I operationalize economic dependence on two different dimensions: *de facto* vs. *de jure* and trade vs. FDI.

For *de facto* economic dependence, I construct measures of US trade dependence and US FDI dependence with a partner country in a given year. `US Trade Dependence` is constructed as total trade (exports and imports of goods) divided by real US GDP using data from UN Comtrade UN Comtrade (2013), Penn World Table (PWT) 8.0 (Feenstra, Inklaar,

and Timmer 2013), and Taiwan National Statistics Taiwan National Statistics (2013). `US FDI Dependence` is constructed as total absolute FDI flows (inflows and outflows) divided by real US GDP using data from OECD.Stat OECD (2013) and PWT 8.0.[11]

For *de jure* economic dependence, I employ measures of formal economic international agreements. This includes Free Trade agreements (`FTA`), whether the US has a FTA in force with partner country in a given year, and Bilateral Investment Treaties (`BIT`), whether the US has a BIT in force with partner country in a given year. Data for the former relies on the Office of the United States Trade Representative (USTR) USTR (2013) while data for the latter relies on United Nations Conference on Trade and Development (UNCTAD) UNCTAD (2013).

Domestic Lobbying. As assumed in the theory, governments are interested in maximizing both national interests while also staying in office. This implies that in addition to international-level economic interests, domestic actors and their preferences may influence the assignment of visa regulations to partner countries via mechanisms such as lobbying. Furthermore, visa validities, unlike immigration quotas, are decided by the DOS and not constrained by the legislature. This reduces the number of veto players involved (Tsebelis 1995), the complexity and costs of lobbying for interest groups, and makes visa regulation decisions easier to lobby compared to influencing bill passage processes. I identify two sources of domestic preferences on variations in visa regulations: firms and immigrant groups.

First, MNCs that have production processes in the US and need to bring in their proprietary knowledge via their executives and skilled workers have incentives to reduce the transaction costs of visa regulations. It is thus likely that MNCs with larger production processes or operations in the US hold both more resources and higher stakes to lobby for relax visa regulations. Along similar lines but aggregated to the dyad level, larger partner country US affiliate presence should thus be more influential in dyadic visa restriction decisions than partner countries with smaller US affiliate presence.[12] Therefore, I capture the size of partner country US affiliate presence with U.S. Bureau of Economic Analysis (BEA) BEA (2013) data on total `US Affiliate Employment`.

Second, MNCs may choose to "vote with their feet" instead of lobbying, and higher firm mobility has thus been shown to reduce domestic support for open immigration and lead to stricter immigration policy (Peters 2014). It is feasible that such effects apply to visa regulations on the mobility of MNC transferees as well since MNCs can choose to set up a

[11] I take the natural log for US trade dependence while conducting the Inverse Hyperbolic Sine (IHS) transformation for US FDI dependence. This is because the latter includes values of zero and thus $log(0)$ is undefined. The IHS transformation allows interpretations exactly the same as the natural log but allows values of zero (Burbidge, Magee, and Robb 1988).

[12] On the other hand, more MNCs may increase collective action problems on lobbying.

subsidiary in a different US partner country that enjoys easier ICT if costs are too high or lobbying efforts were not successful. This implies that partner countries with higher capital openness and thus lower costs of FDI may be attractive for MNCs to move to, which reduces support for dyadic open "mobility" policies in the US. On the other hand, it would also be essential that workers in the alternative partner country be skilled enough if the MNC's goal is to facilitate knowledge transfer. Taken together, I employ `Capital Openness`, `Tertiary Labor`, and their interaction `Capital Openness*Tertiary Labor` to capture the effect of dyadic firm mobility on visa restriction decisions. Capital openness data relies on Chinn and Ito (2013) and tertiary labor data relies on World Development Indicators (WDI 2013).

Third, immigrants groups are shown to maintain ties with their sending countries. Trade consumption preferences and contract enforcement advantages (Rauch and Trindade 2002; Law, Genç, and Bryant 2013), informational advantages in investment (Leblang 2010; Foley and Kerr 2011), or dual citizenship advantages (Leblang 2013) give immigrant groups incentives to remove barriers that inhibit the free movement of goods, capital, and people between dyads. As a result, immigrants groups are on average expected to prefer more relaxed visa restriction on the high skilled moving between their host and sending country. Furthermore, larger immigrant groups are expected to be more influential on ICT visa regulations through the same lobbying mechanism illustrated above. I capture such influence by measuring the `Migrant Stock` of partner country-born population in the US using data from (OECD 2013).[13]

Dyad Similarity or Closeness. Similarity or closeness between two countries may contribute to more relaxed visa regulations through mechanisms of lowering transaction costs, common ideas, or psychological tendencies. For example, democracies may be more likely to give other democracies more relaxed visa regulations due to their common support for liberal ideas (see original argument on explaining democratic peace Owen 1994) or due to in-group psychology and trust (Mercer 2005). To capture this effect, I measure `Regime Type` using the Revised Combined Polity Score from Polity IV Marshall, Jaggers, and Gurr (2012). In a similar vein, the experience former colonies and their metropole share may lead to common languages that contribute to either lower transaction costs of communication or building an in-group trust, which is expected to lower dyadic visa regulations. Additionally, dyads that are closer to each other in terms of distance are on average more similar in ethnicity, culture, and languages. Furthermore, they oftentimes have more economic transactions. More relaxed visa regulations are thus expected to reduce the costs of these economic transactions. I employ CEPII (2011) data on `Colonial Relationship`, `Common Language`, and `Distance` to capture these effects. Finally, similar income levels can influence visa restriction

[13]Migrant stock is IHS transformed due to justification mentioned previously.

by signaling similar living standards or in-groups. Higher partner country income levels may also signal political, economic stability, and "safeness," which is expected to lower receiving countries visa regulations towards the partner. I use data on `Real GDP per capita` from PWT 8.0.[14]

Security Concerns. Security concerns have been on the rise in the US since September 11 terrorist attacks in 2001. It is thus likely that mitigating security concerns are top priority when the DOS consults the DHS prior to changes in visa regulations. I use Global Terrorism Database (GTD 2013) data and construct measures of annual `Terrorist Attacks` in partner country and `Cumulative Terrorist Attacks` in partner country since 1998 to operationalize short run and long run security concerns.[15]

Further variable details are discussed in Appendix 3.B. In particular, Table 3.A.1 summarizes variable operationalization and data sources. Table 3.A.2 shows descriptive statistics for the variables. Figure 3.A.2 illustrates pair-wise correlations for covariates.

3.3.2 Cross-Sectional Analysis

In this section, I test cross-sectionally the hypothesis that countries given more relaxed ICT visa regulations on average contribute to higher levels of knowledge transfers. Following the theory in this chapter, I focus on the average effect of US L-1 visa validity lengths. Additionally, I use L-1 admissions as a proxy measure for the mobility of MNC professionals and thus the level of knowledge transfers.

Fig 3.5 shows how L-1 admissions into the US are on average higher when a partner country is given longer L-1 visa validity lengths. More specifically, the left panel shows that this positive relationship exists when validity lengths are increased from 1 to 24 months or 48 to 60 months. Interestingly, an increase in validity lengths from 24 to 36 month is actually associated with lower L-1 admissions. The right panel shows how this positive relationship is consistent with a dichotomized measure.

Models and Methods

To further examine this, I fit hurdle count models to my data in three different ways: (1) a straight-up hurdle model, (2) a hurdle model pre-processed with the CBPS weighting method, and (3) a hurdle model pre-processed with the CBPS matching method.

A count model is appropriate here because the outcome of interest, knowledge transfers measured as the number of times holders of L-1 visas enter the US in a given year, consists

[14] I take the natural log for both distance and real GDP per capita.
[15] Both measures are IHS transformed due to justification mentioned previously.

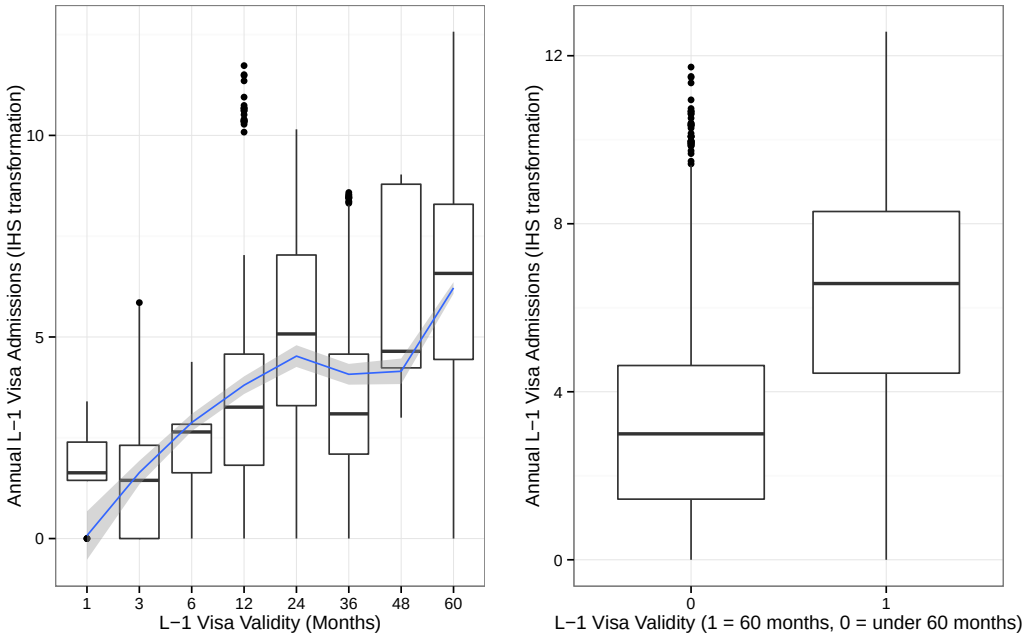

FIG 3.5. L-1 Visa Validity Lengths and Annual L-1 Admissions. This figure shows how L-1 admissions into the US are on average higher when a partner country is given longer L-1 visa validity lengths. The left panel plots validity lenths by months while the right panel plots the dichotomized version of validity lengths.

non-negative integers.[16] A hurdle count model is more appropriate than a normal Poisson model since I argue that ICT is driven by two separate data generating processes (DGP) (see Mullahy 1986; King 1989). The first process governs whether a MNC has establishments in both the US and a partner country in the first place, in other words where MNCs can source transferees. A second process related to firm and individual-level visa mobility regulation costs governs the number of intra-company transferees sent from sending to receiving country.[17] Given the two processes, it is very likely that while some partner countries never send ICT to the US, other countries always have. Furthermore, once the hurdle of MNC subsidiary existence is overcome, the total number of dyadic L-1 admissions is likely to cluster in time and change in response to the levels of transaction costs. The above premise is supported by my admissions data, which shows up to 10% zeros and clustering in dyadic

[16]Transforming this measure linearly by taking the natural log is not appropriate because some dyadic L-1 admissions are zero. Furthermore, transforming the outcome to some linear measure of admission *rate* by dividing admissions by partner country population or size of high skilled labor force is also inappropriate. This is because most L-1 visa holders are allowed *multiple* entries into the US and thus the "potential" size of the denominator is unclear and incomparable across countries.

[17]It is also possible in the long run that the second process may affect the first process since subsidiary location decisions may be influenced by the easiness to source talent.

L-1 admission counts (54.52% have less than 100 annual L-1 admissions). Since excess zeros and overdispersion can bias Poisson model estimates, I fit a hurdle model that combines a logit component (right-censored at y = 1) and a negative binomial component (that is left-truncated at y = 1) to address both issues. More formally, the model can be expressed as follows:

$$f_{hurdle}(y|\mathbf{X}, \boldsymbol{\beta}_{logit}, \boldsymbol{\beta}_{nb}, \boldsymbol{\theta}_{logit}, \boldsymbol{\theta}_{nb}) = \begin{cases} f_{logit}(0|\mathbf{X}, \boldsymbol{\beta}_{logit}, \boldsymbol{\theta}_{logit}) & \text{if } y = 0, \\ (1 - f_{logit}(0|\mathbf{X}, \boldsymbol{\beta}_{logit}, \boldsymbol{\theta}_{logit})) \cdot \frac{f_{nb}(y|\mathbf{X}, \boldsymbol{\beta}_{nb}, \boldsymbol{\theta}_{nb})}{1 - f_{nb}(0|\mathbf{X}, \boldsymbol{\beta}_{nb}, \boldsymbol{\theta}_{nb})} & \text{if } y > 0 \end{cases} \tag{3.1}$$

where f_{logit} and f_{nb} denote statistical models implied by logit and negative binomial models, respectively, and f_{hurdle} denotes the full model that combines the two. y denotes L-1 admission counts in a given year. When $y = 0$, the logit model is employed to model the probability of zero vs. positive counts. When $y > 0$, the negative binomial model is employed to model the positive counts. $\boldsymbol{X}$ is a vector that includes my treatment L-1 validity length, pretreatment covariates mentioned in Section 3.3.1, and year fixed effects. Note that I include the same set of covariates in both submodels. $\boldsymbol{\beta_{logit}}$ and $\boldsymbol{\beta_{nb}}$ are vectors of coefficients for covariates in the logit model and negative binomial model, respectively. $\boldsymbol{\theta_{logit}}$ and $\boldsymbol{\theta_{nb}}$ are vectors of other parameters for each model including the dispersion parameter in the negative binomial model. The denominator in the second line of equation (3.1) scales the distribution of positive counts to ensure that overall probability sums to one.

I then combine propensity score weighting and matching methods with the above parametric hurdle count regressions to reduce the model dependency of my results (Ho, Imai, King, and Stuart 2006; Stuart 2010). However, it is well known that propensity scores must be estimated and slight misspecifications of the parametric propensity score model (i.e. treatment assignment model) can lead to serious bias in estimated treatment effects (Smith and Todd 2005; Kang and Schafer 2007; Imai and Ratkovic 2014). Therefore, applied researchers have previously repeated the process of tweaking propensity score model specification and then checking the covariate balance hoping to find the appropriate model specification. In this chapter, I rely instead on Imai and Ratkovic (2014)'s CBPS methodology, which models the conditional probability of treatment assignment while also maximizing the covariate balance in a single model. [18]

[18]Note that while the use of CBPS weighting and matching methods reduce my reliance on strong parametric and model specification assumptions for my outcome and treatment assignment models, my results still rely on the identification assumption of "no omitted variables" in the treatment assignment model. Additionally, I still rely on the stable unit treatment value assumption (SUTVA), which implies that potential outcomes for a given unit do not change with the treatments assignment of any other units and that all units receive same versions of the treatment (Rubin 1978). I argue that both assumptions are defensible.

Optimal CBPS are estimated by fitting a logistic regression with the outcome as my dichotomous measure of L-1 validity lengths. The covariates in this treatment assignment model include all variables mentioned in Section 3.3.1 and year fixed effects. For models using CBPS weighting combined with hurdle count regression, I balance covariates between treatment and control groups by weighting observations in the hurdle count regression according to their estimated CBPS and optimal weights.[19] For models using CBPS matching combined with hurdle count regression, I balance covariates by conducting 1-to-3 nearest neighbor matching with replacement based on each observation's CBPS. Each approach has its strengths and weaknesses thus I choose to implement both in the chapter. The weighting procedure preserves all observations but variances for estimated effects are known to be very large when estimated propensity scores are extreme (i.e. close to 0 or 1) (Stuart 2010). The matching procedure throws out extreme observations that do not find good comparisons, i.e. observations outside of "common support," which helps obtain more accurate effect estimates by reducing variances but also changes the population of interest.[20]

Results

Table 3.1 shows the treatment assignment model fitted results using the CBPS method. As expected, partner countries that are more similar or close to the US are more likely to receive longer visa validity lengths. In particular, partner countries that are more democratic, had colonial relationships with the US, have common languages with the US, or have higher GDP per capita, are all statistically significantly associated with higher probabilities of receiving 60 month visa validity lengths. Results for security concerns are mixed. Partner countries with a long history of terrorist attacks, captured by cumulative terror attacks since 1998,

First, Given DOS' clear response on how strategic concerns influence treatment assignment, I include a relatively comprehensive list of potential international and domestic-level covariates covering both economic and security issues. Even if a potential confounder is omitted, it should be fairly well correlated with the pretreatment covariates I include. Second, while changes in L-1 validity lengths for one partner country may affect the outcome of L-1 admissions into the US from other partner countries *in the long run* (assuming MNCs decide to expand subsidiaries to alternative countries), this violation of SUTVA should be less serious in the short run. Furthermore, many other factors are considered when MNC make decisions about FDI location.

[19] More technically, I extract the vector of optimal Horvitz-Thompson weights calculated from the estimated CBPS and use it to weight observations in the hurdle count regression.

[20] Hurdle count models are fitted with the **R** package `pscl` (Zeileis, Kleiber, and Jackman 2008). The CBPS method is implemented with the **R** package `CBPS` (Ratkovic, Imai, and Fong 2013). Nearest neighbor matching is conducted with the **R** package `MatchIt` (Ho, Imai, King, and Stuart 2011). To address issues with missing data, I create ten multiply imputed datasets using the **R** package `Amelia II` (Honaker, King, and Blackwell 2011), implement CBPS weighting and matching combined with hurdle regressions for each dataset, and combine the results using Rubin's Rules (Rubin 1987). The 10 multiply imputed datasets were created by implementing Amelia in parallel on University of Virginia's ITS Linux Cluster. See `https://github.com/stevenliaotw/parallel` for details.

are statistically significantly less likely to receive 60 month visa validity lengths as expected. However, having more terrorist attacks in a given year is in fact associated with higher probabilities of receiving longer validity lengths. The data shows that this result is mostly driven by India, Pakistan, Philippines, and Colombia, which had high levels of terrorist attacks in a given year, but were also authorized 60 month L-1 validity lengths. However, these countries are also close to the US in terms of colonial relationship (Philippines) and common language (India, Pakistan, and Colombia). Given that validity lengths do not change much across time (slow to adjust), this suggests that long run security concerns are important for determining L-1 visa validity lengths, while the short run positive association between terrorist attacks and validity lengths may be confounded by measures of closeness more relevant for MNC operations. Finally, in contrast to my expectations, I find no evidence supportive of relationships between measures of economic dependence and validity lengths, or domestic lobbying and validity lengths.

Turning to my outcome model results, Figure 3.6 plots the first difference effects of L-1 validity lengths on the predicted probability and count of L-1 admissions across models.[21] The right panel shows that, depending on different propensity score methods, dyadic L-1 admissions into the US in a given year is on average 13 - 29 higher from partner countries given the maximum 60 months even when controlling for various confounders. This result is statistically significant, consistent across models, and is substantively significant given that more than half of the dyads in my data have less than 100 annual L-1 admissions. It supports my argument that longer ICT visa validity lengths help facilitate the mobility of MNC executives and high skilled workers and knowledge transfers. On the other hand, the left panel shows that increases in L-1 validity lengths does not consistently show a statistically significant increase in the probability of L-1 admission existence. This is expected as it is difficult for MNCs to utilize changes in ICT restrictions in the short run by expanding subsidiaries to alternative countries.

3.3.3 Temporal Analysis Focusing on India

So far, I have shown that most variations in L-1 validity lengths exist cross-sectionally (Section 3.3.1). Furthermore, I have provided cross-sectional evidence that countries with longer

[21] Fitted result details are summarized in Table 3.B.2 of Appendix 3.B. More precisely, first differences here are calculated as the change in the expected value (probability or count) when the treatment is changed from zero to one while all other covariates are held constant at their mean (continuous covariates) or mode (discrete covariates). Additionally, I set the year as 2005 given that year fixed effects were included. Unfortunately, the current version of the **R** package `Zelig` (Imai, King, and Lau 2007) does not implement first difference simulations for hurdle models. Therefore, I implement first differences with my own code following King, Tomz, and Wittenberg (2000)'s method. Please see Table 3.B.1 and Table 3.B.3 in Appendix 3.B for covariate balance and validity length first difference details, respectively.

	CBPS Model
Intercept	−6.855***
	(1.512)
US Trade Dependence (log)	0.024
	(0.067)
US FDI Dependence (asinh)	−1.612
	(1.413)
FTA	0.240
	(0.562)
BIT	0.235
	(0.262)
US Affiliate Employment (asinh)	0.033
	(0.074)
Capital Openness	0.115
	(0.181)
Tertiary Labor (log)	−0.110
	(0.073)
Capital Open.*Tert. Labor (log)	−0.002
	(0.032)
Migrant Stock (asinh)	0.034
	(0.075)
Regime Type	0.133***
	(0.020)
Colonial Relationship	14.468***
	(0.581)
Common Language	2.004***
	(0.191)
Distance (log)	−0.079
	(0.216)
Real GDP per capita (log)	0.800***
	(0.099)
Terrorist Attacks (asinh)	0.204**
	(0.078)
Cumulative Terrorist Attacks (asinh)	−0.249***
	(0.063)
Num obs.	2578
Log Likelihood	−913.683
J-statistic	3.233

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\wedge}p < 0.1$

TABLE 3.1. Fitted CBPS Model Results. Dichotomized L-1 validity length as outcome of interest. Year fixed effects included but omitted for presentation purposes.

L-1 visa validity lengths allow higher ICT mobility and L-1 visa admissions even when accounting for various confounders (Section 3.3.2). Yet, although year fixed effects were included to address concerns about unobserved *time-invariant* sending country or dyadic characteristics, an array of time-varying pretreatment covariates were included to mitigate concerns about omitted *time-varying* pretreatment covariates, and CBPS methods were employed to mitigate concerns about treatment assignment model misspecifications, the results still rely on the assumption of no unobserved time-varying pretreatment covariates. Additionally, since year fixed effects were included in the hurdle models above, I can not say whether the positive effects of longer L-1 visa validity lengths hold temporally instead of cross-sectionally. Do changes in L-1 visa validity lengths affect countries temporally?

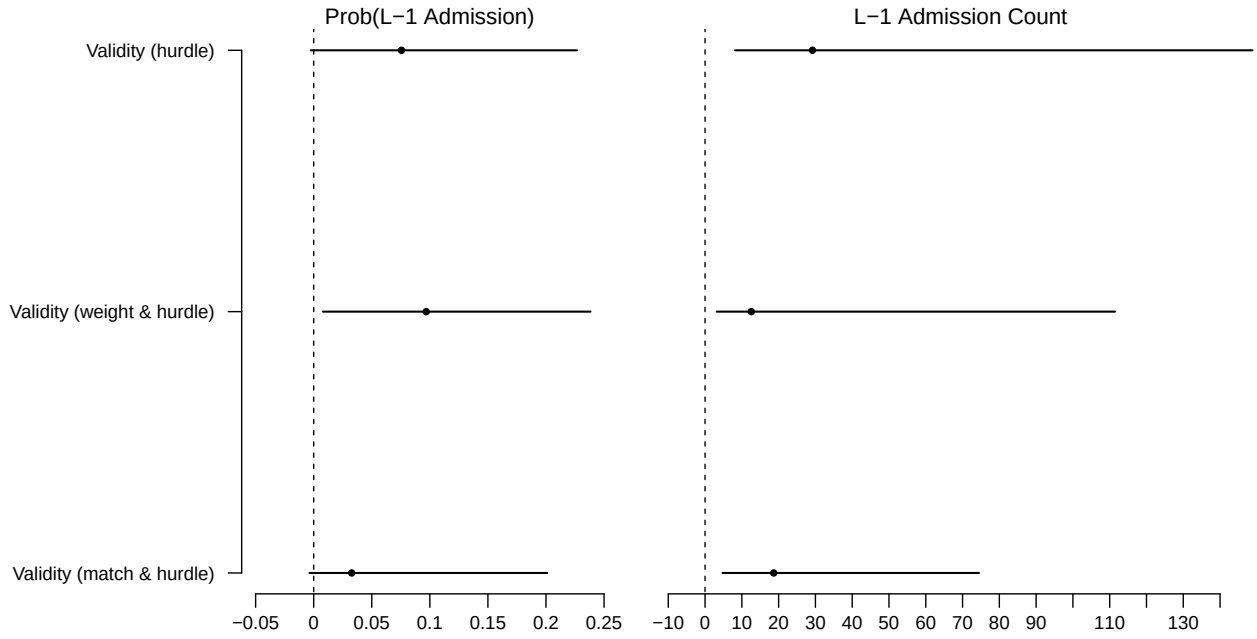

FIG 3.6. First Difference Probabilities and Count. This figure plots the first difference predicted probability and count of L-1 admissions across models when varying L-1 visa validities. The right panel shows that, depending on different propensity score methods, dyadic L-1 admissions into the US in a given year is on average 13 - 29 higher from partner countries given the maximum 60 months even when controlling for various confounders. The left panel shows that increases in L-1 validity lengths does not consistently show a statistically significant increase in the probability of L-1 admission existence as expected. First differences are calculated as the change in the expected value (probability or count) when the treatment is changed from zero to one while all other covariates are held constant at their mean (continuous covariates) or mode (discrete covariates).

Data and Methods

To address the concerns and question above, I exploit an unique change in L-1 visa validity length in 2006 for India which had L-1 validity lengths extended from 12 to 60 months.[22] India is substantively important and interesting to focus on for the following reasons. First, as illustrated in Section 3.3.1, India has become one of the largest sending country for ICT. Second, the rise of Indian L-1 admissions has become highly politicized because domestic workers fear the consequences of knowledge transfers that motivate MNCs in the first place (Hira 2010). That is, domestic workers may fear the increased *domestic* competition and lower wages that could happen when foreign skilled executives and workers rotate into the US to learn US workers' jobs. Additionally, they fear the increased *international* competition (e.g. outsourcing) that happens when these foreign skilled executives and workers take the

[22]There were no changes in Indian H-1B validity lengths in the same time period I focus on.

knowledge they have learned, returned home, and start their own companies (i.e. knowledge transfers through backward linkages).

I then employ the synthetic control method (Abadie and Gardeazabal 2003; Abadie, Diamond, and Hainmueller 2010; Abadie, Diamond, and Hainmueller 2014) to examine L-1 validity temporal effects in the case of India. The basic intuition of the synthetic control method is to use pretreatment period outcomes and their predictors to weight all unaffected control units according to their similarity to the treated unit and create a "synthetic" comparison unit that works as an appropriate counterfactual for the treated unit.[23] If the synthetic control unit tracks closely the treated unit in terms of the outcome of interest for all pretreatment periods but diverges in the post-treatment period, one can then plausibly attribute the change to the effect of the treatment.[24]

The strength of this method is that it relies on relatively weak assumptions. More specifically, it only relies on the assumption that control unit weights not changing across time for identification. This assumption is rather easy to defend if the synthetic control tracks the treated unit closely for a long pretreatment period: the longer the synthetic control tracks closely in terms of the outcome of interest, the less likely that the weights used to construct the synthetic control will change post-treatment. Furthermore, the method can be seen as a generalization of the difference-in-difference method where unobserved unit specific confounders are allowed to vary with time, which relaxes my assumption about no unobserved time-varying factors in the previous section.

India is thus a optimal choice for the applying the synthetic control method. Not only was its 2006 L-1 validity length extension from 12 to 60 months a meaningful variation in the treatment, but also the timing of its change allows a relatively long pretreatment period (6 years) to track on and a long post-treatment period to observe the effects compared to the few other countries that saw validity changes since 2000.[25]

I use the same panel data for the period 2000 to 2012 illustrated in Section 3.3.1 to conduct the synthetic control method. Because the synthetic India is meant to reproduce the L-1 visa admission levels that would have been observed for India in the absence of its visa validity extension, I discard from the pool of potential control countries (i.e. "donor pool" countries) those that have experienced a visa validity extension to 60 months, i.e. the treatment, during the sample period. This leaves 74 countries in the donor pool.[26]

[23] Given the fundamental problem of causal inference (Holland 1986), i.e. it's impossible to observe the value of both potential outcome (potential outcome if assigned to the treatment group and potential outcome if assigned to the control group) on the same unit, thus the motivation to create a "synthetic" control.

[24] For a more formal treatment of the synthetic control method, see (Abadie and Gardeazabal 2003; Abadie, Diamond, and Hainmueller 2010).

[25] Figure 3.2 shows other countries that have experience L-1 validity changes since 2000.

[26] Donor countries include: AFG, AGO, ALB, ARE, ARM, AZE, BDI, BEN, BGD, BHS, BIH, BLR, BRA,

Consistent with the analyses in the previous section, the outcome of interest is knowledge transfers measured as L-1 admissions while the treatment is the dichotomized measure of validity length. Using the technique described above and implemented by the **R** package `Synth` (Abadie, Diamond, and Hainmueller 2011), I construct a synthetic India that mimics the level of L-1 visa admission from India before its visa validity extension. To do this, I employ the same set of pretreatment covariates included in the previous analysis as predictors augmented by 6 years of lagged L-1 admissions (2000-2005) to improve tracking in the pre-intervention period.[27] I then estimate the effect of India's L-1 visa validity extension on its US L-1 admissions as the difference in L-1 admission levels between India and its synthetic version in the years after the visa validity extension was imposed. Finally, I perform a permutation test that applies the exact same synthetic control method illustrated above to estimate placebo effects for every control country in the donor pool. This test allows one to make inferences about how likely the effects estimated for India was due to random chance.

Results

The data and synthetic control method results indicate that Indian L-1 admission trends during the pretreatment period 2000-2005 is actually best reproduced by a synthetic control with Brazil assigned a weight of 1 and all other countries assigned zero weights. In other words, during the pretreatment period and among all donor countries, Brazil was most similar to India in terms of all predictors analyzed as shown in Table 3.2 with no other countries coming close. It also shows how an average of all countries in the donor pool does not provide an appropriate comparison group for India when studying the effects of L-1 validity extensions. This illuminates how the synthetic control method and its *weighted average* approach safeguards against extreme counterfactuals.[28]

The upper panel of Figure 3.7 plots the trends in L-1 visa admissions for both India and its synthetic counterpart (essentially Brazil) from 2000-2012. Notice that synthetic India tracks India's L-1 admission trends relatively closely in the pretreatment period but the divergence grows dramatically after the L-1 visa extension around 2006. In contrast, I apply the same

CAF, CHE, CHN, CIV, CMR, COD, COG, CUB, CYP, DJI, DZA, ETH, GAB, GIN, GNQ, HTI, IDN, IND, IRN, IRQ, JOR, KAZ, KGZ, KHM, LAO, LBR, LBY, LKA, LTU, LVA, MDG, MLI, MMR, MNG, MOZ, MRT, NAM, NER, NGA, OMN, PNG, QAT, RUS, SAU, SDN, SEN, SLE, SOM, SYR, TCD, TGO, TJK, TKM, TZA, UGA, UKR, UZB, VNM, YEM, ZAF, ZWE. I also exclude MEX since count changes inflated its L-1 admission statistics.

[27] FTA and colony were dropped since they did not vary across control countries in the donor pool.

[28] More technically, lagged L-1 admissions received the highest predictor weight, which is expected as admissions in the last year should predict admissions in the next year the best. Once these lagged admission predictors were included, Brazil receiving the weight of one always minimized the Root Mean Square Prediction Error (RMSPE) in the pretreatment period for the data available regardless what other predictors were included or excluded.

Predictors	India	Synthetic India	Average of 74 Control Countries
US Trade Dependence (log)	−1.97	−1.36	−5.96
US FDI Dependence (asinh)	0.04	0.02	0.04
BIT	0.00	0.00	0.20
Capital Openness	−1.17	−0.64	−0.34
Migrant Stock (asinh)	7.75	6.10	4.21
Regime Type	9.00	8.00	−0.30
Common Language	1.00	0.00	0.18
Distance (log)	2.46	2.04	2.21
Terrorist Attacks (asinh)	5.78	0.98	1.23
Cumulative Terrorist Attacks (asinh)	7.35	4.53	2.93
Tertiary Labor (log)	10.70	8.94	5.30
US Affiliate Employment (asinh)	1.88	2.30	1.08
Capital Open.*Tert. Labor (log)	−12.50	−5.57	−1.68
Real GDP per capita (log)	7.58	8.91	7.80
L-1 admissions 1999	6160.00	6358.00	240.74
L-1 admissions 2000	11945.00	8470.00	258.86
L-1 admissions 2001	15531.00	10079.00	281.49
L-1 admissions 2002	20413.00	9562.00	309.62
L-1 admissions 2003	21748.00	9465.00	279.64
L-1 admissions 2004	23134.00	9681.00	297.48

TABLE 3.2. Predictor Mean Comparison: Treated vs. Synthetic vs. All Donor Pool Countries.

synthetic control method to China, which never experienced changes in L-1 validity length. The lower panel of Figure 3.7 shows how China's synthetic counterpart tracks its trends closely throughout the whole time frame.[29] This "non-effect" given China's L-1 validity length was never extended demonstrates the feasibility using the synthetic control method in this case.

The upper panel of Figure 3.8 plots the gap trends in L-1 visa admissions between India and its synthetic counterpart from 2000-2012. Gap values farther from zero indicate larger differences in L-1 admissions between India and its synthetic counterpart. Again, it shows how the L-1 admission gap noticeably widens around 2006, the year of India's L-1 validity extensions. The results suggest that for the period 2006-2012, India's L-1 admissions increased by an average of 44773 per year compared to its synthetic control, or an average 57% increase compared to L-1 admission levels in 2005. In contrast, the lower panel shows that the gap in L-1 visa admissions between China and its synthetic counterpart fluctuates around zero, indicating no systematic differences throughout the time frame.

Figure 3.9 shows the permutation test results for applying the same synthetic control method to *all* 74 control countries in the donor pool. L-1 admission gaps between a county

[29]Synthetic China was constructed with a combination of Vietnam (0.87), India (0.125), and Myanmar (0.006).

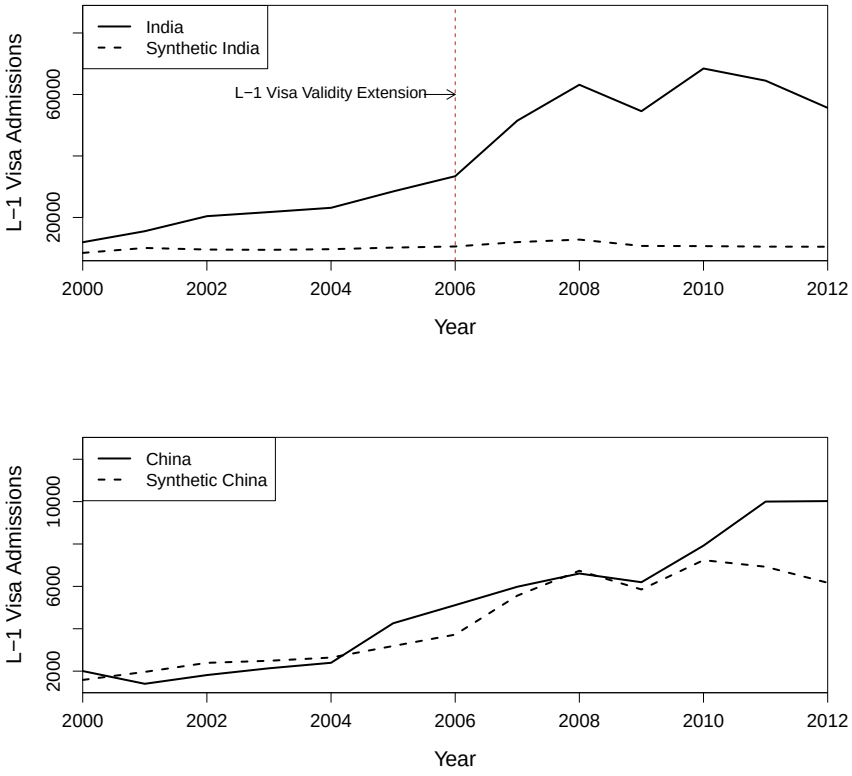

FIG 3.7. Trends in L-1 Visa Admissions: Treated vs. Synthetic. The upper panel plots the trends in L-1 visa admissions for both India and its synthetic counterpart from 2000-2012 and shows how divergence grows dramatically after the L-1 visa extension around 2006, suggesting a positive visa extension effect. In contrast, the lower panel shows how China's synthetic counterpart tracks its trends closely throughout the whole time frame, suggesting no systematic differences.

and its synthetic counterpart are plotted. Notice that gaps trends for all control countries fluctuate around zero throughout the time frame with the exception of India and the bottom downward trending gray line (Brazil). This clustering around zero for control countries is expected as none of the donor pool countries actually received validity extensions to 60 months. Brazil's downward trend, however, is not driving India's upward trend. When Mexico is added to the donor pool (currently excluded due to its count changes and inflated L-1 admissions), India's best synthetic control becomes Mexico assigned a weight of 1 while all other countries assigned zero weights. Under this scenario, India's positive trend and level remains the same. This suggests an even larger positive effect of visa extensions for India if Mexico's L-1 admissions were inflated.

Following Abadie and Gardeazabal (2003), Abadie, Diamond, and Hainmueller (2010), and Abadie, Diamond, and Hainmueller (2014), I also calculate the ratio of post-treatment

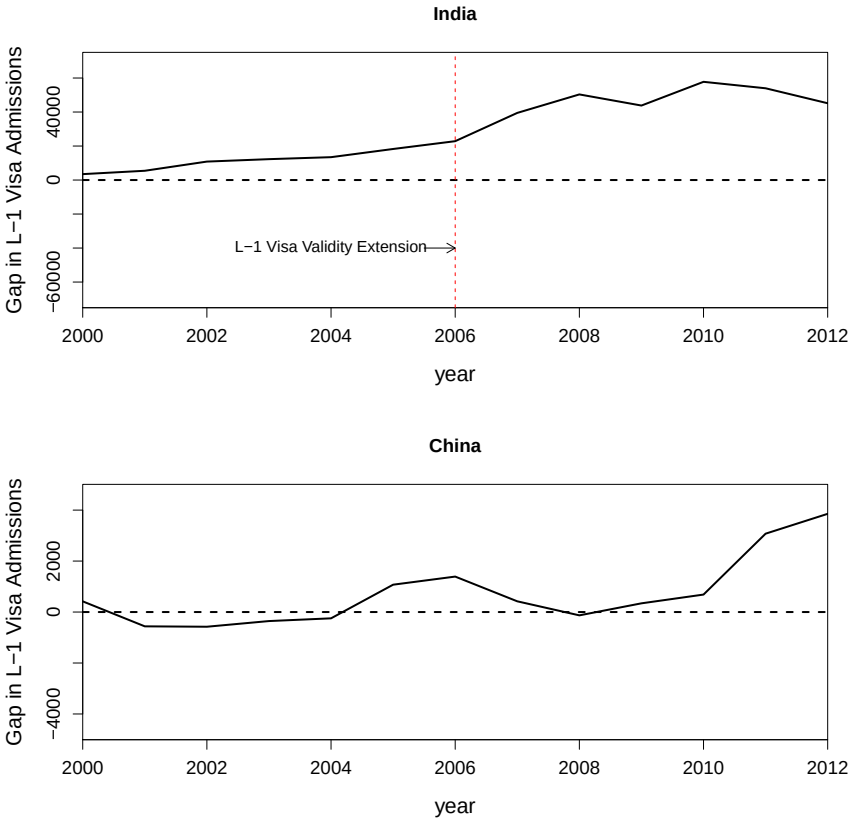

FIG 3.8. L-1 Visa Admissions Gaps: Treated - Synthetic. The upper panel plots the gap trends in L-1 visa admissions between India and its synthetic counterpart from 2000-2012 and shows how admission gaps noticeably begins to widen (on average a 44773 increase per year or 57% increase compared to 2005 levels) around 2006, the year of India's L-1 validity extensions. The lower panel shows that the gap in L-1 visa admissions between China and its synthetic counterpart fluctuates around zero, indicating no systematic differences throughout the time frame.

Root Mean Square Prediction Error (RMSPE) to pretreatment RMSPE for all countries to more formally make inferences about the levels of uncertainty of treatment effects found. Larger ratios indicate higher probabilities that there exists a difference in L-1 admissions between a country and its synthetic control before and after the treatment, which would support arguments of a treatment effect. Results here are less supportive as India's post-treatment RMSPE to pretreatment RMSPE ratio is 4.85, which is ranked 31st among the 74 countries. This result can be compared to p-value of 0.42, which can not reject the null hypothesis that the treatment effect is due to randomness. However, it is likely that that the relatively low RMSPE ratio may be due to limits on data availability. Since my pretreatment period only covers 6 years in contrast to 19 years in Abadie, Diamond, and Hainmueller (2010)'s example, the data I can draw on to create a synthetic control that

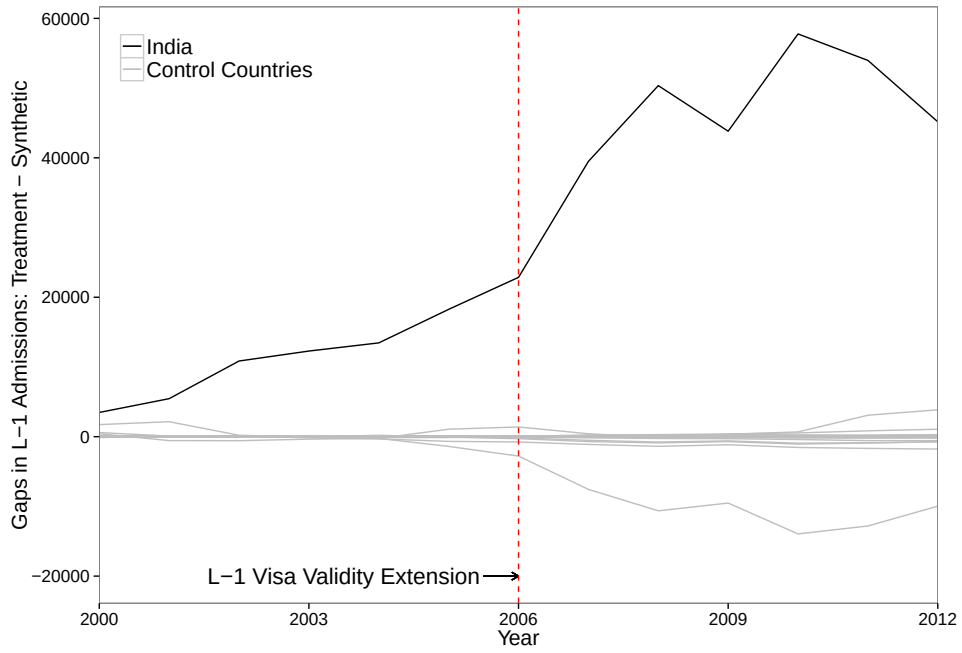

FIG 3.9. L-1 Admissions Gaps in India and Placebo Gaps in All 74 Control Countries. The figure shows the permutation test results for applying the same synthetic control method to *all* 74 control countries in the donor pool. Note how much gaps trends for India deviates positively from zero compared to other countries.

matches India better in the pretreatment period and make statistically significant inferences is limited. This leads to rather large RMSPEs in the pretreatment period and thus smaller RMSPE ratios. The results may also be due to India's unique dramatic growth of L-1 admissions, which limits the available selection of appropriate counter-factuals. Overall, even though the results show some supportive evidence, the problems above illustrate the difficulty of making strong token causal claims in India's case.

3.4 Concluding Remarks

Compared to the state or the firm, the role of the individual in influencing cross-border economic flows and outcomes has been until recently overlooked in extant political economy literature. By "bringing the individual back in," this chapter ties all three actors together and illuminates a specific mechanism through which the state can influence cross-border knowledge transfers and subsequent economic outcomes such as productivity and growth by manipulating migration cost-inducing visa policies, and changing the *mobility* of high skilled individuals who work for Multinational firms.

Building on this theory, I contrast migration policies that regulate *entrance* versus migra-

tion policies that regulate *mobility*. Specifically, given that the former is normally decided by the legislature while the latter is decided by the executive, factors as well as their ability to influence migration policies differ. Theses causes of policies that regulate mobility, as shown in my treatment assignment model, may include domestic labor market factors familiar to the migration literature, but may also include variables that capture geostrategic and security concerns discussed in the broader international relations literature. Furthermore, the higher flexibility of the executive in migration policy decision-making point to the potential of incorporating theories of organization or veto players into future studies on the political economy of migration. These political nuances about the assignment of migrant cost-inducing policies to partner countries have so far been overlooked by empirical studies on migration policy effects, which may lead to biased inferences.[30]

The dataset I construct to measure high skilled mobility visa restriction complements the recent wave of *immigration* policy dataset building in the following ways.[31] First, while most extant databases focus on immigration policies that regulate the easiness of initial entrance, my dataset focuses on visa policies that regulate the mobility, i.e. the repeated entry, of migrants. Second, immigration policies adopted by receiving countries can be either general (applying to all sending country) or dyadic (Beine, Bertoli, and Fernández-Huertas Moraga 2014). While most extant datasets focus on general immigration policy variation across receiving countries (Clark, Hatton, and Williamson 2007; Mayda 2010; Ortega and Peri 2013), my dataset shows more fine-grained visa policy variations across dyads *and* years.[32] Third, my visa policy coding method is transparent and can easily be extended to code mobility regulations for all other types of migrants entering the US or even other receiving countries.[33] This opens up the opportunity to improve our understanding of the causes and consequences of not just high skilled mobility, but also student, low skilled, or even tourist mobility.

The evidence I find shows that knowledge inflows, when measured as the count of ICT entries into the US in a given year, are on average higher from partner countries given longer

[30]For the growing literature on migration policy and migrant flows see for example Bertoli and Moraga Fernández-Huertas (2012) and Beine, Bertoli, and Fernández-Huertas Moraga (2014).

[31]See Table 2 of Helbling, Bjerre, Römer, and Zobel (2013) for a summary of 13 immigration policy indices and their coverage. See also the ongoing projects of the Immigration Policies in Comparison (IMPIC) Index, the International Migration Law and Policy Analysis (IMPALA) database, and Peters (2013) new dataset on low skilled immigration policy since late 18th century.

[32]To the best of my understanding, Neumayer (2006) and Neumayer (2010)'s dataset is the only other existing dyadic migration policy dataset. However, this dataset is cross-sectional as it only codes visa waiver for dyads in 2004.

[33]Wide variations on ICT visas restrictions exist among main ICT receiving countries besides the US such as the United Kingdom, Canada, Japan, and South Korea. For example, UK's Tier-2 (ICT) visa requires higher income and educational thresholds than the L-1 while allowing shorter stays. MNCs have thus threatened to close British plants and move to other countries (BBC 2010).

visa validity lengths even when accounting for various domestic and geopolitical factors. Additionally, there is some evidence that the increase in L-1 validity lengths for India in 2006 may have lead to the surge of ICT from India to the US. To the extent that my findings can be generalized to other receiving countries, these findings suggest how relaxed visa mobility regulations are functionally similar to patents and copyrights that support the production and transmission of ideas (Romer 2008). The findings also point to the feasibility and political incentives of using visa mobility regulations for statecraft in the current era of globalization. Taken together, the findings illustrate the need to broaden common political economy theories and empirical work that focus on the causes and consequences of *permanent* immigration policies, and consider how policies on *mobility*, and their underlying politics, can equally shape economic outcomes.

Finally, knowledge transfers are not directly observable. Even though I argue that ICT flows are more precise measures of knowledge transfers than trade or investment flows, my argument may still suffer from assuming that knowledge flows exist whenever ICT flows exist. A different way to show evidence about high skilled migration policy and its effects, is to test other observable implications of knowledge transfers that is directly measurable. For example, if MNCs that engage in higher levels of ICT due to more relaxed ICT visa restriction also show higher levels of firm productivity, then it is more likely that the theory proposed in the chapter is correct.[34] The findings of these additional observable implications may then be able to inform policy makers the value of structuring migration policy regimes as a mean to harness or direct knowledge outflows, which has further implications on the migration-development nexus.

[34]Of course the main challenge of such tests would be acquiring firm-level ICT data and matching such data with visa regulations and firm productivity data.

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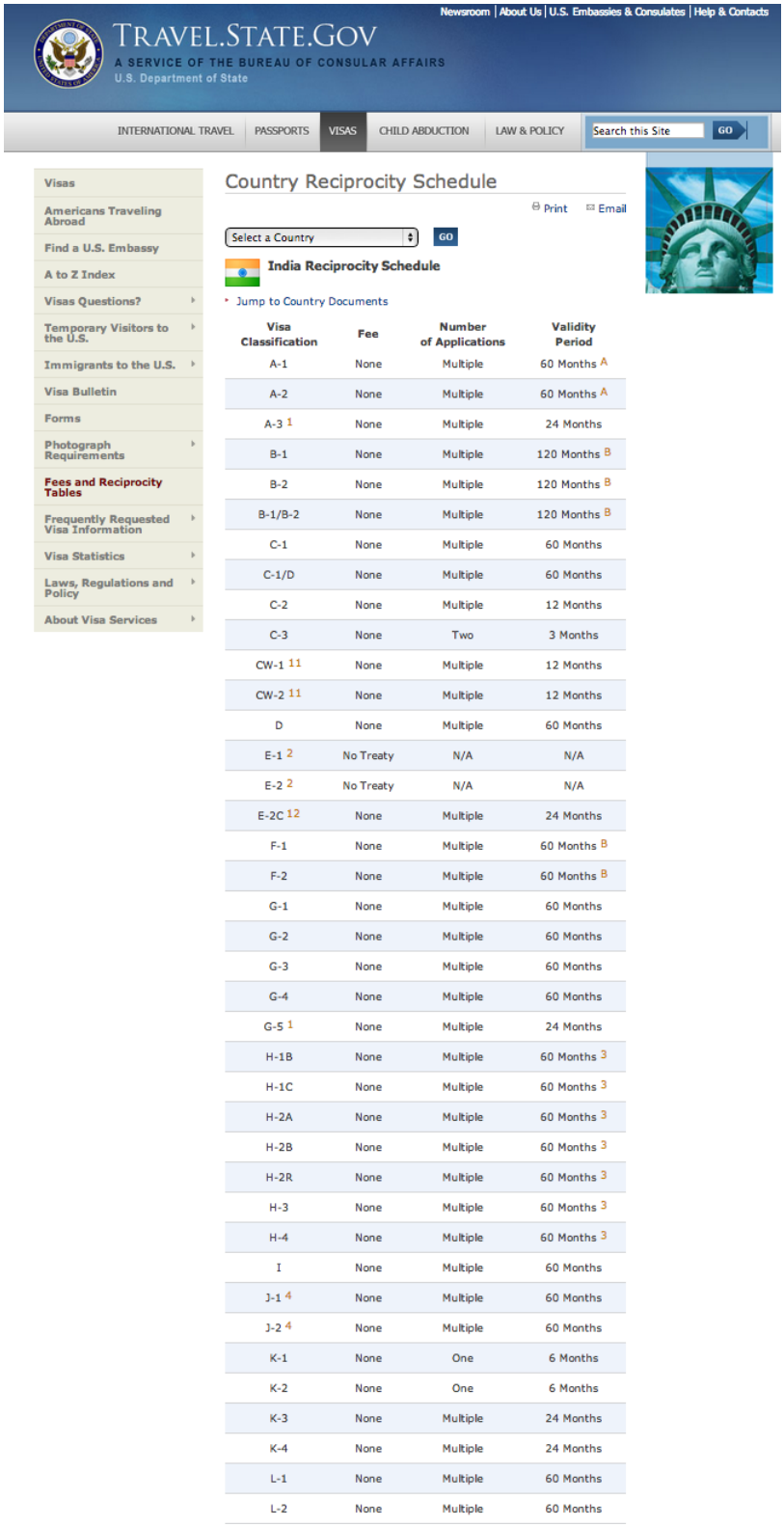
Appendix

Appendix 3.A Data, Variables, Operationalization



Visa Classification	Fee	Number of Applications	Validity Period
A-1	None	Multiple	60 Months A
A-2	None	Multiple	60 Months A
A-3 1	None	Multiple	24 Months
B-1	None	Multiple	120 Months B
B-2	None	Multiple	120 Months B
B-1/B-2	None	Multiple	120 Months B
C-1	None	Multiple	60 Months
C-1/D	None	Multiple	60 Months
C-2	None	Multiple	12 Months
C-3	None	Two	3 Months
CW-1 11	None	Multiple	12 Months
CW-2 11	None	Multiple	12 Months
D	None	Multiple	60 Months
E-1 2	No Treaty	N/A	N/A
E-2 2	No Treaty	N/A	N/A
E-2C 12	None	Multiple	24 Months
F-1	None	Multiple	60 Months B
F-2	None	Multiple	60 Months B
G-1	None	Multiple	60 Months
G-2	None	Multiple	60 Months
G-3	None	Multiple	60 Months
G-4	None	Multiple	60 Months
G-5 1	None	Multiple	24 Months
H-1B	None	Multiple	60 Months 3
H-1C	None	Multiple	60 Months 3
H-2A	None	Multiple	60 Months 3
H-2B	None	Multiple	60 Months 3
H-2R	None	Multiple	60 Months 3
H-3	None	Multiple	60 Months 3
H-4	None	Multiple	60 Months 3
I	None	Multiple	60 Months
J-1 4	None	Multiple	60 Months
J-2 4	None	Multiple	60 Months
K-1	None	One	6 Months
K-2	None	One	6 Months
K-3	None	Multiple	24 Months
K-4	None	Multiple	24 Months
L-1	None	Multiple	60 Months
L-2	None	Multiple	60 Months

Fig 3.A.1. Reciprocity Schedule Example

Variable	*Operationalization*	*Source*
L-1 Admissions	Total US L-1 visa admissions from partner country in a given year.	DHS
L-1 Validity	*Validity.* The maximum length of time for which L-1 visa holders are permitted to travel to a port-of-entry in the US (months). *Validity Dummy.* L-1 Validity = 60 months? 1 = yes, 0 = no.	DHS
US Trade Dependence	Bilateral trade of goods (exports + imports)/ US Real GDP (log).	UN Comtrade, PWT 8.0, Taiwan National Statistics
US FDI Dependence	Bilateral FDI abs(inflow + outflows)/ US Real GDP (asinh).	OECD, PWT 8.0
FTA	US FTA in force with Partner.	USTR
BIT	US BIT in force with Partner.	UNCTAD
Capital Openness	Chinn and Ito index.	Chinn and Ito (2011)
Migrant Stock	Stock of partner country-born population in the US (asinh).	OECD
Regime Type	Polity Score 2.	POLITY IV
Common Language	A language is spoken by at least 9% of the population in both countries? 1 = yes, 0 = no.	CEPII
Colonial Relationship	Dyad ever in colonial relationship? 1 = yes, 0 = no.	CEPII
Distance	Thousand kilometers between most populated cities (log).	CEPII
Terrorist Attacks	Annual terrorist attacks in partner country (asinh).	GTD
Cumulative Terrorist Attacks	Cumulative sum of terrorist attacks since 1998 in partner country (asinh).	GTD
Tertiary Labor	Total labor force with tertiary education in thousands (log).	WDI
US Affiliate Employment	Partner Country US affiliate total employment in thousands (asinh).	BEA
Real GDP per capita	Expenditure side per capita real GDP at constant 2005 PPPs (2005 US dollar).	PWT 8.0

Table 3.A.1. Variables, Operationalization, Sources

Variable	$\bar{x}$	**Min**	**Max**	**n**	**#NA**
L-1 Admissions	2043.15	0.00	144216.00	2548	30
L-1 Validity	39.65	1.00	60.00	2236	0
L-1 Validity (dummy)	0.51	0.00	1.00	2236	0
L-1 Validity (ordinal)	2.88	1.00	4.00	2236	0
US Trade Dependence	0.12	0.00	4.55	2510	68
US FDI Dependence	0.04	0.00	1.42	1317	1261
FTA	0.05	0.00	1.00	2578	0
BIT	0.20	0.00	1.00	2578	0
Capital Openness	0.35	-1.86	2.44	2458	120
Migrant Stock	286.31	0.00	11746.54	1745	833
Regime Type	3.30	-10.00	10.00	2381	197
Common Language	0.37	0.00	1.00	2578	0
Colonial Relationship	0.02	0.00	1.00	2578	0
Distance	8.81	0.55	16.18	2578	0
Terrorist Attacks	14.82	0.00	1306.00	2576	2
Cumulative Terrorist Attacks	100.65	0.00	7687.00	2576	2
Tertiary Labor	2924.37	2.43	45871.28	804	1774
US Affiliate Employment	53.75	0.00	1177.40	1581	997
Real GDP per Capita	11782.83	199.21	124720.44	2354	224

Table 3.A.2. Descriptive Statistics (untransformed)

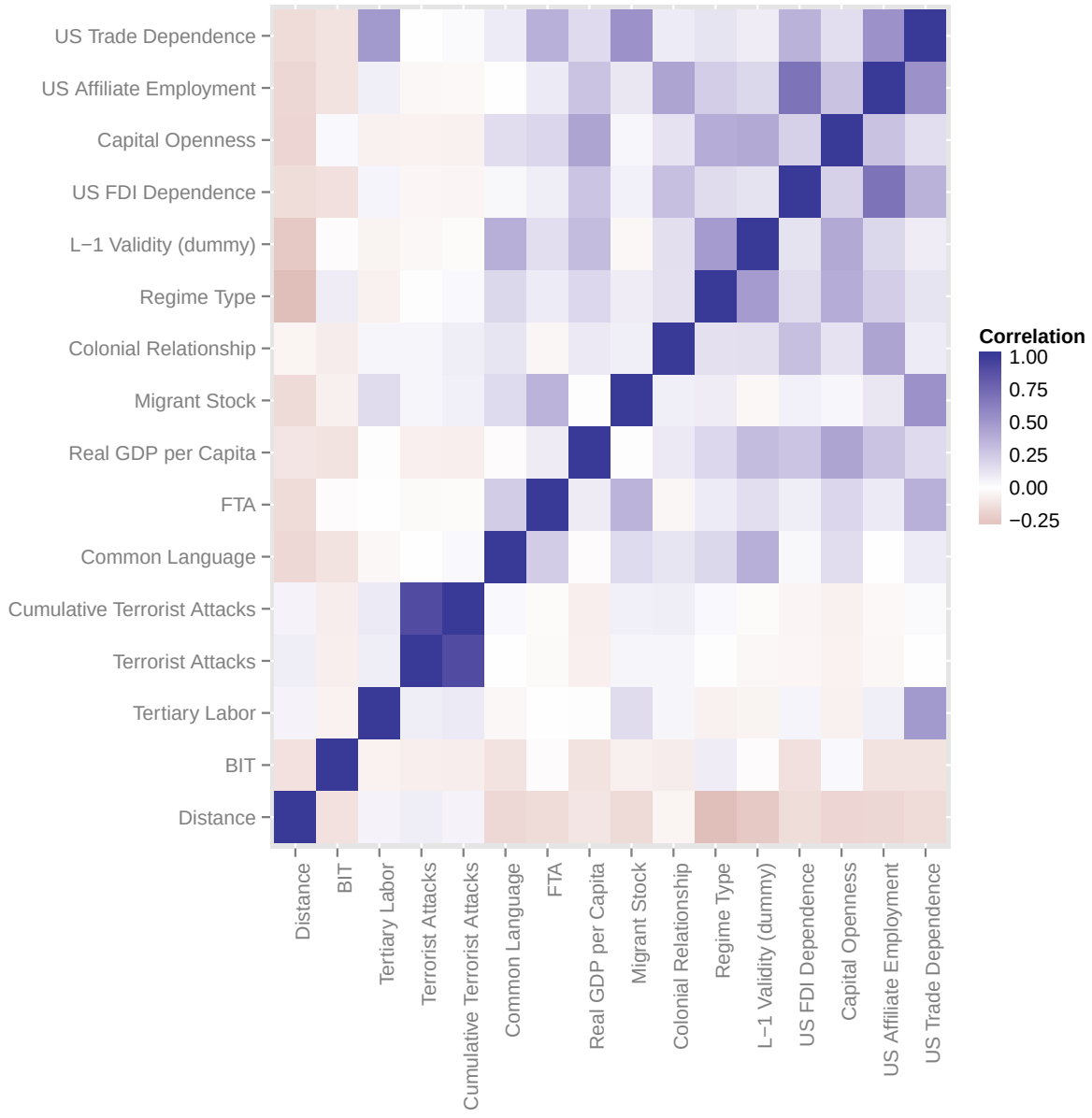


FIG 3.A.2. Covariate Correlation Matrix. Correlations between numeric variables are Pearson product-moment correlations, correlations between numeric and ordinal variables are polyserial correlations, and correlations between ordinal variables are polychoric correlations.

Appendix 3.B Parameter Estimates

	pre.0.mean	pre.0.std.mean	pre.1.mean	pre.1.std.mean	post.0.mean	post.0.std.mean	post.1.mean	post.1.std.mean
US Trade Dependence (log)	-5.80	-3.93	-2.20	-1.49	-4.87	-4.87	-1.84	-1.85
US FDI Dependence (asinh)	0.03	0.05	0.35	0.60	0.03	0.03	0.44	0.45
FTA	0.02	0.08	0.08	0.38	0.09	0.07	0.41	0.34
BIT	0.21	0.20	0.53	0.50	0.21	0.22	0.52	0.53
Capital Openness	-0.30	1.04	-0.18	0.63	0.01	0.24	0.00	0.14
Migrant Stock (asinh)	4.30	4.90	2.38	2.72	4.70	4.52	2.60	2.50
Regime Type	0.25	6.33	0.04	0.99	2.32	2.23	0.36	0.35
Common Language	0.19	0.55	0.38	1.13	0.35	0.38	0.73	0.78
Colonial Relationship	0.00	0.05	0.00	0.30	0.00	0.02	0.00	0.15
Distance (log)	2.21	1.95	4.42	3.90	2.05	2.10	4.10	4.21
Terrorist Attacks (asinh)	1.22	0.94	0.75	0.58	1.10	1.24	0.67	0.76
Cumulative Terrorist Attacks (asinh)	3.21	2.81	1.56	1.36	3.15	3.13	1.53	1.52
Tertiary Labor (log)	5.42	6.05	2.43	2.72	5.65	5.70	2.54	2.56
US Affiliate Employment (asinh)	1.04	1.95	0.55	1.04	1.59	1.54	0.84	0.82
Capital Open.*Tert. Labor (log)	-1.27	7.02	-0.13	0.70	0.92	2.05	0.09	0.21
Real GDP per capita (log)	7.91	9.22	5.81	6.77	8.47	8.60	6.22	6.32
factor(year)2001	0.08	0.07	0.30	0.27	0.08	0.07	0.30	0.25
factor(year)2002	0.08	0.08	0.29	0.28	0.07	0.07	0.28	0.24
factor(year)2003	0.08	0.08	0.29	0.28	0.07	0.08	0.27	0.30
factor(year)2004	0.08	0.08	0.29	0.28	0.08	0.09	0.28	0.34
factor(year)2005	0.08	0.08	0.29	0.29	0.07	0.09	0.28	0.34
factor(year)2006	0.08	0.08	0.29	0.29	0.07	0.09	0.28	0.33
factor(year)2007	0.08	0.08	0.28	0.29	0.08	0.08	0.29	0.29
factor(year)2008	0.08	0.08	0.28	0.29	0.08	0.07	0.30	0.28
factor(year)2009	0.07	0.08	0.28	0.30	0.08	0.08	0.28	0.28
factor(year)2010	0.07	0.08	0.28	0.30	0.07	0.08	0.27	0.29
factor(year)2011	0.07	0.08	0.28	0.30	0.08	0.08	0.30	0.29
factor(year)2012	0.07	0.08	0.28	0.30	0.08	0.07	0.30	0.28

TABLE 3.B.1. Control vs. Treatment Group Covariate Balance After CBPS. *Note*: "pre" and "post" indicate pre vs. post-treatment status. 0 and 1 indicate control and treatment group status. "std." idicates standardized means.

	$Prob(Y>0)$	$Prob(Y>0)$/Weight	$Prob(Y>0)$/Match	$E(Y)$	$E(Y)$/Weight	$E(Y)$/Match
Intercept	3.163$^{\wedge}$	2.735	0.997	0.740	1.442	1.165
	(1.685)	(1.720)	(2.262)	(0.721)	(1.077)	(0.742)
Validity (dummy)	0.525$^{\wedge}$	0.858***	0.475$^{\wedge}$	0.564***	0.557***	0.497***
	(0.289)	(0.192)	(0.287)	(0.106)	(0.067)	(0.066)
US Trade Dependence (log)	0.314***	0.294***	0.150	0.476***	0.489***	0.527***
	(0.065)	(0.058)	(0.102)	(0.035)	(0.048)	(0.035)
US FDI Dependence (asinh)	−0.500	−0.113	0.723	−0.142	−0.017	−0.139
	(3.269)	(4.659)	(3.475)	(0.406)	(0.313)	(0.336)
FTA	13.212	13.444	14.656	−0.347**	−0.164	−0.352***
	(810.816)	(622.955)	(1334.787)	(0.121)	(0.100)	(0.106)
BIT	0.950*	1.572***	2.320*	−0.052	−0.008	−0.075
	(0.378)	(0.368)	(0.984)	(0.082)	(0.103)	(0.071)
US Affiliate Employment (asinh)	−0.078	−0.065	−0.145	0.178***	0.172***	0.138***
	(0.111)	(0.129)	(0.126)	(0.026)	(0.032)	(0.021)
Capital Openness	−0.397$^{\wedge}$	−0.583*	−0.360	−0.146	−0.141	−0.074
	(0.226)	(0.216)	(0.242)	(0.135)	(0.147)	(0.055)
Tertiary Labor (log)	0.327***	0.396***	0.431***	0.235***	0.242**	0.234***
	(0.089)	(0.098)	(0.093)	(0.040)	(0.057)	(0.038)
Capital Open.*Tert. Labor (log)	0.069	0.114*	0.043	0.008	0.006	0.001
	(0.050)	(0.048)	(0.054)	(0.021)	(0.024)	(0.009)
Migrant Stock (asinh)	0.100	0.035	−0.030	0.106**	0.058*	0.049$^{\wedge}$
	(0.070)	(0.068)	(0.079)	(0.030)	(0.021)	(0.026)
Regime Type	−0.003	−0.004	−0.009	0.071***	0.075***	0.072***
	(0.018)	(0.013)	(0.023)	(0.008)	(0.006)	(0.006)
Colonial Relationship	10.752	9.759	12.223	−0.112	−0.177	−0.051
	(1401.464)	(1362.989)	(2315.962)	(0.169)	(0.154)	(0.159)
Common Language	0.678*	0.626**	1.142***	0.601***	0.560***	0.506***
	(0.268)	(0.188)	(0.308)	(0.082)	(0.057)	(0.088)
Distance (log)	−1.823***	−1.721***	−2.024***	0.069	−0.033	0.094
	(0.332)	(0.273)	(0.401)	(0.063)	(0.057)	(0.061)
Real GDP per capita (log)	0.344**	0.328***	0.510***	0.359***	0.321**	0.372***
	(0.111)	(0.093)	(0.148)	(0.052)	(0.077)	(0.049)
Terrorist Attacks (asinh)	−0.040	0.134	0.196	−0.077*	−0.000	−0.072*
	(0.113)	(0.097)	(0.224)	(0.034)	(0.033)	(0.029)
Cumulative Terrorist Attacks (asinh)	0.325***	0.348***	0.256**	0.163***	0.155***	0.179***
	(0.081)	(0.068)	(0.099)	(0.037)	(0.032)	(0.022)
Num obs.	2236	2236	1682	2236	2236	1682
Log Likelihood	−12762.041	−24447.234	−10619.484	−12762.041	−24447.234	−10619.484
AIC	25646.081	49016.468	21360.968	25646.081	49016.468	21360.968

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\wedge}p < 0.1$

TABLE 3.B.2. Fitted Hurdle Count Models with CBPS Weighting and Matching Methods. Column 1 and 4 show results for stright-up hurdle model results. Column 2 and 5 show hurdle model results combined with CBPS weighting. Column 3 and 6 show hurdle model results combined with CBPS matching.

Treatment	Prob. Estimates	2.5%	97.5%	Count Estimates	2.5%	97.5%
Validity (hurdle)	0.076	-0.002	0.227	29.197	8.169	148.834
Validity (weight & hurdle)	0.097	0.008	0.238	12.573	3.184	111.452
Validity (match & hurdle)	0.033	-0.004	0.201	18.677	4.745	74.445

TABLE 3.B.3. First Difference Estimates with Simulated 95% Confidence Intervals

Chapter 4

Panacea for International Labor Market Failures? Bilateral Labor Agreements and Labor Mobility

4.1 Introduction

To what extent do Bilateral Labor Agreements (BLAs) facilitate the cross-border mobility of labor workers they are designed to regulate? Cross-border labor mobility is one of the most debated political issues in all countries. In receiving developed countries, foreign low-skill workers compete against native low-skilled in the labor market (Scheve and Slaughter 2001; O'Rourke and Sinnott 2006) while also being perceived to bring adverse social and fiscal consequences (Hanson 2009).[1] Furthermore, the *mobility* of the low-skill has oftentimes "bridged" to permanent *immigration*. This exacerbates receiving country concerns, which is epitomized by the slogan "there is nothing more permanent than temporary foreign workers" (Martin 2001). The mobility of low-skill labor is no less controversial in sending countries. Incidents of foreign employers abusing and maltreating low-skill workers has lead to sending states being criticized for promoting low-skill labor mobility at the costs of worker rights and conditions (Blank 2011; Ruhs 2013).

Yet, cross-border labor mobility can offer various benefits. In receiving developed countries, the mobility of the low-skilled alleviates the excess demand of labor as their population age (Pritchett 2006). Furthermore, higher levels of low-skill labor mobility help receiving countries retain firms that would instead choose to move their production processes abroad in attempt to find cheaper labor as labor supply decreases (Peters 2014). This not only

[1] For a thorough review on public attitudes towards foreign workers, please see Hainmueller and Hopkins (2014).

benefits receiving country tax revenues but also helps politicians win elections. In sending developing countries, higher labor mobility relieves the excess supply of low-skill labor while mitigating the permanent loss of skilled workers. Furthermore, the remittances that the migrant workers send back home are found to be critical sources of foreign exchange, relatively resilient during financial crises and natural disasters, and exceeding Official Development Assistance (ODA), portfolio investment, or Foreign Direct Investment (FDI) in many developing countries (Agunias and Newland 2012; Sirkeci, Cohen, and Ratha 2012). Finally, work locations can be thought of as an asset that brings wage premiums. Higher labor mobility can thus become a development tool or financial management strategy for migrant workers and their families (Clemens, Montenegro, and Pritchett 2008; Clemens and Ogden 2013).

As a result, BLAs, flexible bilateral cooperation arrangements for managing labor migration, have been recently touted as an example of formal international cooperation that leads to "triple-win", in which migrants, the receiving country, and the sending country can all reap the economic benefits of higher cross-border labor mobility while mitigating the political costs (OECD 2009; Wickramasekara 2011; Skeldon 2012; Gibson and McKenzie 2014). The ensured return of the low-skill workers helps receiving state governments minimize perceived adverse consequences of permanent low-skill immigration and win political support for higher levels of low-skill labor mobility from their citizens. Worker rights, entailed in BLA-governed temporary worker programs, help sending governments mitigate domestic concerns about working conditions, human rights violations, and brain drain. Migrant workers accrue the benefits of location wage premiums while accumulating human capital. Given the promises of BLAs, Peters (2013) shows a resurgence of BLAs signed since the 1990s. The growing interest in BLAs, however, begs the question: do BLAs actually promote labor mobility between countries?

Few studies, however, offer systematic evidence linking international agreements and higher cross-border labor mobility. So far extant literature provides extensive theoretical and empirical accounts of a positive effect of international organizations and formal agreements on economic flows such as goods (Goldstein, Rivers, and Tomz 2007; Mansfield and Reinhardt 2008) and capital (Elkins, Guzman, and Simmons 2006; Büthe and Milner 2008; Büthe and Milner 2014). The key being how international institutions promote cross-border economic cooperation by solving market failures related to state-level communication, coordination, and commitment problems. In contrast, we still know relatively little about the relationship between international institutions and cross-border *people flows*.

In this chapter, I argue that BLAs *decrease* mobility for low-skilled workers they are designed to regulate, but *increase* mobility for high-skilled workers who are usually outside of their scope of regulation. This is because BLAs are different from traditional bilateral

agreements such as Preferential Trade Agreements (PTAs) and Bilateral Investment Treaties (BITs) in which BLAs solve state-level market failures by shifting the costs on to the mover in labor migration, i.e. migrant workers. This contrasts how PTAs and BITs simply lower barriers and transaction costs for the mover in trade (goods) and investment (capital). As a result, when migrant preferences are considered, I expect the mobility of migrant workers regulated by BLAs—commonly the low-skilled and more vulnerable—decrease due to BLA-induced migration costs. In contrast, the mobility of high-skilled workers increase because they are not only less vulnerable but oftentimes exempt from the induced costs. Furthermore, high-skilled workers can also benefit from BLA positive externalities such as better working conditions and rights.

To test this argument, I employ a unique skill-level Overseas Filipino Worker (OFW) dataset covering the period 1992 to 2009 and 173 receiving countries. I then fit Bayesian mixed effects models to estimate the average predicted effect of BLAs on labor mobility conditional on skill level. I also employ the synthetic control method (Abadie and Gardeazabal 2003; Abadie, Diamond, and Hainmueller 2010) to show the varying effects of BLAs conditional on skill-level in specific cases. The results show that BLAs are, on average, associated with lower mobility for low-skilled OFWs and higher mobility for high-skilled OFWs. Furthermore, the effects of BLAs are widely heterogeneous across receiving countries that have signed with the Philippines.

The chapter makes three main contributions. First, the chapter contributes to the literature on formal international cooperation. I layer migrant preferences on top of state and firm preferences emphasized in the literature on PTAs and BITs, and show how formal international agreements solve state-level market failures by producing different externalities on different migrant workers. This leads to gaps between international institutional design and effect. Second, the chapter raises implications for existing political economy explanations for migration policy formation. Specifically, the gap between BLA intentions and effects found in this chapter calls attention to verify fundamental assumptions commonly accepted in experimental settings about how migration policy outcomes affect the movement of people across borders, determine economic or social distributional consequences, and shape domestic attitudes and preferences. Third, the chapter contributes to the emerging empirical literature on migration policy effects.[2] The empirical finding of BLA heterogeneous treatment effect reconciles the emerging findings of negligible or mixed BLA effects (Engman 2010; Beine, Bourgeon, and Bricongne 2013; Peters 2013). This demonstrates the importance of testing theories on the most relevant population and incorporating as fine-grained data available to

[2]For example, see Bertoli and Moraga Fernández-Huertas (2012) and Beine, Bertoli, and Fernández-Huertas Moraga (2014).

untangle effects at different levels.

The chapter is organized as follows. Section 4.2 discusses why theories of international institutions would expect a positive relationship between BLAs and labor mobility. It then discusses and derives testable hypotheses about how the relationship may change when migration preferences and costs are considered. Section 4.3 presents the empirical analyses and results. Section 4.4 concludes.

4.2 Theory and Hypotheses

4.2.1 Theories of International Institutions and Cross-Border Flows

Since Keohane (1984)'s seminal work, the literature on international institutions in international relations has produced sophisticated theories and rigorous empirical evidence showing mostly positive effects of international organizations and agreements on cross-border goods (Goldstein, Rivers, and Tomz 2007; Mansfield and Reinhardt 2008) and capital flows (Elkins, Guzman, and Simmons 2006; Büthe and Milner 2008; Büthe and Milner 2014). If the relationship between BLAs and cross-border labor flows parallels the relationship between that of Preferential Trade Agreements (PTAs) and cross-border flow of goods, or Bilateral Investment Treaties (BITs) and cross-border capital flows, then theories of international institutions would expect BLAs to also facilitate cooperation between sending and receiving countries and promote labor mobility between the dyads by reducing market failures due to three main problems: communication, commitment, and coordination.[3]

First, communication problems in cross-border labor mobility can hinder cooperation between different actors. On one hand, miscommunications between migrant workers and employers commonly happen due to language difference, which produces uncertainties and transaction costs. This is especially salient in the case of low-skill worker mobility when workers may be relatively less educated and less likely to master a second language. BLAs can thus reduce such miscommunication problems and promote labor mobility by fostering transparency through means such as standardizing work contracts and legal liabilities. On the other hand, asymmetric or private information between sending and receiving states can produce problems of adverse selection (Akerlof 1970) when unqualified migrant workers crowd out those with good qualifications in international labor markets, or when receiving states with questionable human rights records crowd out those with good human rights records. BLAs can thus serve as a costly signaling device for actors to effectively communicate their "type" (e.g. better qualifications or working environments) to the other party thus resolving

[3]Or problems of uncertainty, transaction costs, and property rights (Coase 1960; Keohane 1984).

problems of information asymmetry (Spence 1973).

Parallel to the relationship between BITs and Foreign Direct Investment (FDI) flows (Neumayer and Spess 2005; Elkins, Guzman, and Simmons 2006), receiving countries that incur costs negotiating and signing BLAs reduce uncertainty and risks for low-skill workers by signaling better worker rights such as safer working environments and the legal right to remit all of their wages (Blank 2011). Given that the main motivation for temporary low-skill workers is to earn wages abroad and remit money to help family at home, signing BLAs are thus expected to increase low-skill labor mobility between dyad states in BLAs by signaling higher expected returns to workers. Along similar lines, sending countries that incur costs negotiating and signing BLAs may communicate their resolve to ensure the supply of qualified migrant workers, which reduces information asymmetry for receiving countries.

Second, commitment problems can also hinder cooperation between different actors. Under the rare situation of complete information, even if actors can effectively communicate their "type" and reach cooperation, actor preferences may change later on (i.e. time-inconsistent preferences Strotz 1955; Calvo 1978), which creates incentives to defect and breaks down cooperation. Institutions, domestic or international, are then proposed to solve these problems by serving as a commitment device that increases the costs of reneging for current or future governments.[4] These costs may include domestic audience costs (Tomz 2007) or international reputational costs (Abbott and Snidal 2000; Simmons 2000).

In the context of international labor mobility, the commitment problem is usually more severe for receiving countries than sending countries. This is because of the high international supply of low-skill labor and relatively low demand and unique nature of labor migration: people flows from relatively weaker states to stronger states (South-North migration). Together, this gives receiving countries higher bargaining power relative to sending countries, and lower costs of reneging (Peters 2013). Nevertheless, receiving countries reneging on BLAs may still induce audience costs from domestic firms and employers that rely on foreign low-skilled labor. It may also create reputational costs at the international level that make it more difficult for receiving countries to attract high quality migrant workers in the future. This is chargede in regions with high competition for labor. As a result, BLAs can mitigate above commitment problems and facilitate cooperation on cross-border labor mobility.

Third, even if actors can solve the communication or commitment problem illustrated above, they may still face coordination problems related to vacancy and screening costs. Vacancy costs are the opportunity costs of a position going unfilled. For example, the cost

[4]See for example, Greif, Milgrom, and Weingast (1994), Acemoglu and Robinson (2006), and Peters (2013).

of crops rotting in the field due to the lack of low-skilled labor (Peters 2013) or the costs of machinery under-utilized in production lines due to the lack of skilled labor. Building on the matching literature in labor economics, Peters (2013) argues that BLAs help mitigate vacancy costs by delegating to sending countries the responsibility of finding many workers in a short amount of time, which is similar to firms turning to "headhunters" to quickly fill in the positions they need.

Yet, employer-worker fit is also as important as the time needed to fill positions. Screening costs are thus the costs for matching ideal sellers to buyers (labor migrants and employers in this case) or *vice versa*. In a market with asymmetric information, this cost can be severe especially when the quality of interest is not directly observable. To solve this problem, Rothschild and Stiglitz (1976) show that uninformed sellers (in the context of insurance markets) can extract (risk) information about buyers (policyholders) by offering different contracts for a certain transaction, which leads to buyers revealing their own information through the contracts they choose, namely screening through self-selection.

In the context of international labor mobility, Peters (2013) argues that employers in receiving countries incur similar screening costs in the process of determining whether sending country migrant workers hold the correct level or type of skills needed. Furthermore, screening costs are particularly high in this context since educational and professional qualifications vary significantly across countries. As a result, BLAs solve coordination problems between states by assigning the responsibility and shifting the costs of screening to sending countries. For example, sending countries are usually responsible for creating temporary working programs in conjunction with the receiving country and recruiting suitable candidates. Furthermore, since sending countries are locked into a long term relationship with receiving countries, they have incentives to select not only suitable workers but also high quality workers with good work ethics. Due to the ability of BLAs to mitigate coordination problems and facilitate cooperation, they are thus expected to increase cross-border labor mobility.

Yet, despite the above theoretical reasons supporting a positive effect of international institutions on labor mobility, empirical support has been best mixed. For example, while Grogger and Hanson (2011) find that the Schengen Agreement, one of the few multilateral agreements on migration that exist, had little effect on the scale of labor migration among signatory countries using cross-sectional data, Beine, Bourgeon, and Bricongne (2013) find a significant positive effect using panel data. Turning to bilateral agreements, Engman (2010)—using case studies—shows that Philippine nurses working in the United Kingdom has declined over the years since the Philippines and United Kingdom signed their BLA. Meanwhile, Beine, Bourgeon, and Bricongne (2013), focusing on 30 OECD countries, finds

mixed effects of BLAs on bilateral labor mobility: significantly negative effects in some model specifications and significantly positive effects in others. Finally, Peters (2013) introduces the most systematic BLA dataset to date and provides some evidence supportive of a positive BLA effect on migrant inflows to certain OECD countries.

I argue that extant empirical findings are inconclusive for two main reasons. First, extant empirical attempts have mostly relied on migrant flow data collected based on *immigration* statistics that uses data from censuses, national population registers, and residence permits.[5] This implies that extant data sets may vary in their ability to capture the most relevant population of interest, i.e. the mobility of BLA-regulated labor migrants who work on short-term contracts for typically 2-3 years. For example, national authorities registering immigrants based on temporary work visas or residence permits are better at capturing the short-term mobile migrant workers. In contrast, national authorities registering immigrants according to citizenship or country of birth are better at capturing permanent immigrants (Beine, Bourgeon, and Bricongne 2013). As a result, the inclusion of national authorities using different immigration registration criteria in the same dataset not only introduces comparability problems across receiving countries, but also adds noise to the study of the temporary mobility of migrant workers.

Second, even if BLAs do influence the mobility of labor migrants, the effect of BLAs on labor mobility may be conditioned by various migrant individual characteristics such as skill level or wage, which is absent in country-level bilateral data sets. Different workers work in different receiving countries. It is possible that extant empirical accounts may have confounded the effects of receiving country characteristics with those of migrant worker characteristics. Furthermore, the studies may have overlooked the heterogeneous treatment effects of BLAs. For example, one would not expect to find BLA effects of the same size on low-skill workers who are directly regulated by BLAs versus high-skill workers who are generally governed by the General Agreement on Trade in Services (GATS). In the following, I illustrate in detail how migrant characteristics and their preferences generate heterogeneous BLA effects.

4.2.2 Why Migrant Preferences Matter? Migration Costs and Mobility

Although theories of international institutions may expect BLAs to solve market failures related to communication, commitment, and coordination problems between states and thus

[5]For example, Fitzgerald, Leblang, and Teets (2014)'s bilateral labor migration flow data employed in Peters (2013) or the bilateral migration flows dataset compiled by Beine, Bourgeon, and Bricongne (2013).

promoting higher cross-border labor mobility in general, I argue that BLAs are unique in which they help solve state-level market failures by shifting costs to migrant workers. Specifically, many of the BLA-induced costs (e.g. transportation, insurance, health, legal, administrative fees) are not only shifted to sending state governments, but also further passed on to sending country migrant workers or receiving country firms and employers. This implies that the effect of BLAs on mobility may be conditional on a migrant worker's ability to overcome BLA-induced costs.

On one hand, migrant workers are oftentimes charged medical exam and application fees under BLAs (Blank 2011). Given that many low-skill workers are already borrowing to finance their work abroad, such additional costs may reduce the pool and supply of low-skill labor who are able to go through the legal channels. Furthermore, these low-skilled workers are oftentimes too diverse and have too little market power compared to states or large firms to negotiate or collectively lobby against being passed on such costs.

On the other hand, firms and employers in receiving countries are required to submit processing fees, pay for certain worker insurance fees, and provide fair legal wages under BLAs. These additional costs may reduce the demand for foreign low-skill labor once the costs are taken into account. Mckenzie, Theoharides, and Yang (2014) illustrate how additional minimum wage requirements set by BLAs can lead to higher wages for workers able to secure jobs, but at the same time reduce the number of jobs available in receiving countries.

Taken together, BLAs may unintentionally lead to lower labor mobility for especially the low-skilled because they not only raise migration costs for migrant workers, but also reduce demand in receiving countries. BLAs are thus different from PTAs and BITs in which bilateral agreements actually introduce additional costs on the mover in labor migration (migrants) in contrast to lowering barriers and costs for the mover in trade (goods) and investment (capital). I summarize my argument as the following:

Hypothesis 4a: *Holding all else equal, BLAs increase migration costs for low-skill labor migrants and reduces their mobility.*

In contrast, high-skill labor is not only less vulnerable to BLA-induced migration costs but may even benefit from BLA-induced positive externalities. First, high-skilled labor is more scarce in the international labor market and thus more demanded in receiving countries. As a result, while most high-skilled migrant workers are exempt from paying recruitment fees, many low-skilled migrant workers are not under BLAs. Ratha, Eigen-Zucchi, Plaza, Wyss, and Yi (2013) notes how a Bangladeshi worker can spend between $1935 to $3870 to get a low-skilled job in the Middle East that pays $200 a month while high-skill workers are waived of their fees. Second, even if high-skilled worker are charged the additional costs

passed on by sending countries and recruiting agencies, they are more likely than low-skill workers to have enough savings or access to funds to do so. Third, Goswami and Sáez (2013:21) illustrates how the mobility of the high-skilled is already regulated under GATS Mode 4 in many countries. Therefore, past or new BLAs have little impact over these high-skilled workers. Fourth, the positive benefits introduced by BLAs for the low-skilled such as better human rights, working conditions, and minimum wage requirements are similar to public goods in which they are relatively non-rivalrous and difficult to exclude. As a result, BLAs may actually provide positive externalities for high-skilled workers who are already less vulnerable to BLA-induced costs by reducing aforementioned communication, commitment, and coordination problems in the international high-skilled labor market. Therefore, I summarize BLA implications on high-skill labor as the following:

Hypothesis 4b: *Holding all else equal, BLAs provide positive externalities to high-skill labor migrants who are also less vulnerable to BLA-induced migration costs, and increases their mobility.*

4.3 Empirical Analysis

In this section, I present the empirical results that establish the effects of BLAs on labor mobility. In contrast to theories of international institutions that expect BLAs to increase labor mobility in general, my theory predicts that BLAs reduce low-skilled labor mobility while increasing high-skilled labor mobility. Section 4.3.1 introduces the data used in the analysis. Section 4.3.2 examines the average predicted effect of BLAs on labor mobility using a Bayesian generalized linear mixed model and other robustness checks. Section 4.3.3 illustrates the effect of BLAs on labor mobility in receiving countries that have signed with the Philippines using the synthetic control method.

4.3.1 Data

As previously mentioned, empirical accounts on the effect of BLAs on labor mobility suffer from two main problems. First, migration flow data collected based on immigration statistics may not capture the most relevant population of interest: the mobility of temporary migrant workers regulated under BLAs. Second, not accounting for heterogeneity at the migrant worker individual level. Different workers work in different receiving countries (e.g. OFWs in the UK are mostly nurses while OFWs in Saudi Arabia are mostly production and construction workers), and a simple comparison of labor mobility for two different receiving countries can thus confound the effects of receiving country characteristics with those of

migrant worker characteristics. Furthermore, as illustrated in my theory, BLAs may have heterogeneous effects on labor mobility conditional on individual-level characteristics such as skill level.

To address these problems, I employ Mckenzie, Theoharides, and Yang (2014)'s unique skill-level OFW dyadic flow dataset covering the period 1992 to 2009, which is compiled based on Philippine Overseas Employment Administration's (POEA) micro data on departing OFWs.[6] This improves upon extant empirical work in two main ways. First, all OFWs must pass through POEA. The dataset thus includes *all* new OFW hires leaving the Philippines between 1992 and 2009 for temporary contract work. In contrast to noisy measures of different migrants captured in immigration statistics, these Filipino contract workers are most likely to be directly influenced by BLAs. Furthermore, the POEA oversees the largest labor worker program in the world, and thus the data offers wide variations in receiving countries and years. For example, 1.7 million Filipinos were working outside of the Philippines in 181 countries in 2007 (Mckenzie, Theoharides, and Yang 2014). Additionally, POEA has shown both the administrative capacity and experience to implement labor worker program effectively and the least incentives to shirk. Therefore, if BLAs do promote labor mobility by solving coordination problems and mitigating screening or vacancy costs as suggested in the literature, then supportive evidence should be most likely to be found in the case of OFWs.

Second, the dataset offers individual characteristic data such as average skill level and median wage for OFWs entering each receiving country and year.[7] This allows one to account for migrant worker heterogeneity extant studies have not been able to do.[8] Labor mobility comparisons are thus more likely to be appropriate once both skill- and receiving-level characteristics are accounted for. Additionally, it allows this chapter to test whether skill level *conditions* the effect of BLAs.

Outcome of Interest

The main outcome of interest in the chapter is the mobility of migrant workers, i.e. the mobility of OFWs. However, conceptualizing and operationalizing *mobility* is more difficult than it appears. Despite the existence of the temporary movement of people tracing back to premodern societies, extant political science or economics literature has exclusively focused the one-time cross-border *migration* of individuals, e.g. immigration for citizenship or permanent resident purposes. Yet, advances in transportation technology that lower the

[6] For further details on the dataset, please see Mckenzie, Theoharides, and Yang (2014:16-17)

[7] Although individual-level POEA data exists, such OFW data can not be circulated due to data purchase agreements according to personal correspondence with the authors.

[8] To the best of my understanding, no empirical work has systematically examined the effect of international agreements on labor migration at the *skill* level.

physical costs of cross-border movements have made multiple cross-border movements such as return migration, circular migration, and onward migration more common. Mobility has thus become an important way to describe and conceptualize such phenomena.

One way to think about mobility is that it captures the *ability* or *easiness* for individuals to move across borders. Ideally, this means having data on how frequently the same individual crosses borders in a fixed time period with higher frequency indicating higher mobility and *vice versa*. In practice, such data is oftentimes unfeasible or unethical for governments to collect or share. What is more commonly available now is aggregated bilateral inflow or outflow data in a given year. The *size* of dyadic flows can thus act as a proxy for the level of labor mobility between dyads. However, this type of data can also mask the fact that an individual may cross-borders many times or many individuals may be crossing the border one time in the same year. As a result, I operationalize mobility in the two following ways.

First, given the more fine-grained structure of my data, I operationalize `OFW Mobility` as a *ratio* to capture the relative easiness a certain skill level of workers can move to a given receiving country in a given year. In particular, OFW new hires for a given skill level, receiving country, and year as the percentage of total OFW new hires in the same skill level and year. For example, there were 3959 low-skilled new OFW hires in Taiwan in 2007. Total low-skilled new OFW hires in the world in 2007 was 157918. Therefore, low-skilled OFW mobility to Taiwan in 2007 was 3959/157918, which equals 2.51%.[9] OFW hire numbers rely on Mckenzie, Theoharides, and Yang (2014)'s data. Figure 4.1 illustrates the variation of OFW mobility across receiving countries in 2009. In general, OFW mobility was the highest in Saudi Arabia, United Arab Emirates, Taiwan, and Hong Kong in 2009.

Second, I also operationalize OFW mobility as the *count* of OFW new hires for a given skill level, receiving country, and year for robustness checks. Although the absolute magnitude of dyadic OFW flows may conflate multiple entries of a single individual with single entries of multiple individuals, it follows untransformed or logged measures of trade, migration, or capital flows used in conventional gravity models.[10] .

Key Covariates

The key covariate of interest in the chapter is `BLA`. BLA is a dichotomous variable operationalized as whether a receiving country and the Philippines has a signed BLA in a given year, with 1 indicating "yes" and 0 otherwise. All BLAs examined in the chapter are either Memorandum of Understanding (MOUs) or Memorandum of Agreement (MOAs), which are

[9]Similarly, there were 24650 high-skilled new OFW hires in Taiwan in 2007. Total high-skilled new OFW hires in the world in 2007 was 112139. Therefore, high-skilled OFW mobility to Taiwan in 2007 was 21.98%.

[10]See Anderson (2011) for a comprehensive review of gravity models used in economics.

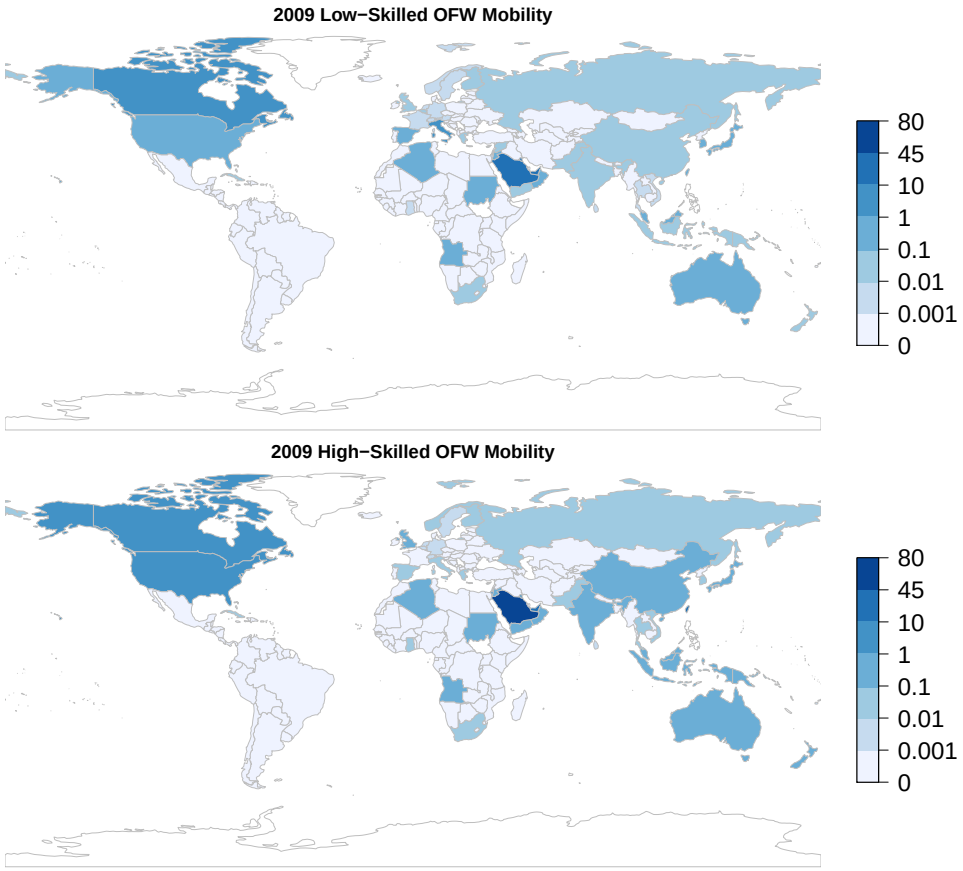


FIG 4.1. Cross-sectional variations in OFW mobility in 2009. Overall, Saudi Arabia, United Arab Emirates, and Hong Kong were the top 3 low-skilled OFW receiving countries (top panel). Saudi Arabia, Taiwan, and United Arab Emirates were the top 3 high-skilled OFW destination countries (bottom panel).

less legally binding than formal treaties. As of March 2014, the POEA's website show that the Philippines has 43 BLAs signed with 20 countries. Table 4.1 summarizes the countries that have signed BLAs with the Philippines and the year of their first BLA.[11] These BLAs specify cost assignment, the terms and conditions of employment, recruitment and grievance procedures and social security benefits, and other details for labor exchange and training (Engman 2010; Blank 2011). Finally, as with all variables on international institutions, the variable is "sluggish" in which there is relatively little temporal change.

Since my theory predicts that the effect of BLAs may be conditioned by worker skill level, I include in my models `Skill Level` and the interaction term `BLA*Skill`. Skill level is operationalized as a dichotomous variable with 1 indicating "high-skill" and 0 indicating "low-skill." Skill level data relies on Mckenzie, Theoharides, and Yang (2014). Since POEA micro data does not include skill levels, Mckenzie et al. calculate average education levels

[11] Please see http://www.poea.gov.ph/lmi_kiosk/labor_agreements.htm for further details.

Country	*Year of First BLA*
Bahrain	2007
Canada	2006
Indonesia	2003
Iraq	1982
Japan	2009
Jordan	1981
South Korea	2004
Kuwait	1997
Lao People's Democratic Republic	2005
Libya	1979
New Zealand	2008
Norway	2001
Papua New Guinea	1979
Qatar	1997
Spain	2006
Switzerland	2002
Taiwan	1999
United Arab Emirates	2007
United Kingdom	2002
United States	1968

TABLE 4.1. Philippine Bilateral Labor Agreements

by occupation using the 1992-2003 Survey of Overseas Filipinos (SOF).[12] In particular, they assign each occupation the average education level and then construct skill quartiles for each receiving country-year. I collapse their four-level measure into two: low vs. high.[13]

Figure 4.2 plots the relationship between BLA and OFW mobility unconditional and conditional on skill level.[14] The left panel shows that the existence of BLAs are in general associated with slightly higher OFW mobility unconditional on skill level. However, the difference is very small and statistically insignificant (p-value = 1). This is consistent with extant findings of negligible or slightly positive effects of international institutions on labor mobility. In contrast, when BLAs are conditioned on skill level, the panel on the right shows how OFW mobility is on average higher for the high-skilled while on average lower for the low-skilled when BLAs exist. This is consistent with the prediction of Hypothesis 4a and

[12]For example, large occupation groups include laborers, unskilled workers, service workers, shop and market sales workers, plant and machine operators and assemblers, professionals, and trade and related workers.

[13]Skill level 1 and 2 are combined into "low skill" while level 3 and 4 are combined into "high skill." The average years of schooling across all receiving countries and years for low- and high-skill OFWs are 12.2 and 14.45 years, respectively.

[14]I conduct the Inverse Hyperbolic Sine (IHS) transformation for OFW mobility to facilitate visualization. This is because mobility includes values of zero and thus $log(0)$ is undefined. The IHS transformation allows interpretations exactly the same as the natural log but allows values of zero (Burbidge, Magee, and Robb 1988).

Hypothesis 4b. I further examine the two hypotheses in more rigorous ways in the subsequent sections.

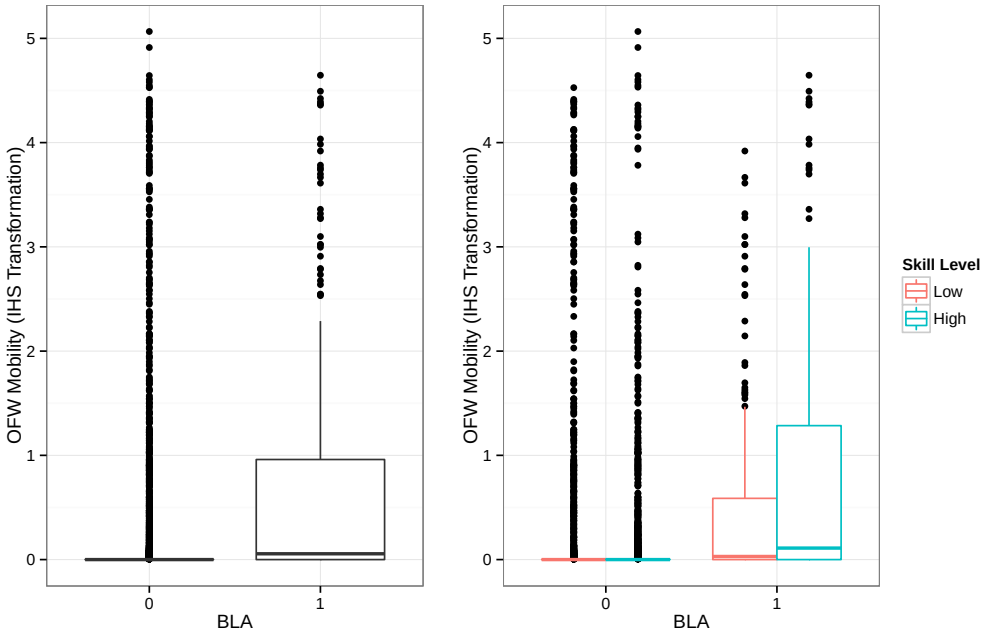


FIG 4.2. OFW Mobility Conditional on BLAs and Skill Level. The left panel shows that the existence of BLAs are in general associated with slightly higher OFW mobility unconditional on skill level. However, the difference is very small and statistically insignificant (p-value = 1). This is consistent with extant findings of negligible or slightly positive effects of international institutions on labor mobility. In contrast, when BLAs are conditioned on skill level, the panel on the right shows how OFW mobility is on average higher for the high-skilled while on average lower for the low-skilled when BLAs exist. This is consistent with the prediction of Hypothesis 4a and Hypothesis 4b.

Control Covariates

As is common in observational data, BLA existence is unlikely to be distributed randomly across dyads. For example, receiving country characteristics may influence both the probability of BLA existence and the outcome of interest labor mobility. More broadly, sources of BLA endogeneity may rise from time-varying or time-invariant characteristics at the individual level, receiving country level, or dyad level.[15] To address problems due to the endogeneity of BLA existence, I control for the following individual, receiving country, or dyad-level time-varying covariates to account for heterogeneity at each level. I also include

[15]Since the Philippines is the only sending country, receiving country and dyad-level characteristics are equivalent. Furthermore, time-invariant characteristics of the sending country does not vary at the level of unit of analysis. Time-varying characteristics of the sending country (e.g. labor supply) will be controlled with varying intercepts for year in the Bayesian generalized mixed models.

varying intercepts in the Bayesian generalized mixed models for both receiving countries and years to deal with endogeneity due to receiving country time-invariant characteristics and year-specific global shocks invariant to individuals and receiving countries.

Individual-Level Time-Varying Characteristics. Even within the same skill level, OFWs may earn very different wages in different years. For example, low-skilled OFWs going to Saudi Arabia in 2007 earned a median wage of $270 while low-skilled OFWs going to Japan in 2007 earned $1634. It is thus plausible that the differences in wages reflect unobserved characteristics of the migrant workers. These unobserved characteristics may include the specific occupation of the OFW, how well the OFW complements skills in the host country, language skills, or culture compatibility. As a result, these unobserved characteristics may influence where different OFWs select to go to and confound the effect of BLAs. Therefore, in addition to the particular skill level of OFWs, I control for the `Median Wage` of each skill level for a given receiving country and year to reduce heterogeneity at the individual level.

Receiving Country Time-Varying Characteristics. Receiving country characteristics such as labor supply and demand, international institution memberships, regime type, and macroeconomic factors may influence both the signing of BLAs and subsequent labor mobility. I illustrate each dimension in detail in the following.

Labor Demand and Supply. When labor demand is high and supply is scarce in the receiving country, vacancy costs can increase. Scarcity may then increase both the incentives and likelihood of receiving countries signing BLAs (Peters 2013) and the attractiveness of the receiving country to migrant workers. Following Peters, I capture labor scarcity in receiving countries in two ways. First, I construct a measure for `Regional BLAs` using POEA BLA data and UN regions data, i.e. the number of Philippine-involving BLAs existing in the receiving country's region at t - 5 years.[16] This measure captures the regional competition and demand for labor. The logic is that theories of international institutions expect more neighboring countries signing BLAs to divert migrant workers away from the receiving country, which increases the probability of receiving countries signing BLAs. As a result, the measure also serves as a proxy to capture the spatial spill-over effect of signing BLAs with the Philippines. Second, I include WDI (2013)'s measures of `Labor Force` size to capture the level of labor supply in the receiving country.[17]

International Institution Membership. Although BLAs are bilateral in nature, their existence, scope, and influence can be limited by the legal restrictions or commitments required

[16]For UN regions data, please see http://millenniumindicators.un.org/unsd/methods/m49/m49regin.htm.

[17]Alternatively, I employ WDI (2013)'s measure of `Unemployment Rate` and `Labor Participation Rate` in the receiving country to proxy for the level of labor demand and supply, respectively. Results are consistent and are available upon request.

when receiving countries become members of other international institutions such as Schengen or WTO. For example, Sáez (2013) illustrates how Spain's BLAs have been limited by EU laws and regulations such as the Schengen visa, border security regulations, EU readmission rules, and WTO agreements EU has negotiated. Furthermore, Schengen rules may have lead to higher labor mobility among members while reducing labor mobility for non-members. To capture this source of endogeneity, I employ a dichotomous variable `Schengen` to indicate whether the receiving country is a Schengen member in a given year with 1 indicating "yes" and 0 otherwise. Schengen membership data is from European Commission's website.[18]

In addition, legally binding trade agreements such as WTO's GATS have been better equipped and in practice preferred by states over BLAs to address high-skilled labor mobility. In contrast, BLAs have been preferred by states to address low-skilled mobility due to its greater flexibility (Stephenson and Hufbauer 2010; Sáez 2013). As a result, receiving country members of WTO and GATS that need high-skilled workers may have lower incentives to enter BLAs while nonmembers may be more likely to enter BLAs regardless of their skill level demand. To capture this source of endogeneity, I employ a dichotomous variable `WTO` to indicate whether the receiving country is a WTO member in a given year with 1 indicating "yes" and 0 otherwise. WTO membership data is from WTO's official website.[19]

Regime Type. Autocratic receiving countries may be more willing to sign BLAs to either signal their resolve for protecting human and worker rights or credibly committing to do so (Peters 2013). However, it is also likely that sending countries are less willing to engage in BLA negotiations with autocratic receiving countries given the low audience costs in autocracies and thus low credibility of such BLAs. Instead, BLAs signed by democratic receiving countries may provide a stronger signal and credible commitment to protect human rights. Furthermore, it may be easier and thus entail lower compliance costs for democracies to sign human rights-protecting BLAs due to their general support for liberal ideas (Owen 1994). To capture such sources of endogeneity, I measure `Regime Type` using the Unified Democracy Score (UDS), which leverages 13 different democracy indices using a Bayesian statistical measurement model (Pemstein, Meserve, and Melton 2010).[20]

Macroeconomics. Macroeconomic conditions in the receiving country affect the demand for foreign workers, the signing of BLAs, and also directly influence the returns for migrant workers. For example, Mckenzie, Theoharides, and Yang (2014) find a significant response

[18]Please see `http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/borders-and-visas/schengen/index_en.htm`. Alternatively, I employ a dichotomous variable `EU` to indicate whether the receiving country is a EU member in a given year. Data is from EU's official website `http://europa.eu/about-eu/countries/index_en.htm`. Results are consistent and are available upon request.

[19]For details, please see `http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm`.

[20]Alternatively, I employ the conventional Revised Combined Polity Score from Polity IV (2012). Results are consistent and are available upon request.

of migrant numbers to GDP shocks in the receiving country. To control for such sources of endogeneity, I employ measures of `Real GDP`, `Real GDP per Capita`, and `GDP growth`. Real GDP and GDP growth data rely on Mckenzie, Theoharides, and Yang (2014) and WDI (2013). Real GDP per capita data relies on Penn World Tables (PWT) 8.0 (2013).

Dyadic Time-Varying Characteristics. In addition to receiving country specific characteristics, dyadic time-varying characteristics such as economic interdependence and bilateral migration costs may influence both the signing of BLAs and subsequent labor mobility. I illustrate the two dimensions in detail in the following.

Economic Interdependence. The *de facto* bilateral economic dependence of the receiving country on the sending country may influence the existence of BLAs in many ways. First, flows of goods and workers can be thought of as substitutes when goods hold the labor inputs of workers. As a result, the higher the receiving country's trade dependence on the sending country, the less the receiving country needs to import foreign workers from the sending country for labor-intensive production processes, which lowers the incentives to engage in BLA negotiations. I measure *de facto* trade interdependence in two ways: (a) `Partner Trade Dependence` as bilateral trade of goods (exports and imports) divided by receiving country expenditure side real GDP, and (b) `PHL Trade Dependence` as bilateral trade of goods divided by the Philippines' expenditure side real GDP. Trade data relies on UN Comtrade (2013) and expenditure side real GDP relies on PWT 8.0. Second, the more the receiving country has relied on the sending country's migrant workers in the past, the more likely that the dyads may sign BLAs to secure improve such relationships. Therefore, I construct the measure `Cumulative OFW Count`, i.e. the cumulative count of new OFW hires in the same skill level in the receiving country since 1992, to control for this source of endogeneity.[21]

De jure economic dependence may also influence the existence of BLAs. On one hand, the signing of PTAs and BITs may facilitate the import of labor intensive goods from sending countries or the mobility of firms to the sending country, which reduces the need of migrant workers in the receiving country. This mechanism, similar to *de facto* economic dependence, may then reduce the likelihood of dyadic BLAs. On the other hand, countries that signed PTAs or BITs with PHL may be more likely to sign BLAs, either to utilize the flexibility of BLAs to complement legal binding trade and investment agreements (e.g. similar to the logic of signing bilateral currency swap agreements to complement trade and investment agreements illustrated in Liao and McDowell 2015), or due to the linkage of difference issue areas in negotiations (Davis 2004). To capture such source of endogeneity, I employ a dichotomous variable `PTA` on whether the receiving country has PTAs in force with the

[21] Cumulative OFW counts is IHS transformed.

Philippines in a given year with 1 indicating "yes" and 0 otherwise. PTA data relies on the Philippine Department of Trade and Industry (DTI).[22] Similarly, I employ a dichotomous variable `BIT` on whether the receiving country has BITs in force with the Philippines in a given year with 1 indicating "yes" and 0 otherwise. BIT data relies on UNCTAD (2013).

Migration Costs. The cost of moving for migrant workers between sending and receiving countries directly influences whether BLAs are worthwhile. If migration costs are too high, the signing of BLAs may only offer trivial returns for both sending and receiving countries. Meanwhile, migration costs also directly influence the mobility of migrant workers. Therefore, I control and measure migration costs using the size of sending country `Migrant Stock` in the receiving country. Larger migrant stock forms denser migrant networks. The information and support these migrant networks provide help reduce migration costs related to search, assimilation, and psychic costs. Therefore, larger migration stock is expected to reduce migration costs. For Filipino migrant stock data, I rely on mainly on the World Bank's Global Migration Database (2011) and augmented with POEA and Taiwan National Statistics data.[23]

Further details about variable are discussed in Appendix 4.A. In particular, Table 4.A.1 summarizes operationalization and data sources. Table 4.A.2 shows descriptive statistics for the variables. Figure 4.A.1 illustrates pair-wise correlations.

4.3.2 Average Predicted Effects

Bayesian Generalized Linear Mixed Model

I fit a Bayesian generalized linear mixed model given in equation (4.1) in order to identify receiving country-varying and time-varying effects of BLAs on OFW mobility.[24] $Mobility_{ijt}$ denotes the mobility of skill level i OFWs for receiving country j in year t. δ_j and λ_t denote varying intercepts for receiving countries and years, respectively. β_i denote varying slopes for the effect of BLAs and is a function of $skill_i$. $skill_i$ is also included to capture the direct effect of skill on mobility. $\boldsymbol{X}_{jt}$ include all other receiving country-varying and time-varying covariates discussed in Section 4.3.1.

[22] Please see http://www.dti.gov.ph/dti/index.php?p=87 for details.

[23] I take the IHS transformation for migrant stock.

[24] The Bayesian generalized linear mixed model was fitted using Stan (2014) with 4 chains, 6500 draws each (3250 warmup draws discarded), and thinned by taking every 2nd draw. Weak priors $\mathcal{N}(0, 1)$ were assigned to coefficient parameters. Uniform priors [0, 100] were assigned to σ parameters. $\hat{R}$ and traceplots suggest convergence. Further convergence diagnostic details are available upon request. To address issues with missing data, I create 3 multiply imputed data sets using the **R** package `Amelia II` (Honaker, King, and Blackwell 2011), fit the Bayesian generalized linear mixed model to each dataset, and combine draws for each parameter. The 3 multiply imputed data sets were created by implementing Amelia in parallel on University of Virginia's ITS Linux Cluster. See https://github.com/stevenliaotw/parallel for details.

$$
\begin{aligned}
&Mobility_{ijt} \overset{indep.}{\sim} \mathcal{N}(\delta_j + \lambda_t + \beta_i BLA_{jt} + \zeta skill_i + \psi median.wage_{ijt} + \gamma \boldsymbol{X}_{jt}, \sigma_{\mathrm{y}}^2) \\
&\delta_j \overset{i.i.d.}{\sim} \mathcal{N}(\delta, \sigma_\delta^2),\ \lambda_t \overset{i.i.d.}{\sim} \mathcal{N}(\lambda, \sigma_\lambda^2),\ \beta_i \overset{i.i.d.}{\sim} \mathcal{N}(\alpha_0 + \alpha_1 skill_i, \sigma_\beta^2), \\
&\zeta = (\zeta_1)^\top,\ \psi = (\psi_1)^\top,\ \gamma = (\gamma_1\ \gamma_2\ ...\ \gamma_{14})^\top, \\
&\boldsymbol{X}_{jt} = \Big(region.BLA_{jt}\ labor.tot_{jt}\ Schengen_{jt}\ WTO_{jt} \\
&regime_{jt}\ gdp_{jt}\ gdp.pc_{jt}\ gdp.growth_{jt}\ p.trade_{jt}\ phl.trade_{jt}\ cumulate.OFW_{jt} \\
&PTA_{jt}\ BIT_{jt}\ mig.stock_{jt} \Big)
\end{aligned}
\tag{4.1}
$$

Results

Figure 4.3 summarizes the coefficient posterior means and 95% central credible intervals for all predictors in the model.[25] Further details are summarized in Table 4.B.1 in Appendix 4.B. The results show that when skill level equals zero (i.e. the low-skilled), the coefficient of BLA is negative with a posterior mean of -0.46. Furthermore, it has a 0.95 probability of being between -0.93 and -0.01, and a 0.98 probability of being negative. In contrast, when skill level equals one (i.e. the high-skilled), the combined coefficient of BLA (coefficient for BLA and the interaction term) is positive with the posterior mean of 1.25. Furthermore, it has a 0.95 probability of being between 0.77 and 1.7, and essentially a 0 probability of being negative.

Figure 4.4 plots the distribution of first difference estimates for low- and high-skilled OFW mobility comparing BLA non-existence versus existence.[26] Table 4.B.2 in Appendix 4.B summarizes further details. The figure illuminates how low-skilled OFW mobility is on average 0.46% *lower* when BLAs exist. In contrast, high-skilled OFW mobility is on average 1.26% *higher* when BLAs exist. Given that the average OFW mobility is only 0.58%, these predicted effects correspond to a 79.38% decrease for low-skilled mobility and a 217.86% increase for high-skilled, which are large substantive effects.

[25] One of the benefits of a Bayesian implementation of the generalized linear mixed model is that it yields a full distribution for parameters in the model in contrast to a single "point estimate" under a frequentist approach. The "posterior mean" is thus the mean value of the distribution while other quantities of interest such as quantiles are also easy to extract. Additionally, it allows one to flexibly interpret the credible intervals in probabilities or the probability of coefficients being positive or negative, which contrasts the arbitrary p-level significance cut point under a frequentist approach.

[26] First differences are calculated as the change in the expected value of OFW mobility when the treatment is changed from zero to one while all other covariates are held constant at their mean (continuous covariates), median (ordinal), or mode (discrete covariates).

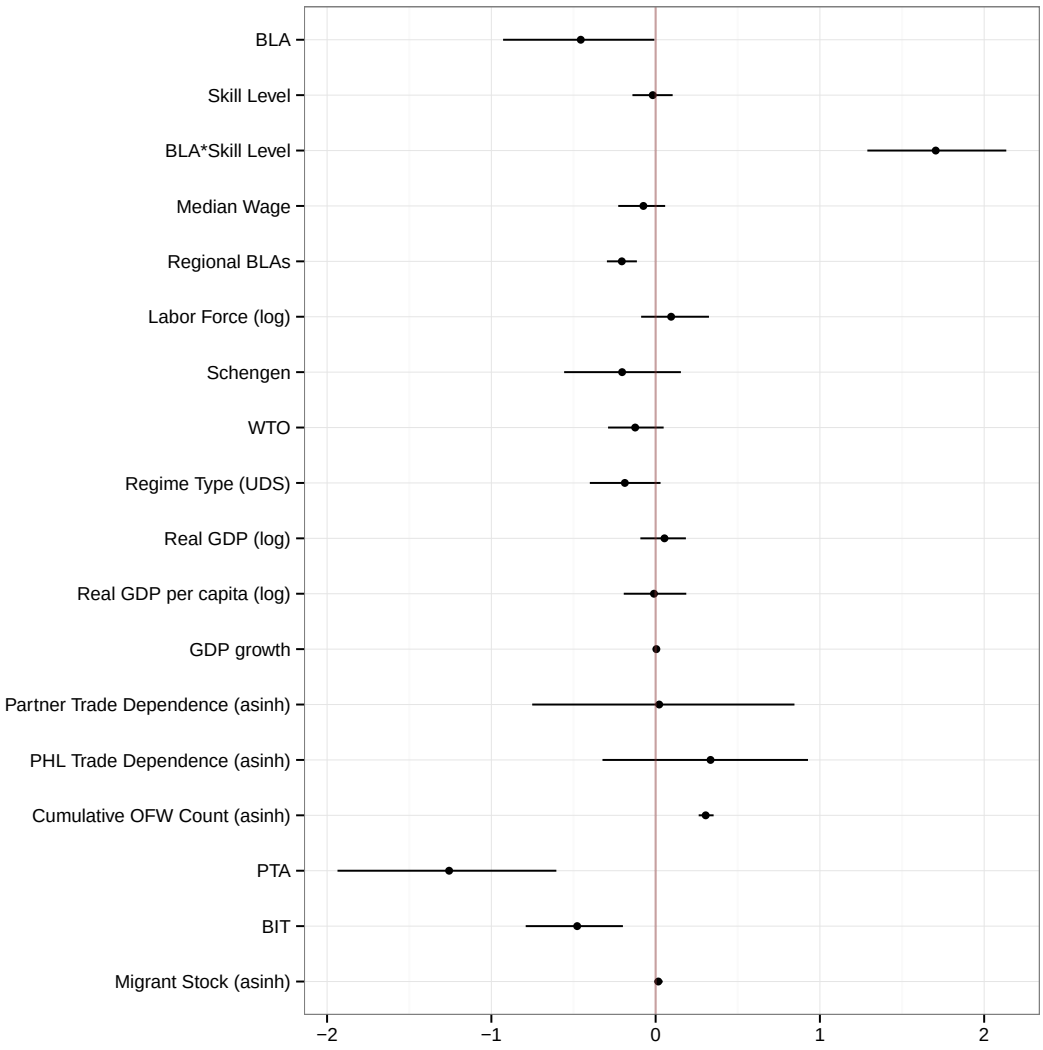


FIG 4.3. Bayesian Generalized Linear Mixed Model Coefficient Posterior Means and 95% Central Credible Intervals. Intercepts for year and receiving country excluded to facilitate presentation. The results show that when skill level is low, the coefficient of BLAs is negative with a posterior mean of around -0.46. In contrast, when skill level is high, the combined coefficient of BLA (coefficient for BLA and the interaction term) is positive with the posterior mean of 1.25.

Robustness Checks

To examine the robustness of the findings, I conduct two sets of robustness checks. First, I fit Ordinary Least Squares (OLS) models with fixed effects, which relaxes some of the strong assumptions made in the previous mixed model. For example, assumption about the parametric distribution for varying intercepts or assuming no correlations between the covariate of interest BLAs and country or year unit effects (Clark and Linzer 2012). As shown in the first two columns in Figure 4.5, substantive results are consistent regardless of

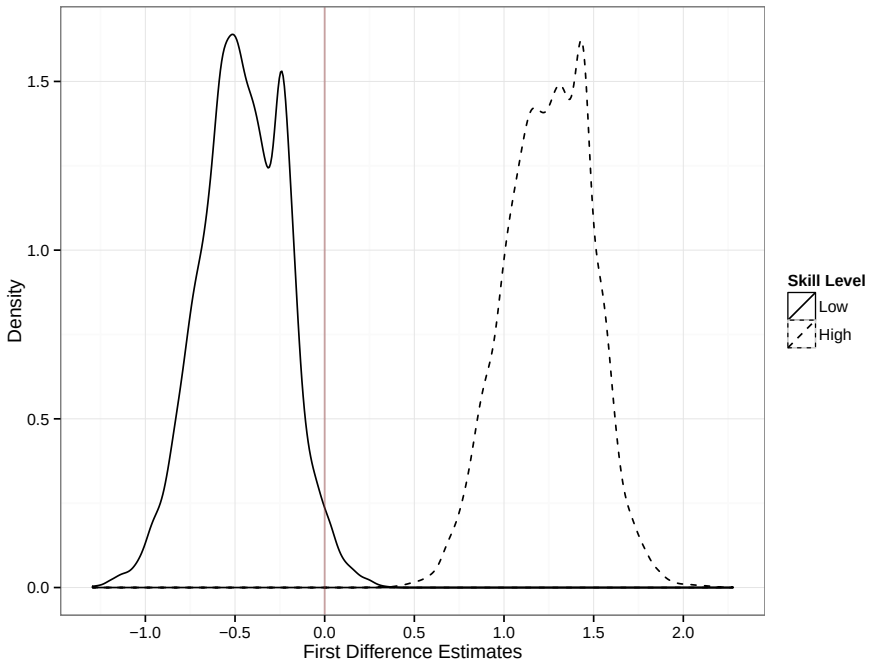


FIG 4.4. BLA First Difference Estimates for Low-skill versus High-skill OFWs. This figure illuminates how low-skilled OFW mobility is on average 0.46% *lower* when BLAs exist. In contrast, high-skilled OFW mobility is on average 1.26% *higher* when BLAs exist. Given that the average OFW mobility is only 0.58%, these predicted effects are substantively large.

including just receiving country fixed effects or including both receiving country fixed effects and year fixed effects.

Second, I fit count models to the same data but replace the outcome of interest using the *count* of OFW new hires. However, the OFW count data exhibits two characteristics commonly seen in count data. First, the clustering of OFW new hires across certain years or receiving countries. Second, 70.12% of all observations have counts of zero. Since overdispersion and excess zeros can both bias Poisson model estimates, I first fit Poisson Quasi-Maximum Likelihood (PQML) models (or Poisson Pseudo-Maximum-Likelihood, PPML) that address problems with overdispersion or heteroskedastic errors caused by excess zeros (Santos Silva and Tenreyro 2006; Wooldridge 2010; Santos Silva and Tenreyro 2011).[27] As shown in the column 3 and 4 of Figure 4.5, substantive results are mostly consistent when including just receiving country fixed effects or including both receiving country fixed effects and year fixed effects. The only exception is that the coefficient for BLA when skill level is low becomes slightly statistically insignificant (p-value = 0.06). Further details are summarized in Table 4.B.3 in Appendix 4.B.

[27]Technically, keeping the Poisson mean regression function and variance function but leaving the dispersion parameter unrestricted and estimated from the data (Zeileis, Kleiber, and Jackman 2008).

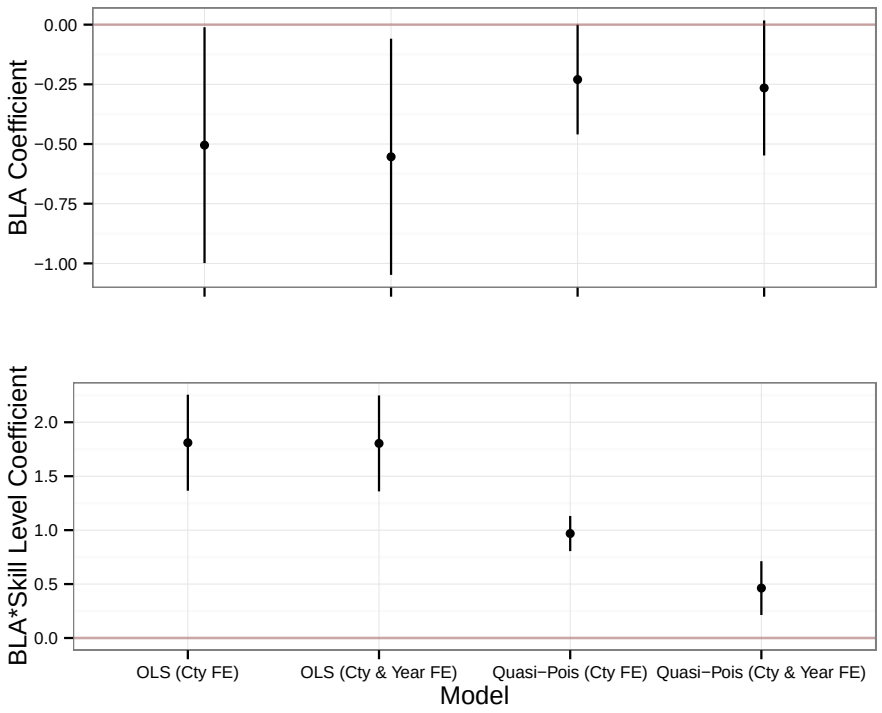


FIG 4.5. Robustness Model Estimates. This figure plots the coefficients using OLS and Quasi-Poisson estimators. Substantive results are mostly consistent with the main findings.

4.3.3 Country Specific Effects

Although the research design in this chapter improves on extant attempts by exploiting skill-level variations, causal identification of the effect of BLAs on OFW mobility is still challenging as the regression results rely on the two following assumptions. First, there are no unobserved *time-varying* skill-level, receiving country, or dyadic characteristics that influence both BLA existence and the outcome skill-level OFW mobility. Second, the usual stable unit treatment value assumption (SUTVA), which implies here that potential mobility to a receiving country does not change with the BLA treatment assignment of any other receiving country and that all units receive same versions of the BLA treatment (Rubin 1978).[28] Furthermore, a more important question to policy makers considering the use of BLAs may be more narrowly the effect of BLAs on the "treated" (i.e. the effect of BLAs for countries that actually signed with the Philippines had they not signed) instead of the average effect over both the "untreated" (i.e. the effect BLAs for countries that have not signed with the Philippines had they signed) and "treated" examined in the previous regressions. As a

[28] I try to address spill-over effect with the control variable `Regional BLAs` but will still need to address variations between different BLAs in future research.

result, I employ in this section the synthetic control method to address concerns about time-varying unobserved covariates and examine BLA effects on labor mobility in the receiving countries listed in Table 4.1.

Synthetic Control Method

The basic intuition of the synthetic control method is to use pretreatment period outcomes and their predictors to weight all unaffected control units according to their similarity to the treated unit and create a "synthetic" comparison unit that works as an appropriate counterfactual for the treated unit.[29] If the synthetic control unit tracks closely the treated unit in terms of the outcome of interest for all pretreatment periods but diverges in the post-treatment period, one can then plausibly attribute the change to the effect of the treatment.[30]

The strength of this method is that it relies on weak assumptions. More specifically, the identification strategy only assumes that weights for control units remain constant over time. This assumption is thus justifiable if the synthetic control unit tracks the treated unit closely for a long pretreatment period: the longer the synthetic control tracks closely in terms of the outcome of interest, the less likely that the weights used to construct the synthetic control will change post-treatment. Furthermore, the method can be seen as a generalization of the difference-in-difference method where unobserved unit specific confounders are allowed to vary with time, which relaxes the assumption about no unobserved time-varying factors in the previous section.

I use the same data described in Section 4.3.1 and implement the synthetic control method on each of the receiving countries listed in Table 4.1 and skill level. Because the synthetic control is meant to reproduce skill-level OFW mobility levels that would have been observed for each of the treated receiving countries in the absence of its BLA with the Philippines, I discard from the pool of potential control countries (i.e. "donor pool" countries) all countries listed in Table 4.1. This leaves 153 countries in the donor pool.[31]

Consistent with the analyses in the previous section, the outcome of interest is the ratio measure of OFW mobility while the treatment is the existence of BLAs. Using the technique described above and implemented by the **R** package `Synth` (Abadie, Diamond, and Hainmueller 2011), I construct a synthetic control unit for each treated receiving country that mimics the level of high or low-skilled OFW mobility before BLAs were signed. To do

[29] Given the fundamental problem of causal inference (Holland 1986), i.e. it's impossible to observe the value of both potential outcomes (potential outcome if assigned to the treatment group and potential outcome if assigned to the control group) on the same unit, thus the motivation to create a "synthetic" control.

[30] For a more formal treatment of the synthetic control method, see (Abadie and Gardeazabal 2003; Abadie, Diamond, and Hainmueller 2010; Abadie, Diamond, and Hainmueller 2014).

[31] In particular, all countries included in the data (173) minus all countries in Table 4.1 (20).

this, I employ the same set of covariates included in Section 4.3.1 as predictors augmented by lagged mean high or low-skill OFW mobility to improve tracking in the pre-intervention period. For example, Taiwan first signed its BLA in 1999 so I augment the set of covariates with 7 years (1992-1998) of lagged mean high or low-skill OFW mobility. I then estimate the effect of BLAs on OFW mobility as the difference in mobility levels between the treated receiving country and its synthetic version in the years after BLAs were signed.

Results

Figure 4.6 illustrates two main cases that are consistent with my argument: Bahrain and Spain. In the upper panel, the figure shows how levels of OFW mobility for synthetic Bahrain (dashed line) tracks actual Bahrain OFW mobility (solid line) relatively well in the pretreatment period.[32] However, after Bahrain signed their BLA with the Philippines in 2007 (red dotted vertical line), low-skill OFW mobility decreased relatively to the synthetic control (upper left plot) while high-skill OFW mobility increased (upper right plot). Low-skill OFW mobility was on average 0.33 and cumulatively 0.98 lower across the post-treatment years. Given that the mean low-skill OFW mobility was 1.38 across the whole period, these correspond to 23.52% average and 70.55% cumulative decreases. In contrast, high-skill OFW mobility was on average 0.73 and cumulatively 2.19 higher across the post-treatment years, which correspond to 68.94% average and 206.82% cumulative increases compared to the mean high-skill OFW mobility 1.06 across the whole period. The same pattern is shown in the case of Spain after signing their BLA with the Philippines in 2006: low-skill OFW mobility decreased while high-skill OFW mobility increased.[33]

Figure 4.7 illustrates cases that either show partial support (row 1 to 4) or contradict to my predictions (rows 5). The first row shows how low-skill OFW mobility decreases immediately and persistently after Taiwan signed their BLA with the Philippines in 1999, which is consistent with my predictions. However, the BLA effect on high-skill OFW mobility is unclear given poor tracking in the pretreatment period. In contrast, the second row shows how high-skill OFW mobility increased after South Korea signed their BLA with the Philippines in 2004, which is consistent with my predictions. Yet, there appears to be no BLA effects on the low-skilled. In row three, both low and high-skill OFW mobility increased in

[32]The data and synthetic control method results indicate that low-skill OFW mobility trends in Bahrain during the pretreatment period are actually best reproduced by a synthetic control consisted of 42.96% Oman, 24.58% Greece, 16.05% Cypress, 12.88% Russia, and 3.53% Saudi Arabia. High-skill OFW mobility trends are best reproduced by a synthetic control with 74.81% Russia, 16.05% Oman, 7.33% Israel, 1.66% Saudi Arabia, and 0.15% Australia.

[33]Low-skill OFW mobility trends in Spain are best reproduced by a synthetic control with 50.74% Cypress, 33.66% Italy, and 15.16% Cuba. High-skill OFW mobility trends are best reproduced by a synthetic control with 40.67% Greece, 28.38% France, 13.58% Italy, 11.64% Macedonia, and 4.01% Luxembourg.

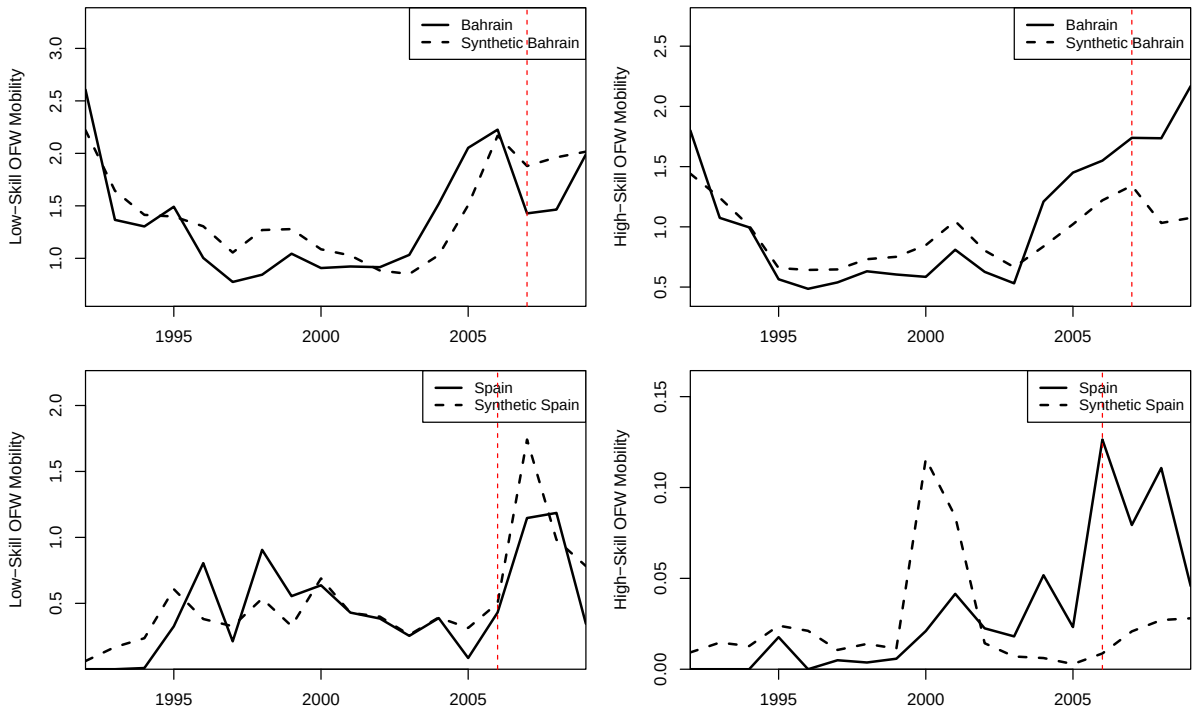


FIG 4.6. Synthetic Control Path Plots: Supportive Cases. This figure shows how low-skill OFW mobility decreased relatively to the synthetic control while high-skill OFW mobility increased after Bahrain and Spain signed BLA with the Philippines, which is consistent with my predictions.

Canada after signing in 2006. Whereas in row four, both low and high-skill OFW mobility decreased after Switzerland signed in 2002. UK's case in the last row demonstrates the interesting situation where signing a BLA in 2002 actually increased low-skill OFW mobility while decreasing high-skill OFW mobility, which is directly opposite of my predictions.[34]

Overall, these findings demonstrate the wide range of heterogeneous BLA effects across skill level in different receiving countries, which highlights the importance distinguishing how different migrant workers are affected under international agreements. Furthermore, it identifies the specific cases in which my predictions are fully supported, partially supported, or contradicted.

4.4 Concluding Remarks

The premise that international institutions promote cross-border economic integration by mitigating problems with market failures is central to theories of international relations. While support has been found in issue areas such as trade and capital flows, systematic

[34]Synthetic control results for the remaining treated countries are available upon request.

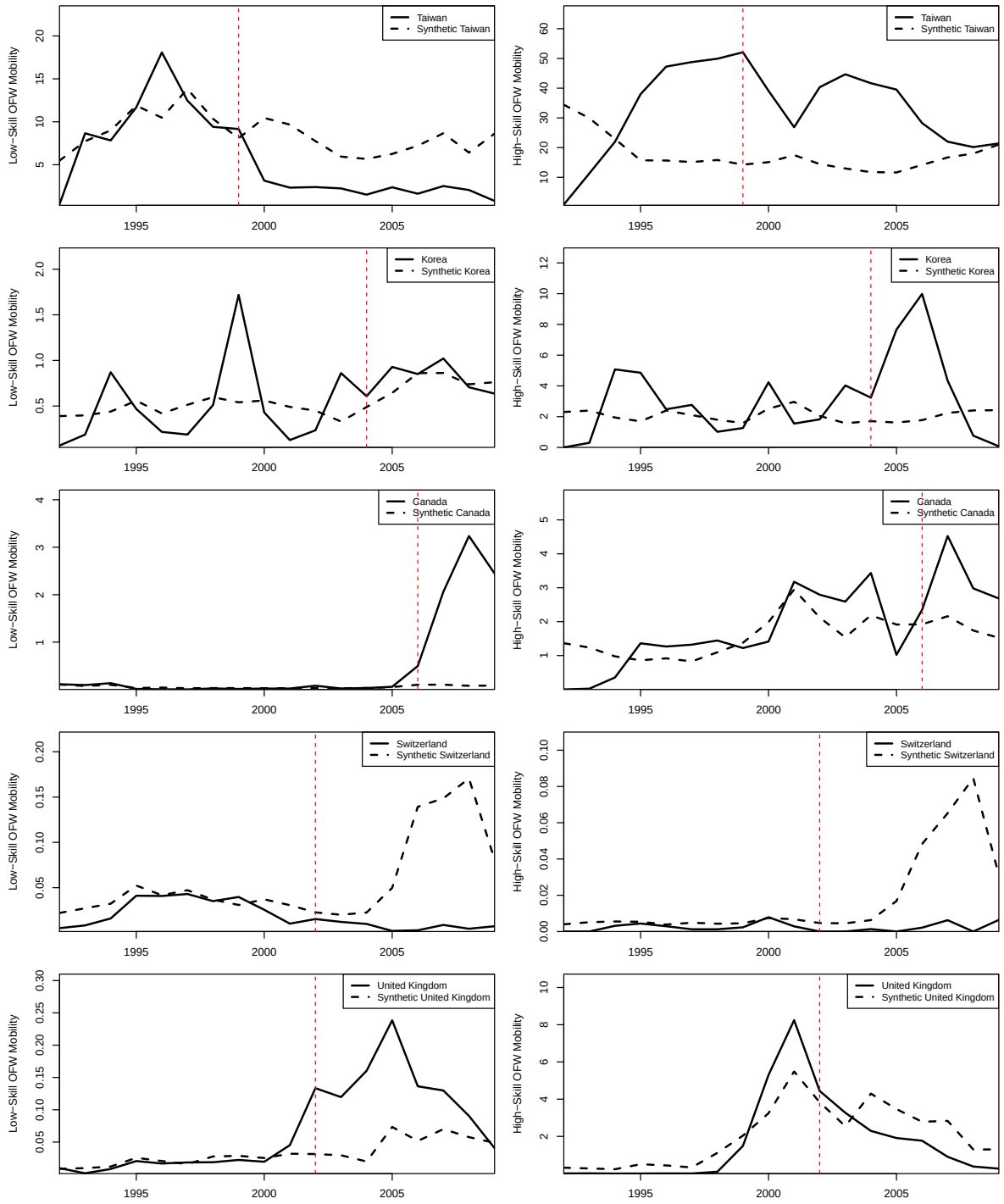


FIG 4.7. Synthetic Control Path Plots: Partial Support or Contradicting Cases. This figure shows how my predictions are partially supported in the case of Taiwan, South Korea, Canada, and Switzerland. In contrast, the predictions are completely contradicted in the UK case.

evidence from migration has so far been rare. My findings using OFW data suggest a more complicated picture: the effects of BLAs are conditioned by the skill level of migrant workers.

In particular, the existence of BLAs is associated with on average 0.46% lower mobility ratios for low-skilled OFWs and 1.26% higher mobility ratios for high-skilled OFWs, which are large differences compared to the mean OFW mobility 0.58%. Furthermore, I find a wide range of heterogeneous BLA effects across skill level in different receiving countries that have signed BLAs with the Philippines.

I argue that this is due to the unique nature of BLAs in contrast to PTAs and BITs: BLAs help solve state-level market failure problems by shifting the costs to migrant workers instead. As a result, the mobility of BLA-regulated labor workers, commonly the low-skilled, decrease due to BLA-induced migration costs. Meanwhile, the mobility of high-skilled labor migrants increase due to the positive externalities of BLAs. This finding reconciles some of the extant negligible or mixed BLA effect findings. To the extent that the findings on OFWs can be generalized to other sending countries, it also raises concern about the effects BLAs are intended to provide. In short, the chapter contributes to the sparse but emerging literature that examines how international migration is regulated under formal international cooperation.

More broadly, these findings suggest several implications. First, the study of formal international cooperation in migration introduces an additional layer of actor preferences absent in the literature. While goods and capital have no preferences of their own, migrants do. As a result, previous studies on formal international cooperation have mostly focused on state and firm preferences. The chapter's focus on human mobility illustrates how the preferences of migrants complicate the interaction between states and firms. Specifically, formal international agreements that solve state-level market failures can produce, unintentionally, different externalities on different migrant workers. This leads to gaps between international institutional design and effect.

Second, the gap between BLAs intentions and effects raises implications for existing political economy literature on migration policy. Extant political economy explanations about migration policy rely on fundamental assumptions about how policies affect the movement of people across borders and determine economic or social distributional consequences that shape domestic preferences. Yet, little empirical work has been done to verify whether such assumptions hold outside of experimental settings. The findings of this chapter illuminate the importance of examining whether migration policy and agreement effects match their intentions. It also informs decision makers on the importance of devising or revising migration policies and agreements that take into account migrant preferences in addition to state and firm preferences.

Third, the heterogeneous treatment effect of BLAs shows the importance of testing theories on the most relevant population and incorporating as fine-grained data available. This

is especially true in empirical studies on migration where individual characteristics can often condition state-level or dyad-level characteristics many scholars of political economy and migration are interested in. Moreover, one may easily confound the effects of state characteristics with those of migrant characteristics absent of more fine-grained data.

Finally, this chapter employs a crude measure of BLAs, i.e. the signing of BLA. In practice, BLAs can vary substantially and thus there can be wide differences even among the BLAs that the Philippines have signed. Furthermore, the flexibility that makes BLAs so attractive may also undermine the effectiveness of BLA enforcement. Results for the effect of BLA existence may thus be biased when BLAs are designed or implemented differently. As a first step, findings from the synthetic control method can thus help identify specific cases in which BLA comparisons may be worth exploring. I leave for future research to contemplate the best way to compare BLAs, conduct more detailed coding of them, and examine how migrant workers respond to different BLA characteristics.

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Appendix

Appendix 4.A Data, Variables, Operationalization

Variable	*Operationalization*	*Source*
OFW Mobility (count)	Count of OFW new hires for a given skill level, receiving country, and year	Constructed based on MTY (2013)
OFW Mobility (ratio)	Count of OFW new hires for a given skill level, receiving country, and year as percentage of total OFW new hires in the same skill level and year.	Constructed based on MTY (2013)
BLA	Receiving country and PHL have a signed BLA (MOU or MOA) in a given year. 1 = yes, 0 = no.	POEA
Skill Level	Skill level of OFW? 1 = high (MTY 2013's level 3 and 4), 0 = low (MTY 2013's level 1 and 2). Average years of schooling for low and high-skill are 12.2 and 14.45, respectively.	Constructed based on MTY (2013)
Median Wage	Median wage of OFW for a given skill level, receiving, and year.	Constructed based on MTY (2013)
Regional BLA	Number of Philippine-involving BLAs existing in same region of the receiving country at t - 5 years.	Constructed based on POEA and UN data
Labor Force	Receiving country people ages 15+ and economically active, total in millions (log).	WDI augmented with TWN National Statistics Data
EU	Receiving country EU membership. 1 = yes, 0 = no.	EU official website
Schengen	Receiving country Schengen membership. 1 = yes, 0 = no.	EU official website
WTO	Receiving country WTO/GATS membership. 1 = yes, 0 = no.	WTO official website
Regime Type	Receiving country mean Unified Democracy Scores (UDS)	Pemstein, Meserve, and Melton (2010)
Real GDP	Receiving country log GDP (constant 2000 USD).	MTY (2013); WDI
Real GDP per capita	Receiving country log expenditure side real GDP at constant 2005 PPPs (in million 2005 USD)/total population in millions	Constructed based on PWT 8.0
GDP growth	Receiving country GDP growth (annual %).	WDI
Partner Trade Dependence	Bilateral trade of goods (exports + imports)/ receiving country expenditure side real GDP (IHS).	Constructed based on UN Comtrade and PWT 8.0
PHL Trade Dependence	Bilateral trade of goods (exports + imports)/ Philippines expenditure side real GDP (IHS).	Constructed based on UN Comtrade and PWT 8.0
Cumulative OFW Count	Receiving country cumulative count of OFW in the same skill level since 1992 (IHS).	Constructed based on POEA data
PTA	Receiving country PTA in force with PHL. 1 = yes, 0 = no.	Department of Trade and Industry (DTI), PHL.
BIT	Receiving country BIT in force with PHL. 1 = yes, 0 = no.	UNCTAD
Migrant Stock	Stock of PHL-born population in the receiving country (IHS).	WB Global Migration Database; POEA; TWN National Statistics

Table 4.A.1. Variables, Operationalization, Sources

Variable	$\bar{x}$	**Min**	**Max**	**n**	**#NA**
OFW Mobility (ratio)	0.58	0.00	79.26	6228	0
OFW Mobility (count)	699.43	0.00	86701.00	6228	0
BLA	0.06	0.00	1.00	6228	0
Skill Level	0.50	0.00	1.00	6228	0
Median Wage	763.81	200.00	2632.79	1327	4901
Regional BLA	0.57	0.00	6.00	6228	0
Labor Force (millions)	16.11	0.06	802.22	6114	114
Schengen	0.06	0.00	1.00	6228	0
WTO	0.59	0.00	1.00	6228	0
Regime Type	0.23	-2.02	2.25	6138	90
Real GDP (ten millions)	18923.29	9.22	1170000.00	5992	236
Real GDP per capita (thousands)	10.55	0.15	116.42	5616	612
GDP growth	3.80	-50.25	106.28	5968	260
Partner Trade Dependence	0.14	0.00	4.23	3082	3146
PHL Trade Dependence	0.23	0.00	7.32	3400	2828
Cumulative OFW Count (thousands)	5.67	0.00	793.34	6228	0
PTA	0.05	0.00	1.00	6228	0
BIT	0.11	0.00	1.00	6228	0
Migrant Stock (thousands)	18.49	0.00	2836.49	3796	2432

TABLE 4.A.2. Descriptive Statistics. Without Log or Inverse Hyperbolic Sine Transformations.

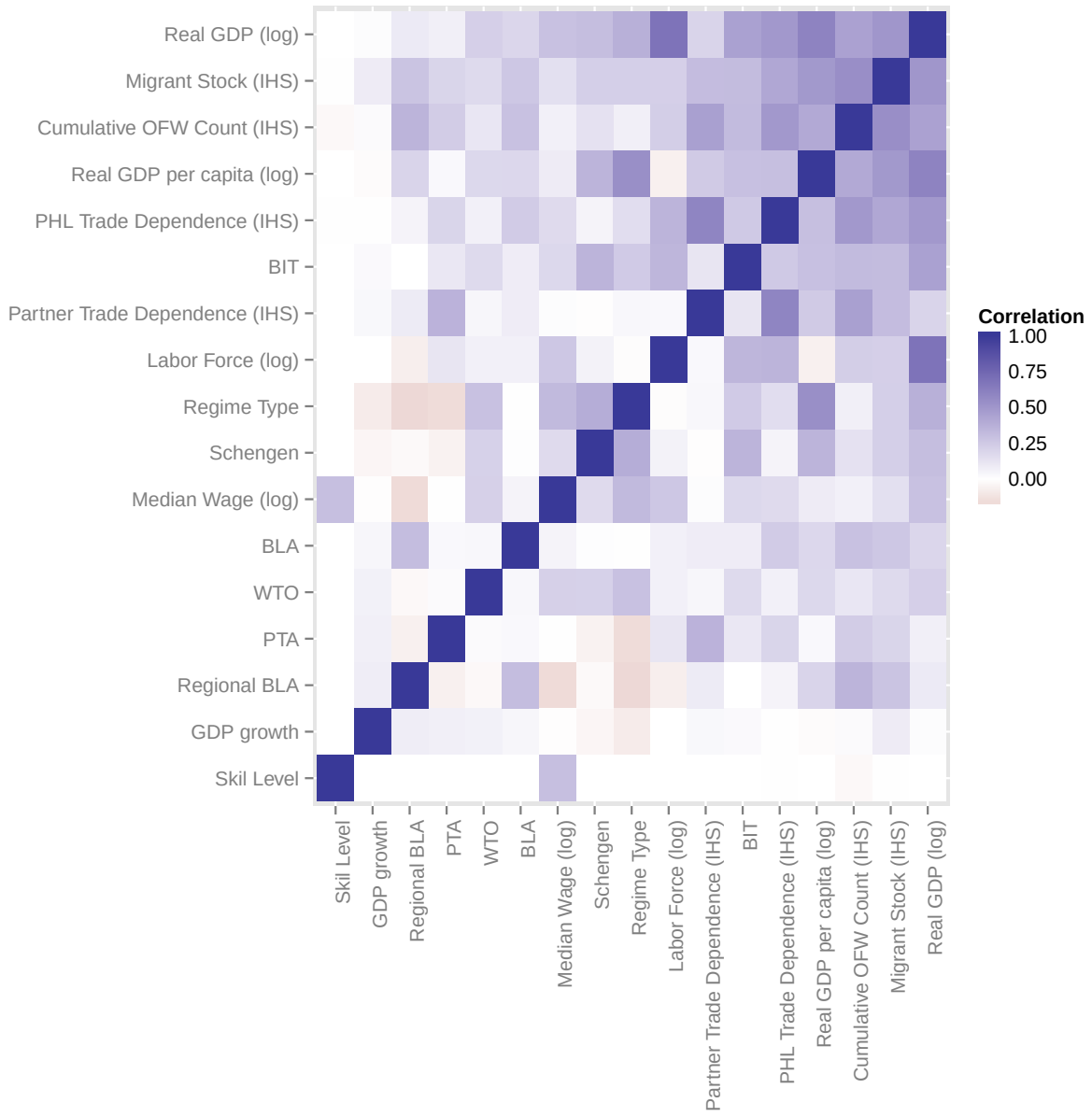

FIG 4.A.1. Covariate Correlation Matrix. Correlations between numeric variables are Pearson product-moment correlations, correlations between numeric and ordinal variables are polyserial correlations, and correlations between ordinal variables are polychoric correlations.

Appendix 4.B Parameter Estimates

	Posterior Mean	Posterior Median	2.5%	97.5%	Prob. < 0
BLA	-0.46	-0.46	-0.93	-0.01	0.98
Skill Level	-0.02	-0.01	-0.14	0.10	0.59
BLA*Skill Level	1.71	1.69	1.29	2.13	0.00
Median Wage	-0.07	-0.07	-0.23	0.06	0.82
Regional BLAs	-0.21	-0.21	-0.30	-0.11	1.00
Labor Force (log)	0.09	0.09	-0.09	0.32	0.22
Schengen	-0.20	-0.20	-0.56	0.15	0.87
WTO	-0.12	-0.13	-0.29	0.05	0.92
Regime Type (UDS)	-0.19	-0.19	-0.40	0.03	0.96
Real GDP (log)	0.05	0.05	-0.09	0.18	0.23
Real GDP per capita (log)	-0.01	-0.01	-0.19	0.19	0.54
GDP growth	0.00	0.00	-0.00	0.01	0.20
Partner Trade Dependence (asinh)	0.02	-0.03	-0.75	0.85	0.52
PHL Trade Dependence (asinh)	0.33	0.34	-0.32	0.93	0.17
Cumulative OFW Count (asinh)	0.30	0.30	0.26	0.35	0.00
PTA	-1.26	-1.27	-1.94	-0.60	1.00
BIT	-0.48	-0.48	-0.79	-0.20	1.00
Migrant Stock (asinh)	0.02	0.02	-0.01	0.04	0.15

Table 4.B.1. Fitted Results for Bayesian Linear Mixed Effects Model. Intecepts for year and receiving country excluded to facilitate presentation.

	Posterior Mean	Posterior Median	Central Credible Interval	Probability < 1
Low-Skill OFW	-0.46	-0.46	[-0.93 , -0.01]	0.98
High-Skill OFW	1.25	1.26	[0.77 , 1.7]	0.00

Table 4.B.2. BLA First Difference Estimates for Low-Skill versus High-Skill OFW Mobility

	OLS		Quasi-Poisson	
	Cty FE	Cty & Year FE	Cty FE	Cty & Year FE
BLA	−0.505*	−0.554*	−0.230*	−0.265^
	(0.252)	(0.252)	(0.092)	(0.098)
Skill Level	−0.024	−0.036	−0.716***	−0.192^
	(0.062)	(0.062)	(0.063)	(0.076)
BLA*Skill Level	1.810***	1.804***	0.969***	0.463**
	(0.227)	(0.227)	(0.073)	(0.089)
Median Wage	−0.071	−0.009	−0.064	−0.084
	(0.077)	(0.077)	(0.141)	(0.181)
Regional BLAs	−0.235***	−0.226***	−0.169***	−0.158***
	(0.049)	(0.051)	(0.013)	(0.021)
Labor Force (log)	0.202	0.324	0.976*	0.559^
	(0.179)	(0.267)	(0.240)	(0.228)
Schengen	−0.120	−0.102	0.122	1.020***
	(0.188)	(0.192)	(0.283)	(0.242)
WTO	−0.149^	0.190	0.040	0.419***
	(0.085)	(0.127)	(0.065)	(0.060)
Regime Type (UDS)	−0.093	−0.044	−0.141*	−0.040
	(0.124)	(0.125)	(0.057)	(0.047)
Real GDP (log)	0.107	0.196	0.562	2.583***
	(0.132)	(0.139)	(0.318)	(0.197)
Real GDP per capita (log)	−0.068	−0.085	0.209*	−0.018
	(0.108)	(0.108)	(0.080)	(0.063)
GDP growth	0.004	0.008^	0.027***	0.028***
	(0.004)	(0.005)	(0.003)	(0.003)
Partner Trade Dependence (asinh)	−0.055	0.016	−0.465	−0.548*
	(0.614)	(0.624)	(0.217)	(0.108)
PHL Trade Dependence (asinh)	0.273	0.137	−0.159	0.048
	(0.454)	(0.461)	(0.129)	(0.154)
Cumulative OFW Count (asinh)	0.285***	0.324***	0.096***	0.518***
	(0.024)	(0.025)	(0.009)	(0.013)
PTA	−1.313**	−1.150**	−1.673***	−0.370^
	(0.398)	(0.399)	(0.186)	(0.184)
BIT	−0.539***	−0.496**	−0.537*	0.123
	(0.159)	(0.163)	(0.111)	(0.111)
Migrant Stock (asinh)	0.011	0.029^	0.044^	0.028
	(0.012)	(0.016)	(0.017)	(0.015)
Num obs.	6228	6228	6228	6228
Log Likelihood	−13435.726	−13422.335		
AIC	27255.452	27262.670		

(*Notes.* $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\wedge}p < 0.1$
Standard errors in parentheses. p-values calculated based on t-distribution with degrees of freedom adjustment under multiple imputation.)

TABLE 4.B.3. Robustness Model Results.

Chapter 5

Conclusion

Understanding why and how political forces shape flows of economic globalization has always been central to the study of International Political Economy (IPE). Extant IPE literature in migration has focused on the causes and consequences of permanent migration but overlooked temporary migration. This focus contrasts how extant research in trade and finance has advanced our understanding of globalization by distinguishing between temporary and permanent flows. It also implies that extant literature misses *at least* half of the flows within the global phenomenon of international migration. To fill in this gap, the dissertation sought to address the following questions: How do political forces shape temporary labor migration? To what extent and why? What are the implications for the existing literature?

In Chapter 2, the dissertation argued that multinational firms shape the implementation of immigration laws through bureaucratic lobbying despite public attitudes setting immigration laws in the legislature. Firms take such political actions to facilitate the mobility of their high-skilled intra-company transferees who hold proprietary knowledge and are essential for productivity. Using original data, the chapter showed that firms are both effective and strategic when lobbying on intra-company transfer visa regulations, albeit collective action problems still undermine their lobbying.

The chapter challenges the common focus on individual and public attitudes in the extant immigration literature. Instead, it demonstrates the importance of *firms* and their preferences in immigration policy formation. Such findings, however, do not suggest that firms are dominant political actors in *all* types of migration policy formation. Different migration policies imply very different relevant actors, preferences, and political dynamics as discussed in the introduction. While firms play a key role in shaping policies targeting temporary migrant workers, it is possible that public opinion still dominates the formation of policies targeting permanent immigrants. In other words, the dissertation contributes by theorizing the origins and testing the implications of the former policies, which is currently underde-

veloped in the literature. Although the dissertation does not empirically examine public opinion and its impact on latter policies, it takes an essential next-step towards understanding the relative influence of different domestic actors on different aspects of migration policy. Overall, given how much different migrant characteristics matter in domestic politics, the attempt in the literature to explain *general* migration policy outcomes from the onset may be an elusive quest. Instead, the dissertation shows that it may be more fruitful to first examine specific migration policies, identify key actors, and then trace the channels through which the actors influence policymaking. Based on these findings, researchers can then build more general theories that take into account the *conditions* that give certain political actors more influence.

What are the implications on immigration policy reform in the United States? As of May 2015, immigration reform remains in deadlock in the Congress—the Immigration Reform and Control Act of 1986 was the most recent major immigration reform enacted in the United States. The findings have two main policy implications. First, comprehensive immigration reform bundling together migration policies targeting both permanent immigrants and temporary migrants will remain difficult to pass in the Congress. Even if legal and highly skilled temporary migrants have the support of firms and face less public opposition, "the path to citizenship" remains highly controversial. Therefore, in a political arena where legislators maximize office, concerns about permanent immigrants will continue to "trump" temporary migrants. In contrast to "comprehensive" immigration reform, an alternative and perhaps more feasible strategy is step-wise reforms that first tackle temporary migration and then pathways to citizenship for legal and illegal migrants. Second, with the current deadlock in the Congress, the influence of actors on the implementation of migration policies by agencies will play an increasingly important role in immigration politics. Aside from firm-lobby examined in the dissertation, Obama's executive order on immigration is also a prominent example. However, even though migration liberalization through this route may promote economic efficiency, it ultimately raises concerns about the functionality of democratic representation, and normative questions about the inequality in mobility among migrant.

In Chapter 3, the dissertation argued that states shape the mobility of MNC professionals and patterns of knowledge transfers by varying common visa regulations. Using original data, the dissertation showed that MNC professionals enter the U.S. more frequently from countries given more relaxed visa regulations even when adjusting for various confounders. Furthermore, the recent surge of Indian intra-company transfers to the U.S. is associated with more relaxed country-specific visa regulations in 2006.

By focusing on the mobility of temporary high-skilled MNC intra-company transfers,

the chapter provided a more precise measure of cross-border knowledge transfers than those based on trade and FDI flows in the literature. It also demonstrated how political science can contribute to the emerging field of migration and development—by showing how states, as political actors, has the potential to shape developmental patterns in both receiving and sending countries through migration policies. This broader claim about development is not directly tested in the dissertation. However, future research may be able to exploit migration policies as instruments to identify the effect of temporary intra-company transferees on firm-level productivity or innovation in the receiving countries. Additionally, future research can also examine the economic impact of MNC transferees returning to their sending countries. Supportive evidence along this line of inquiry has important policy implications given increasing interest within the United Nations, World Bank, and policy circles about migration as a development strategy. Ultimately, states may then incorporate the ability of harnessing temporary labor migrants to extant development policy tools such as remittances and foreign aid.

In Chapter 4, the dissertation focused on Bilateral Labor Agreements (BLAs) that states sign in attempt to facilitate the mobility of temporary migrant workers. The chapter argued that formal international agreements that solve labor market failures between countries increase transaction costs for migrant workers. Therefore, BLAs shape patterns of temporary labor migration in unintended ways depending on the ability of migrant workers to overcome agreement-induced costs. Exploiting unique Filipino migrant worker data, the chapter showed that the existence of BLAs is associated with lower (higher) mobility for low-skilled (high-skilled) temporary migrant workers.

The chapter challenges the common premise in International Relations that international institutions promote cross-border economic integration by mitigating problems with market failures. In particular, the study of formal international cooperation in labor migration introduces an additional layer of actor preferences absent in the literature. While flows such as goods and capital have no preferences of their own, migrants do. As a result, previous studies on formal international cooperation have mostly focused on state and firm preferences. The dissertation illustrates how the preferences of migrant workers complicate the interaction between states and firms. Specifically, formal international agreements that solve state-level market failures can produce, unintentionally, different externalities on different migrant workers. This leads to, and calls for more research on, gaps between international institutional design and effect.

The chapter has important policy implications on the trade-off between securing migrant worker rights in host countries and promoting migrant worker mobility as a development strategy. While additional requirements in BLAs strengthen migrant labor rights and work-

ing conditions, migrants ultimately bear the costs. This implies that migrant workers, who benefit most from better labor rights and migration as a development strategy, may no longer afford to leave. Regardless whether these migrants turn to illegitimate channels or simply give up on migration as a development strategy, it is thus important for policymakers to rethink how to design mechanisms and requirements within BLAs that balance the trade-off.

The framework of the dissertation and its findings serve as building blocks for three new research agendas. First, I plan to investigate the impact of investment visa regulations on real estate and inequality. The research will focus on how changes in immigrant investment visas in countries such as the United States and Canada have increased the international mobility of the global rich. I hypothesize that the mobility of these rich migrants either raises demand in high-end metropolitan housing markets or attracts real estate speculation by foreign buyers.[1] Increased returns from real estate, in turn, explain growing income inequality in receiving metropolitan areas. This latter mechanism has attracted increasing attention in the Economics literature on inequality.[2] Following the approach of the dissertation and its focus on firms, I plan to examine the politics behind investment visa regulations and its impact on inequality in two separate papers. Overall, this research seeks to bridge literatures on international migration and inequality.

Second, I plan to expand the study of high-skilled individuals from intra-company transferees to H-1B visa holders. I have recently acquired original data on all United States employer-level high-skilled H-1B accepted or rejected petitions since the early 1990s through a separate Freedom of Information Act (FOIA) request. The data consists around four million observations and variables such as job classification and petition results. Using the data, I plan to exploit in one paper the H-1B visa lottery system introduced in 2008 to identify the effect of H-1B visas on firm-level productivity.[3] In a separate paper, I plan to develop and test implications of inter-*firm* labor mobility on firm's lobbying behavior on immigration. L-1 and H-1B holders are considered similar in skill-levels but different in their mobility between firms. For one, L-1 visa holders are required to be current MNC employees while H-1B holders are not. For another, L-1 workers hold MNC specific knowledge capital while H-1B

[1]For example, many upper-class Chinese have recently acquired legal permanent resident status for themselves or their children in the United States through the EB-5 investment visa. See "Want a Green Card? Invest in Real Estate" http://www.nytimes.com/2015/05/17/realestate/want-a-green-card-invest-in-real-estate.html?src=twr&smid=tw-nytimes and "The Chinese are Coming, and They'd Like to Buy Your House" http://www.washingtonpost.com/posteverything/wp/2014/07/15/the-chinese-are-coming-and-theyd-like-to-buy-your-house/

[2]See, for example, "NIMBYs in the Twenty-First Century" http://www.economist.com/blogs/freeexchange/2015/03/wealth-inequality

[3]The lottery system accepts petitions based on a random algorithm.

workers hold more general skill sets. Furthermore, H-1B visas are capped annually while L-1 visas are not. This facilitates mobility for H-1B visa holders through firm competition for talent that is absent for L-1 visa holders. Exploiting such differences, I plan to examine how firm's lobbying behavior on immigration—intensity, target venue, collective action—differs depending on their reliance on migrants holding the two visas.

Third, more broadly, I plan to compile a visa-level data set on migration policy for the United States and its partners. Additional to the L-1, H-1B, and EB-5 visa mentioned above, visa policies for other types of migrants also imply different important political actors and dynamics. For example, international students (F-1) and the political actions of institutions of higher education, nurses (H-1C) and political actions within the healthcare industry, or tourists (B-2) and political actions within the service industry. The goal of the data set is to leverage different migrant characteristics based on visa categories—and conditional on origin country characteristics—to gain insights on the formation of specific migration policies. In a sense, this approach parallels conjoint survey experiments (Hainmueller and Hopkins 2014) that leverage heterogeneity within migrants to explain immigration attitudes or policy outcomes, but in an observational setting.

I hope that this dissertation and broader research program leads to many more valuable insights on how different political actors interact in different arenas to shape migration (policy) outcomes, and more broadly, how political forces shape flows of economic globalization.