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by

Pedro Fernandes Makhoul

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ABSTRACT OF THE DISSERTATION

Cross-Border Acquisitions and Ownership

by

Pedro Fernandes Makhoul

Doctor of Philosophy in Management

University of California, Los Angeles, 2022

Professor Christopher W. Poliquin, Co-Chair

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This dissertation examines firms' corporate and global strategies, specifically the use of ownership design as a strategic tool. The three chapters explore different perspectives on the potential use of ownership structures to overcome certain barriers firms may face in their corporate and geographic expansion. The first chapter looks at the global portfolio of Sovereign Wealth Funds (SWFs), large state-owned institutional investors, and shows how their reach is much larger than previously accounted for once one includes indirect investments. An analysis of the pyramidal investments of SWFs reveals that, while subsidiaries seem to have a fair amount of autonomy in deciding the location of further investments, this autonomy mostly apply to smaller investments. The findings indicate that the management of important issues in such large investors are mostly centralized, and that ownership structures are likely used to smoothen frictions of foreign investments. The second chapter investigates the ownership patterns of firms around the world and challenges the longstanding common knowledge about the use of pyramidal structures as a control enhancing

tool. Instead, it proposes that more vertical ownership designs can maximize managerial efficiency in face of industrial and geographic diversification. The findings that over 75 percent of pyramidal ownership paths have virtually no separation between cash flow and voting rights, and that firms with broader (both industrial and geographic) and more unrelated portfolios have more vertical ownership designs are consistent with the view of managerial efficiency. Finally, the third chapter presents an experimental measurement for one of the most challenging issues foreign firms must face, namely nationalism. Employing conjoint analysis, the chapter provides a causal estimate for the disadvantage of being foreign in the setting of a domestic acquisition. It shows there is a strong component of anti-foreign sentiment in public opinion, and that such effect is quite difficult to overcome through market mechanisms. Connecting with previous chapters, a possible mechanism to overcome this liability of foreignness is the adoption of more vertical and opaque ownership structures that can “hide” the true origin of firms and shareholders.

The dissertation of Pedro Fernandes Makhoul is approved.

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CHAPTER 1

Going the Distance: The Foreign Investment Strategies of Sovereign Wealth Funds

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1.1 Introduction

According to the most recent estimation of the Sovereign Wealth Fund Institute, sovereign wealth funds (SWFs)—state-controlled funds with the purpose of investing a portfolio of assets, including in foreign companies and other investment vehicles (IFSWF, 2008; p.3)—hold over US$7.5 trillion in assets under management (AUM). Since these funds invest over 80% of their portfolios in foreign investments, they are faced with the decision of where to invest and their location decisions, like in any other type of foreign direct investment (FDI), are influenced by a set of cross-national *distances*, such as geographic (i.e. the physical distance between the home country of the SWF and the target country of the investee) and cultural distance (i.e. the extent of differences in norms and values between two countries) (e.g., Berry et al. 2010, Beugelsdijk et al. 2018, Chhaochharia and Laeven 2008, Grinblatt and Keloharju 2001). As such, larger distances are often associated with greater asymmetries of information, therefore diminishing the likelihood of foreign investment (Berry *et al.*, 2010; Dunning, 1998; Ghemawat, 2001).

In fact, a vast body of literature has found support for the idea that distances are key determinants of location choices for the investments that multinational enterprises (MNEs) and SWFs make directly into foreign subsidiaries (e.g., Berry et al. 2010, Beugelsdijk et al. 2018, Flores and

Aguilera 2007, Knill et al. 2012a). However, we know less about whether distances affect in the same way the indirect investments SWFs make. This is relevant because SWFs, like large MNEs, are complex investors that hold both direct and indirect investments (Murtinu and Scalera, 2016), i.e., they have stakes managed by their affiliates via ownership pyramids. For instance, Temasek Holdings (one of the SWFs of Singapore) directly holds the whole equity of Level 3 Communications Inc. in the United States, which in turn has a wholly owned subsidiary in Brazil called Level 3 Participações e Comercial Ltd (an indirect investment).

The presence of complex ownership pyramids creates fundamental challenges in the analysis of distances and their effect on the decision of where to invest. At first glance, we could expect that distances should be less consequential for indirect than for direct investments for two reasons. First, when a SWF invests in an affiliate, the fund itself may not be directly involved in the location decisions its affiliates make, as it may delegate to the latter's managers, partially or fully, the decision-making capacity to make further investments (Belenzon, Hashai, and Patacconi, 2019a; Fan, Wong, and Zhang, 2013). Second, because indirect investments essentially involve pyramidal ownership structures, they tend to diminish the cash flow rights of SWFs in their investees as they go down the ownership pyramid[1] (Faccio and Lang, 2002; Wolfenzon, 1998), lowering their attention to the risks brought on by large distances in indirect investments.

Yet, this logic ignores the fact that SWFs strategically choose the size of their investments. For example, a SWF may have a majority stake in a holding company, which in turn invests a very large sum into a minority or majority position in a target company. In this case, although the SWF's stake is indirect, the size of the cash flow accompanying the investment is substantial, which

[1] For instance, imagine a case where a SWF owns 10% of company A, which in turn owns 10% of company B, which in turn owns 10% of company C, which is valued at US$1,000,000. In the end, the ownership of the SWF over company C is calculated as 10% x 10% x 10% x $1,000,000, which equals 0.1% x $1,000,000, or US$1,000.

increases the overall risk exposure of the fund. In other words, SWFs will pay more attention to their indirect stakes, and the various hazards brought on by higher distances, when the size of the investment is large. That is why we hypothesize, adjusting for the size of the investment, that distances should affect indirect investments approximately as much as they affect direct investments.

We examine the comparative effects of distances on the investments 23 SWFs from 16 countries make in their investees, both directly and indirectly, up to five levels down the ownership pyramid. Consistent with our previous discussion, when we analyze the location decisions of SWFs simply as a dichotomous choice of where to invest, we find that distances have a larger effect on the location of direct investments than on indirect investments. However, once we use the *amount* invested in each target country relative to the overall portfolio of each fund as a dependent variable, our regressions confirm that distances affect both direct and indirect investments equally. Therefore, the sole emphasis on how distances affect direct investments provides a partial and incomplete picture of the international expansion of SWFs and the factors that guide their location decisions.

We follow an exploratory, inductive approach, examining our data in detail and unveiling novel patterns that then inform the theory (Bennett and Feldman, 2017; Lyngsie and Foss, 2017; Wang and Shaver, 2016). Along these lines, we also examine the moderating role of the specific *traits* of SWFs, such as their strategic orientation—e.g., how much they seek financial returns vs. other objectives (Aguilera, Capapé, and Santiso, 2016), and board composition –e.g., how politicized or professional it is (Bernstein, Lerner, and Schoar, 2013). Overall, we find that heterogeneous traits at the fund level have some influence but do not broadly moderate the effect of distances on the portfolio allocation decisions of SWFs.

Our study contributes to the literature on SWFs by showing the importance of distances even in contexts where these funds invest via indirect vehicles. Indeed, our work suggests that SWFs use these indirect investments strategically, given that distances appear to matter when these investments represent a relevant portion of the fund's portfolio. This finding is important not only because it shows the need to consider a broader array of investment targets when studying SWFs, but also because, in practice, the presence of indirect investments in the portfolio of these funds is ubiquitous.

Our findings also have important implications for the literature on FDI and MNEs. This literature has largely focused on direct investments when looking at the effect of distances on a variety of internationalization patterns (Benito and Gripsrud, 1992; Berry *et al.*, 2010; Hutzschenreuter, Voll, and Verbeke, 2011; Kang and Jiang, 2012; Kogut and Singh, 1988; Zhou and Guillén, 2015). More recent research, however, has found that MNEs commonly invest in subsidiaries via indirect intermediaries. Belenzon et al. (2019) argue that these indirect investments create "organizational distances" in the overall corporate structure of MNEs, *lowering* the attention that managers give to distant subsidiaries. In contrast, our study suggests that managerial attention in foreign investments crucially depends on the size of these investments. Thus, managers may *increase* the attention they pay to indirect investments when they are highly relevant because they are larger. In other words, failing to account for the size of those indirect investments may provide only a partial picture of the strategizing behavior of funds and MNEs managing complex ownership pyramids, underestimating the effect of distances on the international expansion of firms.

In the following section, we briefly summarize the literature on the role of distances as determinants of internationalization outcomes. The third section examines the recent literature on SWFs, while the fourth one presents our data and methodology. The fifth section presents the

results. We then conclude by discussing the implications of our findings for the literature on SWF and FDI in general.

1.2 The Effect of Distances on Foreign Investments

The literature that studies distances as determinants of investments between two countries usually associates distances with higher information asymmetries and increased transaction costs to enforce contracts across borders (Berry *et al.*, 2010; Dunning, 1998). Based on this idea, scholars in international business have long studied cross-country distances as important factors for a wide range of investment decisions. "Gravity" models of foreign trade and investment imply that *geographical* distances are key determinants, especially because proximity makes trade and investment in nearby and similarly rich countries easier (Anderson, 1979; Anderson and van Wincoop, 2004; Bergstrand, 1985). For instance, there is evidence that investors prefer to buy stocks in companies from their home countries or in geographically close countries—the so-called "home bias" (Portes and Rey, 2005).

Kogut and Singh (1988) expanded the analysis of distances by introducing a measure for *cultural* distance between two countries. Based on the work of Hofstede (1980), they operationalized cultural distance as an aggregate measure of the differences between the Hofstede's cultural dimensions of two countries. Overall, studies have found that cultural distances explain a broad range of international expansion decisions, such as location choice, entry mode, and the extent of ownership. For instance, Hutzschenreuter, Voll, and Verbeke (2011) study the effect of cultural distances on the international expansion of multinationals, and find that high levels of added cultural distance increases dynamic adjustment costs and discourages further expansion (see also Beugelsdijk *et al.* 2018b). This literature has underscored that, apart from economic or geographical considerations, cultural distances increase the cost of enforcing contracts and of

monitoring managers abroad (Berry *et al.*, 2010), thereby increasing the multinationals' liability of foreignness (Marano, Tashman, and Kostova, 2017; Zaheer, 1995).

The literature has also refined the notion of cultural distances by considering *religious* distance as an important determinant of investment (Hilary and Hui, 2009; Stulz and Williamson, 2003). Religious distance is defined as how much the religious composition of a country's population differs from other countries. Arguably, lower religious distance affects investment decisions because it leads to an informational advantage—e.g., similar religious and cultural traditions can reduce information asymmetries about potential investment opportunities—or simply because firms are more likely to invest in countries with similar norms and cultural values.

Finally, there is a large literature that regards *institutional* distance as a key determinant of internationalization decisions (Kostova, 1996, 1999; Kostova and Zaheer, 1999; Xu and Shenkar, 2002). Institutional distance can be defined as the extent to which the 'rules of the game' (North, 1990)—e.g., regulatory quality, political stability, rule of law, corruption, etc.— differ between two countries. Investments spanning large institutional distances increase the liability of foreignness because of the rise in unfamiliarity, relational, and discriminatory hazards foreign firms face (Eden and Miller, 2004). Thus, institutional distance has been found to influence international strategies of MNEs, e.g., their location choices (Flores and Aguilera, 2007), their entry mode (Davis, Desai, and Francis, 2000; El Said and McDonald, 2002), and the degree to which foreign firms copy the practices of local firms (Salomon and Wu, 2012).

1.3 Sovereign Wealth Funds and their Location Decisions

SWFs are large and pervasive investors in the global arena. Their total assets under management (AUM) went from $3 trillion in in 2010, to $7.5 trillion in 2019 (a compound annual growth rate of 9.5% per year). In the early 2000s, SWFs made only dozens of equity investments per year,

while after 2006 they made over 200 transactions per year, making them one of the largest and most active institutional investors in the world (Guedhami, 2012).

Because SWFs are state-owned, they have also been perceived as vehicles of geopolitical influence, especially when they are from countries with authoritarian governments (Carney, 2018; Cuervo-Cazurra *et al.*, 2014; Rose, 2017). This perception has thus increased the legitimacy concerns these funds face when they invest abroad: very much like state-owned multinationals, SWFs may be charged with fulfilling geopolitical objectives on behalf of state actors and their allies (Bremmer, 2010; Calluzzo, Dong, and Godsell, 2017; Cuervo-Cazurra *et al.*, 2014; Knill *et al.*, 2012; Lavelle, 2017; Megginson and Fotak, 2015). A typical concern, for instance, is that SWFs may be used to acquire strategic assets or companies with state-of-the-art technology or natural resources that can be considered of significant national importance (Chhaochharia and Laeven, 2008). Arguably, these concerns magnify the frictions associated with larger distances. SWFs will not only have to overcome information asymmetries and enforcement costs associated with their investees, but the mere presence of SWFs as investors may increase potential conflict when their home countries are seen as distant from their targets.

Indeed, there is evidence that SWFs, like multinational companies, incorporate distances in their international investment decisions. A growing literature studies the determinants of SWF investments at the country level using a broad set of distance measures (Chhaochharia and Laeven, 2008; Hernández and Nieto, 2015; Knill *et al.*, 2012). For instance, Chhaochharia and Laeven (2008) find that countries with more common culture attract more investments, especially when cultural proximity is measured using religion.

However, this body of literature largely focuses solely on the effects of distances on *direct* investments, even though SWFs make frequent use of intermediary companies (investment

vehicles) to invest in foreign countries (Murtinu and Scalera, 2016). The emphasis on direct investments is not problematic if indirect stakes are not particularly relevant for SWFs. One might argue, for instance, that the management of indirect investments are delegated to the executive of the investee firms (Belenzon *et al.*, 2019a; Fan *et al.*, 2013). Following this logic, one might expect that the effect of distances on location decisions will be relatively more relevant for direct than indirect investments. Yet the attention that SWF managers give to their investments may also depend on the investment's relative importance. Thus, large investments in the portfolio of SWFs may increase managerial attention even when they involve indirect ownership stakes. In other words, the effect of distances on indirect investments may also be highly relevant when SWFs hold large investments down their ownership pyramids. Examining this possibility allows us not only to test the relative importance of distances on various sorts of investments, but also scrutinize the relevance of examining both direct and indirect stakes in international expansion decisions.

1.4 Data and Methods

1.4.1 Database of SWFs

In this section, we explain our methodology to unveil the effect of distances on the investment decisions of SWFs. Collecting data from SWFs is challenging because these funds do not publish complete data of their portfolio holdings and because they use a variety of vehicles to pursue their cross-border investments (Murtinu and Scalera, 2016). In order to overcome these two problems, in this paper we take an alternative approach. We collect data from BvD Orbis on the equity stakes of 23 SWFs from 16 countries by looking not only at their direct equity stakes in corporations and private firms but also tracking the equity stakes in the affiliates of their affiliates, and so forth, up to five levels down.

Let us illustrate how these SWFs pyramidal investments may work with an example. Qatar Investment Authority (QIA), the SWF of Qatar, invests in the privately held Qatar Holdings (100%). Qatar Holdings, in turn, holds 55% of Qatar Telecom (QTEL). QTEL then invests in companies like the National Mobile Telecommunications Company of Kuwait, the Omani Qatari Telecommunications Company, and a variety of publicly traded and privately-held companies in Algeria, Iraq, Tunisia, and Indonesia. Thus, an apparent local investment by QIA in Qatar Holdings then leads to a variety of investments in publicly traded companies in a variety of countries. Following the standard methodology in the literature on SWFs, the investment of QIA in this case would have stopped with Qatar Holdings and would have been counted as a local investment.

We follow standard practice in coding equity ownership in pyramids according to ultimate ownership. For instance, if a SWF owns 50% of an affiliate and that affiliate in turn owns 5% of equity in Qatar Telecom (Qtel), we code the SWF ownership of Qtel as 50%*5%=2.5% (Faccio *et al.*, 2002). We also collect data on the operating revenues of the investee firms, which serve as a proxy for the size of the SWFs investment.

The SWFs included in our sample are in Table 1. Even if we do not have data for all the SWFs in the world, our database includes the largest SWFs in the world. Out of the list of 15 largest SWFs of the SWF Institute, our database includes information for 12 of them. In Table 1 we also show the number of direct investments by each of the SWFs in our sample, the number of countries they reach with those investments, and then we repeat this exercise for indirect investments (up to five levels down in the ownership pyramids). We further restrict our sample to include only the SWFs' investments that controls more than 50% of the investee—that is, majority investments. It is clear that once we include the pyramidal investments, the geographical scope of investments increases

significantly as well as the number of investments by these funds. Following the standard methodology of location choices, we would have identified only 1,096 direct investments by 23 SWFs in 66 countries. Yet, including indirect investments yields 270,071 equity investments by SWFs in 205 countries. Even when we discard all the minority investments, there is a significant increase on both the number of investments and countries invested when we account for indirect stakes. This is an indication that indirect investment may indeed be used strategically, at least in some cases. In this subset of investments, SWFs *control* the investees, and thus have enormous influence on their investment decisions. Hence, the fact that we find a larger geographical diversification when only considering majority investments is an important indication that funds may do this strategically.

1.4.2 Measures

Our key variables are included in Table 2. We are interested in understanding how distances affect the location choices and portfolio allocation decisions of SWFs, both for direct and indirect investments. Therefore, we use a set of variables comprised of cultural, geographical, religious and institutional distances as our main predictors.

Dependent variables

The dependent variables on this study capture the SWF's location choice for international investments and the relative importance of the amount allocated in each country. The first variable is binary and captures if the SWF *i* invests or not in the target country *j*. The logit model will give us the coefficient of the likelihood that a SWF will invest in either a direct or indirect investment in the target country *j* for each of the distance variables we are going to include.

The second variable, which captures the *importance* of the investment in the SWFs's overall portfolio, was constructed using both the ownership stakes and the operating revenue data available in our database. This specification allows us to create a variable that measures the claims of operational revenues for all the investments in a country normalized by the total claims of operational revenues for all investment across all countries.

In this sense, our measure of relative cash flow claims per country allows us to study SWF investments according to their weight in terms of absolute cash flows per country. We do this in the following way. Let R_{ijk} denote the operating revenue and λ_{ijk} the ownership percentage of affiliate k owned by SWF i in country j. We then construct the variable $CF_{ij} = \frac{\sum_k R_{ijk}\lambda_{ijk}}{\sum_j \sum_k R_{ijk}\lambda_{ijk}}$, in which the numerator is the sum of the cash flow rights of SWF *i* on all its affiliates in country *j*, and the denominator is the sum of the cash flow rights for all of SWF *i*'s affiliates in all countries. Therefore, CF_{ij} measures the percentage of cash flow rights a given SWF allocates in each country it invests.

Explanatory (distance) variables

To measure *cultural* distance, we use the four dimensions of Hofstede (1980), namely: a) power distance, which is the degree to which the less powerful members of a society accept and expect that power is distributed unequally; b) individualism, referring to the degree of independence among members of a society (that is, to what extent members rely on each other, also referred as "I" versus "we"); c) masculinity, that is the extent to which success is defined as being the best (masculinity) or having a good quality of life (femininity); and, d) uncertainty avoidance, defined as the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. Then we aggregate them into a single index, following (Kogut and Singh, 1988), where

cultural distance *CD* is estimated as $CD = \sum_{d=1}^{4} \frac{(I_d^i - I_d^j)^2}{4\sigma_d^2}$, where I_d the Hofstede dimensions, σ_d^2 the variance of each of the dimensions, I^i the origin country and $I^j$the target country. Unfortunately, not all countries in the sample have their Hofstede dimensions available, thus reducing the sample size when we use cultural distance as variable of interest. Out of the original 205 countries, only 101 have Hofstede dimensions available.

As is usual in the economics and finance literatures (Anderson, 1979; Anderson and van Wincoop, 2004; Bergstrand, 1985), we collect data on the geographical coordinates of countries to measure *geographical* distance. This variable is set as the radius—in kilometers—of the great circle between any pair of countries.

We measure *institutional* distance, in turn, using an aggregated measure of the Worldwide Governance Index (WGI) (Kaufmann, Kraay, and Mastruzzi, 2010). The World Bank provides six dimensions of governance for each country, namely voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. Each country is assigned a score for all six dimensions. We sum those scores and calculate the percentile associated with each country. We thus define institutional distance as the quadratic difference of the target and origin countries percentile.

Finally, *religious* distance is measured as the inverse of the percentage of population that shares the same religion (CR). We collected data at the Association of Religion Data Archives (ARDA) on the percentage of population that follows certain religions in each country. We then operationalize religious distance as the inverse of CR, as a higher CR represents higher proximity. In order to calculate this percentage we use the same approach as Melitz and Toubal, (2014):

$CR_{ij} = \sum_{r=1}^{18} Min(P_r^i, P_r^j)$, where P_r^i is the percentage of population following one of the eighteen different religions in country *i*, and P_r^j is the same thing for country *j*.

Control variables

In addition to the main explanatory variables, we use a set of control variables to capture some characteristics of the funds and of the origin and target countries. We control for GDP per capita of the target and origin countries—as those are also important factors in gravity models from the economics literature (Anderson, 1979; Anderson and van Wincoop, 2004; Bergstrand, 1985). We also control for important characteristics of the SWFs, namely age, AUM (assets under management, a proxy for size), origin of its resources (measured as a dummy variable that indicates whether resources come from revenue of commodities sales or not) and region (to control for differences in terms of regional geopolitics).

1.4.3 Estimation Method

In order to empirically assess the effects of distances in the likelihood of a SWF in country *i* investing in companies in country *j*, we use a Logit model with clustered standard errors to account for the correlation of a SWF from one country investing in several countries. The Logit model forces the result of a linear regression to be contained inside a range of zero to one through the function $\Lambda(z) = \frac{e^z}{(1+e^z)}$, and thus return the probability of an event happening (Wooldridge, 2010).

We then assess the effects of distances in the amount a SWF in country *i* invests in companies in country *j*, relative to the overall investments of the fund. For that, we use a Tobit model—also with clustered standard errors—to correct for the possible selection problem of the SWF deciding to invest anything in country *j* in the first place. This may be the case as the internationalization

decision of the firm can be thought of as sequential, where the first step is choosing where to invest (location choice) and in a second step choosing how much to invest (Beugelsdijk et al. 2018).

Given the way the independent variables were constructed, higher values of these variables represent larger distances between countries *i* and *j*. Thus, we expect that all the coefficients associated with the distance variables will be negative, meaning that a greater distance between any two countries decreases the probability or amount that a SWF from country *i* will invest in country *j*.

1.5 Findings: The Effect of Distances on Direct and Indirect Investments

1.5.1 Main Findings

In Table 3 we study how our different distance measures impact the decision to invest in firms directly using our Logit specifications and using a binary measure as dependent variable. We have five specifications for both direct and indirect investments of SWFs. In each specification, we introduce each distance variable– with all the control variables – one at a time to show the effect of each type of distance on the likelihood of having a SWF invest in each of the target countries. In the fifth specification (Specifications 5 and 10) we introduce all distance variables in the same specification and the results tend to hold (with some of the coefficients losing some statistical significance). All the specifications used clustered standard errors at the fund level to account for correlation arising from the fact that there is one SWF investing in multiple countries.

Overall, our results are consistent with previous studies such as Knill *et al.* (2012a) and Chhaochharia and Laeven (2008), who find significant effects for political and cultural distances, respectively. A computation of marginal effects at the average value of all other variables (Williams, 2012) gives us a sense of the magnitude of the effects of distances on the likelihood of

investment in a given country. An increase of one standard deviation in cultural distance, geographical distance and religious distance, reduce, on average, the likelihood of direct investment by 3.28, 3.50, and 2.68 percentage points ($p < 0.01$; the full report of the marginal effects is not included here, but available upon request), respectively. When we include all distances in the same specification, the increase of one standard deviation reduces the likelihood of direct investment by 1.52 ($p < 0.05$) for cultural distance, 4.89 ($p < 0.01$) for geographical distance, and 2.09 ($p < 0.01$) for religious distance.

Our more detailed analysis of pyramidal effects allows us to unveil novel conclusions of how distances affect not only direct investments, but the indirect investment behavior of SWFs. We then repeat the exercise with the indirect investments in the right section of Table 3. Interestingly, all the coefficients for the distance variables are either insignificant or have a smaller coefficient than what we found for direct investments. When considering indirect investments, cultural distance no longer affects significantly the likelihood of investment. An increase of one standard deviation in geographical distance and religious distances reduces, on average, the likelihood of indirect investment by 8.31 and 5.29 percentage points ($p < 0.01$), respectively. When we include all distances in the same specification, the increase of one standard deviation reduces the likelihood of indirect investment by 7.01 ($p < 0.05$) for geographical distance, and 6.71 ($p < 0.01$) for religious distance.

Because we are using a Logit specification with different dependent variables (direct vs. indirect investments), we cannot simply compare the coefficients of the right and left sides of Table 3 and argue that they are statistically smaller for indirect investments. We thus implement a statistical procedure to test whether the coefficients of the indirect investment regressions are significantly different from those for the estimates for direct investments. We follow Clogg, Petkova, and

Haritou (1995) and use the simplified version of the so-called Z-score to compare the coefficients in both estimates (we include this test in the last column of Table 3). Simply put, the score allows for a statistical test of comparison of the coefficients estimated by the regressions where we consider direct and indirect investments. We find that the coefficients for indirect investment estimates are either not statistically significant or significantly lower than for direct investments. That is, in this simple analysis simply observing the binary decision of *where* to invest, it appears that indirect investments are generally less sensitive to distance than direct investments.

In Table 4 we use our alternative measure considering the size of the investment per country (i.e., the relative cash flow claim per country over total cash flow claims) as a dependent variable. The findings are consistent with what we show in Table 3, where all distance variables (except institutional distance) are significant and negatively affect our dependent variable. Thus, the increase of one standard deviation in cultural distance, for instance, diminishes the relative allocation of investments in a given target country by 1.09 percentage points.

Yet an interesting difference arises: when we include indirect investments in the sample (right panel of the Table), our Z-scores reveal that the coefficients for the distance variables are not statistically different from the coefficients in the direct investments sample (left panel of the Table). This means that SWFs take into account distances in the same way when they choose the relative size of both direct and indirect investments in a given country. This finding is consistent with our conjecture, discussed before, that *large* indirect investments may be seen as critically important for SWF managers, even if they are several layers down the ownership pyramid and thus may be as sensitive to distance as direct investments. In other words, indirect stakes may not necessarily reduce managerial attention, and hence attenuate the effect of distances, when they are highly important in the overall portfolio of the SWFs.

1.5.2 Additional Analyses and Robustness Checks

We conducted the same analysis with a more comprehensive set of distance variables, following Ghemawat (2001) and the refinement proposed by Berry *et al.* (2010), in which the administrative and political distance is separated into several variables capturing both administrative and political distance. In this alternative analysis, we included, in addition to the variables in the main results, GDP, inflation, and total trade distances to account for economic distance, and freedom scores and government expenditure as a percentage of GDP distances to account for political distance. We also included dummy variables to indicate contiguousness between countries, membership in a same trade bloc, common spoken language, colonial ties, existence of a common colonizer, common legal systems, and if two countries were ever the same at some point. The results using these alternative distance variables hold, both using location and the proxy for relative size of the investment as dependent variables. These distances similarly affect indirect investments less than direct investments when we study location as dependent variable, but that difference also disappears when we use the measure of relative investment size as dependent variable.

Additionally, we conducted a robustness check allowing for the possibility of selection bias in our sample. Selection bias could arise from the fact that the origin countries self-select to have SWFs in the first place. Hence, we follow Hamilton and Nickerson (2003) and run a Heckman two-stage estimation (Heckman, 1979) in which the first stage predicts the probability of a country having a SWF. As instruments, we use the ratio of total trade (imports + exports) over GDP, and oil rents over GDP for each country. We use these variables as instruments because the vast majority of SWFs are either funded through revenues originated from commodities—usually oil—or through surpluses in the balance of trade. Thus, countries with a higher proportion of trade or oil rents over GDP are more likely to have a SWF, which satisfies the relevance requirement of an instrumental

variable. It is also very unlikely that these variables have a direct influence over the relative size of the SWF's investment in each target country, satisfying the exclusion restriction as well. We then include the inverted Mill's ratio in the second stage, which predicts the relative cash flow allocations of SWFs in each country. We find that the inverse of the Mill's ratio is not statistically significant, neither for direct nor indirect investments, indicating that our results are not potentially influenced by a selection bias.

Finally, we consider the possibility that distances might have an asymmetric effect (Hernández and Nieto, 2015), depending on, for instance, if the home country is more institutionally developed than the target country. The only variable in our set of distances where there could be asymmetries between home and target countries is institutional distance. Yet, we do not find that the asymmetry variable alters the result in any significant way. We test this in the following way. We coded a dummy for asymmetric distance if the target country has a higher value of the aggregated WGI institutions index than the home country (i.e., the target country has better institutions). We then interact this dummy with the institutional distance variable. Then we run this regression (using size of investment as dependent variable) and we find that the coefficient of the interaction is not significant for direct or indirect investments alike.

1.5.3 Examining the role of heterogeneous SWFs traits

Given that, as per our previous analyses, distances appear to affect both direct and indirect stakes in a similar way once we consider the relative importance of the investment in the overall portfolio of a given fund, we now perform an additional exploratory analysis by examining if heterogeneous traits *at the fund level* affect the link between distances and size-adjusted investments (i.e. the percentage of portfolio that involves a given country, considering *both* direct and indirect stakes).

The idea behind this test is that SWFs have different characteristics that lead them to choose the kind of investments they make and how much they want to invest in each country.

We start by examining how funds vary in their overall *strategic orientation* (Aguilera *et al.*, 2016; Bernstein *et al.*, 2013; Johan, Knill, and Mauck, 2013; Knill *et al.*, 2012). We classify SWFs by strategic orientation using the categories of Aguilera *et al.*, dividing them into: a) *active investors* (e.g., the Norway Global Pension Fund), which are SWFs that actually acquire positions and do activism to improve governance, environmental policy, and the social objectives of the target firms); b) *financial SWFs*, which are return-seeking funds that have sophisticated in-house capabilities to manage equity portfolios, but rely also on private equity and other investment vehicles (such as GIC of Singapore, Kazanah in Malaysia, or ADIA and ADIC in Abu Dhabi); c) *legitimacy seekers* (such as CIC in China, Temasek in Singapore, or Kuwait Investment Authority), which are funds that do investments in public and private markets in ways that allow their home governments to gain legitimacy in the international community, such as helping the US government to capitalize some of the largest commercial and investment banks during the Global Financial Crisis in 2007-2009); d) *long-term learning focused SWFs*, i.e., funds that make investments abroad to learn or to obtain valuable technologies (such as Mubadala). We also add *reserve management funds* as a fifth strategic orientation category, because they do not fit properly into any of Aguilera *et al.*'s classifications. These are funds that manage reserves and are usually focused on capital preservation but often also on diversifying their returns away from the core industries of the home economy (such as Saudi Arabia's Monetary Authority, SAFE in China or the Hong Kong Monetary Authority).

Furthermore, we examine how SWFs vary according to the *leadership composition* of their management teams. Following Bernstein *et al.* (2013), we code funds as *politicians* if political

actors are in key managerial or board positions, and *external managers* if those funds have outside directors on their boards. These differences may influence SWFs' investment strategy because of the different underlying goals these two types of managers might have. For example, politicians may be trying to advance diplomatic goals, while external managers may focus on maximizing returns. Table 5 shows the final classification of our funds in these dimensions.

Given these varied definitions, it is difficult to generalize how fund-level traits will moderate distance for direct and indirect investments. Thus, we take an agnostic, exploratory approach and let the data tell us whether these relations exist and in what direction they moderate distances. For this purpose, we interact each of the dummies for fund type with each our distance variables. Instead of displaying all the regression coefficients showing the interactions with our SWF types, we include a simplified depiction of the results in Table 6 in which we only present the sign and significance level of the interactive effect (the moderating effect) if such effect was statistically significant. In line of our previous finding, we center our analysis on how these traits influence location decisions adjusting for the relevance of the investment. In other words, here we assess whether different results emerge when we consider heterogeneous fund-level characteristics.

Our exploratory analysis indicates that some strategic orientations and leadership compositions may moderate the effect of distances, but these patterns are not consistent across all distinct distance variables. For instance, SWFs that act as active investors—which in our sample corresponds only to Norway's Global Pension Fund, moderate *down* the effect of cultural and geographical distances but not the other two distance measures. That is, active investor funds are more likely to have larger investments (measured using relative higher cash flow claims) in countries that are more distant. It could be the case that, since they are in the business of improving corporate governance, they could end up investing proportionately more in culturally distant

countries to change the corporate governance of companies in those distant locations with activism.

The second pattern we find is that financial SWFs are more sensitive to religious distance. Because religious traditions influence so many aspects of life and interpersonal relations, countries that are religiously more distant may be associated with larger asymmetries of information. Thus, increasing the exposure of the SWF to countries with different religions may significantly increase the overall risk of the portfolio. Yet, again, this pattern does not hold for all distance measures.

Third, SWFs focused on long-term learning also display lower sensitivity to the effects of cultural and geographical distances, both on direct and indirect investments. That is, their learning objective seems to be prioritized, allowing them to take on more of the risk that distance entails.

Lastly, funds with external managers in their boards seem to be more affected by geographical distance. A possibility is that funds with a larger proportion of external managers may have less of the diplomatic leverage that politician-led funds have, thus making them more sensitive to the costs of distances and the risks they entail.

Beyond these results, we do not find any other consistent relation between fund-level traits and distances across specifications. These inconsistent results may be a product of opposite forces driving the moderating effect of fund characteristics on distances. For instance, one could expect more risk averse funds, like those more focused on capital preservation such as reserve management funds, should enhance the effect of distance. That is, they should be perhaps be more conservative in their investment approach; consequently, distances should be more negatively correlated with the relative amount in the target countries. On the other hand, some of these funds that manage reserves also have the mandate to diversify away from the activities of the home

country, which may lead them to invest in remote locations or in countries with completely different economic structures than their home country, thus moderating down the effect of distance.

SWFs focused on advancing legitimacy of their governments also have conflicting motivations that could influence their moderating effect on distance. On the one hand, the objective of gaining legitimacy for their home government or for the fund itself may drive them to make investments that bridge the cost of distance. On the other hand, one of the key legitimacy objectives could be to be to make investments that help SWFs or their home governments to be perceived as good partners in neighboring countries, thus accentuating the effect of distance.

In summary, our analysis shows that there is some relevant heterogeneity in SWFs' traits, and this difference may influence the way they behave. However, the moderating effect of these distinct traits on the role of distances in their foreign investment strategies is not consistent across different measures of distance. For instance, funds with politicians on the board (weakly) moderate down the effect of institutional distance for direct investments, but enhance the effect of religious distance for indirect investments. We thus conclude that, although relevant to explain the general behavior and orientation of SWFs, fund-level traits do not appear to be relevant factors that consistently influence the link between distances and investment location decisions.

1.6 Discussion: Implications of our Findings and Future Directions

In this paper, we examine how distances affect the international investment decisions of SWFs for both direct and indirect investments. We first analyze how distances affect the location choices of these funds, using a binary variable that indicates the presence of any investment of the SWF in the target country. Our findings confirm what most of the existing literature on the effect of distances over FDI has found, which is that distances do matter for location choices. We go one

step further and compare the effect that distances have on the location choices of direct versus indirect investments. We find that distances, at first glance, are less important for indirect than for direct investments, consistent with view that subsidiaries have more autonomy once they are further away from the parent company and/or that these indirect investments reduce cash flow rights. These factors may arguably reduce managerial attention to indirect investments in long pyramid chains (Belenzon *et al.*, 2019a; Beugelsdijk and Jindra, 2018; Fan *et al.*, 2013), potentially attenuating the effect of distances.

However, managerial attention should also depend on the relative importance of an investment in the overall portfolio. We thus investigate the relative role of distances for direct and indirect investments after accounting for the relative size of the investment. Our conjecture is that managerial attention tends to increase when investments are relevant in the overall portfolio of the fund. We proxy the size of investments as the percentage of cash flow rights a given SWF allocates in each country it invests relative to the sum of cash flow rights from all countries. Our new analysis is consistent with our prior finding that distances do (negatively) matter. Nonetheless, we also confirm that distances matter *as much* for indirect investments as they do for direct investments once we account for the size of those investments.

Our findings suggest that the decisions of *where* to invest and *how much* to invest are not necessarily the same. This result is consistent with those of Knill et al. (2012), who find that political relations between countries are important to determine where they invest, but not how much they invest. These are distinct decisions that should both be taken into account when examining factors influencing the behavior of SWFs and other organizations as they implement their international expansion strategies. Namely, our results suggest that SWFs appear to be more intrinsically involved in the decisions regarding large indirect investments.

Our results also contribute to the literature on FDI and multinational strategies more generally. Most of the literature on the role of distances on the international expansion of multinationals focus on direct stakes or direct subsidiaries (Beugelsdijk *et al.*, 2018; Chhaochharia and Laeven, 2008; Johan *et al.*, 2013; Kogut and Singh, 1988; Kostova and Zaheer, 1999). In contrast, our study suggests that, first, the presence of (large) indirect investments is ubiquitous, and second, that managers may also take into consideration investment decisions involving indirect stakes—as much as they do for direct stakes—in complex ownership pyramids.

Moreover, our findings suggest that it is of the utmost importance to consider the relative importance of investments, especially when examining the role of indirect stakes, as they may crucially affect managerial attention and hence the effect of distances or any other relevant factor influencing international expansion strategies. This is particularly important because, even if there is a small literature that tries to look at the extent of investments of multinationals in foreign countries, the scale of investments is rarely measured in terms of the absolute amount of capital employed by MNEs when investing in a certain host country (Beugelsdijk, et al. 2018; p. 106). Most studies proxy for the size of the investment using the degree of ownership. Thus, we contribute to the literature by both developing a more rigorous measure to account for the capital commitment of SWFs in foreign countries, which includes not only the ownership stakes, but also a proxy for the size of the investees, and by showing that, once we use this new measure, the effect of distances on indirect investments is *as important as* for direct investments.

Our paper speaks also to the literature on organizational attention and distance between headquarters and their subsidiaries. In this literature, the further a subsidiary and its subsidiaries are from the headquarters (in terms of subsidiary levels), the more autonomy they have and, theoretically, the less attention they receive from the headquarters as well (Belenzon *et al.*, 2019a;

Fan *et al.*, 2013). We believe our data and findings show that studies of the structural dimensions of organizational control need to include the relative importance or size of each of the investments and not only the relative distance to the headquarters via the number of intermediary subsidiaries or via the percentage of ownership (as it is common in studies of pyramids). A subsidiary that is far away from the headquarters within a pyramidal ownership structure (e.g., say it is the subsidiary of a subsidiary that is three levels down) may still be important for the headquarters if the investment in that subsidiary is relatively large, increasing the extent of cash flow the headquarters receive from such an investment.

Future work on the international expansion of SWFs should therefore not only pay attention to *both* direct and indirect stakes, but also examine the relative importance of these investments for managers and other relevant decision makers.

Lastly, we provide further evidence that there is relevant heterogeneity in SWF strategies, yet our exploratory analysis suggests that not all traits have a significant moderating effect on distances, and the ones that do affect distances do not exhibit a consistent effect across all types of distances. These findings are relevant because the literature has conflicting views on how distinct traits of SWFs may affect their investment decisions. Take for instance the role of politicians in SWFs. It is easy to see why SWFs that are managed by politicians or members of the royal family appear as if they could lever the backing of the government to bridge distance when they choose their investments. However, our empirical findings point to a different direction as we find that SWFs in which politicians have more seats as directors or in executive positions have no consistent moderating effect influencing the link between distances and investment decisions.

Our results also suggest potential avenues of future research. At a more fundamental level, we need to improve our understanding of how SWFs structure pyramids in their host countries.

Several heterogeneous factors could be examined. How do SWFs mix the companies in which they have control with companies in which they only have cash flow rights? Is there variation in the way those pyramids are structured across funds? Once we use the entire pyramids of investments of SWFs, how diversified are these funds? How does their diversification compare to those of mutual or pension funds? What do we learn about the portfolio investments of SWFs when we consider the entire span of investments? How do the different types of SWFs vary in their approaches to investing abroad? Do financial funds use pyramids in a different way than those with learning objectives?

Finally, if we think of SWFs as managers of complex ownership pyramids, how do they compare to multinational organizations creating large business groups spanning several countries? Such line of investigation would require collecting data on the internal expansion of various types of firms and SWFs, whose international expansion patterns can be jointly assessed and compared. For instance, does the effect of distances on direct and indirect stakes differ between SWFs, private institutional investors and multinational companies? Along these lines, another extension would come from collecting detailed data on the various sorts of alternative assets that SWFs invest in each country and with distinct types of organizational partners. Arguably, SWFs may mix distinct types of investments with varied risk profiles and alternative organizational arrangements, and this more encompassing portfolio management strategy may influence the perceived hazards from increased distances or other relevant cross-national factors.

1.7 Tables and Figures

Table 1.1 - SWFs in the sample, with descriptive statistics of direct and indirect investments

					Direct Investments - *All deals*			Indirect Investments - *All deals*			Direct Investments - *Majority inv. only*			Indirect Investments - *Majority inv. only*		
Country	SWF name	AUM as of 2014 ($Billions)	Year est.	Origin	Number of deals	% of total deals	# of countries	Number of deals	% of total deals	# of countries	Number of deals	% of total deals	# of countries	Number of deals	% of total deals	# of countries
UAE	Abu Dhabi Investment Authority	$773	1976	Oil	36	3.3	15	1,724	0.6	62	7	2.2	5	108	5.4	18
UAE	Abu Dhabi Investment Council	$110	2007	Oil	14	1.3	2	589	0.2	53	5	1.6	1	134	6.7	24
US - Alaska	Alaska Permanent Fund	$53,9	1976	Oil	5	0.5	3	24	0.0	4	1	0.3	1	1	0.0	1
Bahrain	Mumtalakat Holding Company	$10,5	2006	Non-Commodity	32	2.9	9	493	0.2	57	13	4.2	2	28	1.4	2
Brunei Darussalam	Brunei Investment Agency	$40	1983	Oil	3	0.3	3	17	0.0	5	3	1.0	3	15	0.7	5
China	China Investment Corporation	$746,7	2007	Non-Commodity	22	2.0	8	40,652	15.1	178	5	1.6	2	125	6.2	20
UAE	Emirates Investment Authority	$15	2007	Oil	13	1.2	8	6,207	2.3	161	1	0.3	1	22	1.1	10
Singapore	Gov't of Singapore Investment Corp.	$344	1981	Non-Commodity	96	8.8	25	39,696	14.7	170	4	1.3	3	11	0.5	4

China - Hong Kong	Hong Kong Monetary Authority	$400,2	1993	Non-Commodity	10	0.9	1	12	0.0	2	10	3.2	1	12	0.6	2
UAE	International Petroleum Investment Co.	$66,3	1984	Oil	19	1.7	12	39,804	14.7	170	10	3.2	7	175	8.7	36
UAE	Investment Corporation of Dubai	$183	2006	Oil	42	3.8	4	1,118	0.4	85	22	7.0	2	193	9.6	24
Kazakhstan	Samruk-Kazyna JSC	$77,5	2008	Non-Commodity	35	3.2	2	987	0.4	22	25	8.0	1	80	4.0	5
Malaysia	Khazanah Nasional Behard	$41,6	1993	Non-Commodity	123	11.2	12	8,693	3.2	117	100	31.9	6	364	18.1	17
Kuwait	Kuwait Investment Authority	$592	1953	Oil	23	2.1	12	6,408	2.4	126	4	1.3	3	12	0.6	7
Libya	Libyan Investment Authority	$66	2006	Oil	7	0.6	5	7	0.0	5	2	0.6	2	2	0.1	2
UAE	Mubadala Development Company	$66,3	2002	Oil	45	4.1	11	727	0.3	42	33	10.5	9	75	3.7	13
New Zealand	New Zealand Superannuation Fund	$21,8	2003	Non-Commodity	23	2.1	23	149	0.1	9	-	-	-	-	-	-
Norway	Government Pension Fund	$882	1990	Oil	352	32.1	29	43,081	16.0	170	4	1.3	1	8	0.4	1
Qatar	Qatar Invest-	$256	2005	Oil & Gas	51	4.7	17	39,612	14.7	189	11	3.5	3	83	4.1	15

	ment Authority																
Saudi Arabia	Saudi Arabian Monetary Agency	$671,8	1952	Oil	12	1.1	4	88	0.0	11	-	-	-	-	-	-
China	FH State Adminis-tration of Foreign Exch.	$547	1997	Non-Commodity	2	0.2	1	31	0.0	4	1	0.3	1	2	0.1	2
Oman	State General Reserve Fund	$13	1980	Oil & Gas	9	0.8	6	550	0.2	42	3	1.0	3	3	0.1	3
Singa-pore	Temasek Holdings	$193,6	1974	Non-Commodity	122	11.1	21	39,402	14.6	164	49	15.7	13	560	27.8	36
Total					1,096	100.00	66	270,071	100.00	205	313	100.00	37	2,013	100.00	83

Table 1.2 - Variable definitions

Variable name	Description	Source
Dependent variables		
Location choice	Dummy variable which equals 1 if there is at least one investment in the dyad SWF *i* - country *j* and 0 otherwise	BVD's Orbis
Portfolio allocation	Sum of SWF *i*'s investments in country *j* relative to SWF *i'*s investments in all other countries - see data section for details	BVD's Orbis
Independent variables		
Cultural distance	See data section	Hofstede Centre
Geographical distance	Radius of the great circle between countries i and j	CIA Factbook
Religious distance	See data section	ARDA
Institutional distance	See data section	Worldwide Governance Indicators
Controls		
SWF age	Years since establishment (until 2014)	SWF Institute
Assets under management	Assets under management for each SWF, in billions of US Dollars	SWF Institute
Region	Set of dummy variables (North America, East Asia and Pacific, Europe and Central Asia, Middle East) which equal 1 if the SWF is located in the corresponding region	SWF Institute
Origin of resources	Dummy variable which equals 1 if the SWF's resources come from revenues of natural resources, 0 otherwise	SWF Institute
GDP origin	Log of origin country i's GDP	World Development Indicators
GDP target	Log of target country j's GDP	World Development Indicators

Table 1.3 - Location choices for direct and indirect investments: the dependent variables codes the presence or not of investment in a SWF-country dyad.

VARIABLES	(1) Logit Direct Inv. Culture	(2) Logit Direct Inv. Geographic	(3) Logit Direct Inv. Institutions	(4) Logit Direct Inv. Religious	(5) Logit Direct Inv. All distances	(6) Logit Indirect Inv. Culture	(7) Logit Indirect Inv. Geographic	(8) Logit Indirect Inv. Institutions	(9) Logit Indirect Inv. Religious	(10) Logit Indirect Inv. All distances	Z-test Individual constructs	Z-test All distances
Cultural dist.	-0.282***				-0.140**	0.0261				0.069	-2.56***	-1.94**
	[0.0786]				[0.0622]	[0.0908]				[0.0877]		
Geographic dist.		-1.95e-04***			-1.76e-04***		-9.19e-05***			-7.82e-05**	-2.74***	-1.76**
		[2.66e-05]			[4.33e-05]		[2.66e-05]			[3.45e-05]		
Institutional dist.			-0.819		-0.003			-0.457		-0.846	-0.44	0.906
			[0.632]		[0.684]			[0.500]		[0.630]		
Religious dist.				-0.187***	-0.097***				-0.057***	-0.074***	-2.29**	-0.50
				[0.0533]	[0.0371]				[0.0193]	[0.0275]		
Controls:												
SWF controls: age, AUM, region, origin of resources	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
GDP of target and origin countries	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Observations	1,632	3,696	3,633	3,675	1,615	1,632	3,696	3,633	3,675	1,615		
Pseudo R^2	0.172	0.222	0.170	0.201	0.241	0.120	0.135	0.116	0.128	0.171		

Note: The Z-test compares the coefficients of regressions with direct and indirect investments as dependent variables. Dependent variable is binary and indicates whether a SWF has at least one investment in a given country. All regressions include controls for SWF characteristics such as age, AUM, region and our coding for origin of resources (see Table 1). We also control for log GDP of both target and origin countries. Significance denotes as *** for p<0.01, ** for p<0.05, and * for p<0.1. Standard errors were clustered at the SWF level.

Table 1.4 - Location choices for direct and indirect investments adjusting for the relevant of the investments: the dependent variables is a proxy for size of investment using the relative cash flow claims by country (relative to all cash flow claims by SWF).

VARIABLES	(1) Tobit Direct Inv. Culture	(2) Tobit Direct Inv. Geographic	(3) Tobit Direct Inv. Institutions	(4) Tobit Direct Inv. Religious	(5) Tobit Direct Inv. All distances	(6) Tobit Indirect Inv. Culture	(7) Tobit Indirect Inv. Geogra-phic	(8) Tobit Indirect Inv. Institu-tions	(9) Tobit Indirect Inv. Religious	(10) Tobit Indirect Inv. All distances	Z-test Indivi-dual cons-tructs	Z-test All distan-ces
Cultural dist.	-0.006***				-0.005***	-0.005***				-0.005***	-0.25	-0.24
	[0.00127]				[0.00119]	[0.00141]				[0.00139]		
Geographic dist.		-1.15e-06***			-1.78e-06***		-1.18e-06***			-1.78e-06***	0.070	0
		[3.02e-07]			[6.17e-07]		[3.02e-07]			[6.37e-07]		
Institutional dist.			-0.004		-2.63e-04			-0.002		0.005	-0.68	-0.72
			[0.00251]		[0.00315]			[0.00249]		[0.00631]		
Religious dist.				-1.47e-04**	-2.78e-05				-2.29e-04***	-2.93e-04	0.765	1.011
				[7.45e-05]	[0.000167]				[7.70e-05]	[0.000202]		
Controls: SWF controls: age, AUM, region, origin of resources	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
GDP of target and origin countries	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Observa-tions	1,441	3,149	3,089	3,132	1,424	1,441	3,149	3,089	3,132	1,424		

Note: The Z-test compares the coefficients of regressions with direct and indirect investments as dependent variables. Dependent variable is a proxy for size of investment using the relative cash flow claims by country (relative to all cash flow claims by SWF). All regressions include controls for SWF characteristics such as age, AUM, region and our coding for origin of resources (see Table 1). We also control for log GDP of both target and origin countries. Significance denotes as *** for p<0.01, ** for p<0.05, and * for p<0.1. Standard errors were clustered at the SWF level.

Table 1.5 - Classification of funds in our sample, following Aguilera et al. (2016) and Bernstein et al. (2013)

Country	SWF name	Strategic Orientation	Politicians	External managers
UAE	Abu Dhabi Investment Authority	Financial SWF	YES	YES
UAE	Abu Dhabi Investment Council	Financial SWF	YES	NO
US - Alaska	Alaska Permanent Fund	Reserve management	YES	YES
Bahrain	Mumtalakat Holding Company	Legitimacy seeking	NO	YES
Brunei Darussalam	Brunei Investment Agency	Reserve management	YES	YES
China	China Investment Corporation	Legitimacy seeking	YES	NO
UAE	Emirates Investment Authority	Legitimacy seeking	YES	YES
Singapore	Gov't of Singapore Investment Corp.	Financial SWF	YES	YES
China - Hong Kong	Hong Kong Monetary Authority	Reserve management	YES	NO
UAE	International Petroleum Investment Co.	Long-term learning	YES	YES
UAE	Investment Corporation of Dubai	Legitimacy seeking	YES	NO
Kazakhstan	Samruk-Kazyna JSC	Legitimacy seeking	YES	YES
Malaysia	Khazanah Nasional Behard	Financial SWF	YES	YES
Kuwait	Kuwait Investment Authority	Legitimacy seeking	YES	NO
Libya	Libyan Investment Authority	Legitimacy seeking	YES	YES
UAE	Mubadala Development Company	Long-term learning	YES	YES
New Zealand	New Zealand Superannuation Fund	Reserve management	NO	YES
Norway	Government Pension Fund	Active investor	YES	YES
Qatar	Qatar Investment Authority	Legitimacy seeking	YES	YES
Saudi Arabia	Saudi Arabian Monetary Agency FH	Reserve management	NO	YES
China	State Administration of Foreign Exch.	Reserve management	YES	YES
Oman	State General Reserve Fund	Reserve management	NO	YES
Singapore	Temasek Holdings	Legitimacy seeking	YES	YES

Table 1.6 - Tests of the moderating effects of SWFs characteristics for direct and indirect investments, adjusting for the size of the stakes

Panel A: Direct investments

		Following Aguilera et al., 2016					Following Bernstein et al., 2013	
Distance	Method	Active Inv.	Financial SWF	Reserve management	Legitimacy seeking	LT learning	Politicians	External managers
Cultural dist.	OLS	**(+) *** **		**(-) ** **		**(+) ** **		
	Tobit	**(+) *** **		**(-) ** **		**(+) *** **		
Geographic dist.	OLS	**(+) * **				**(+) ** **		**(-) * **
	Tobit	**(+) ** **				**(+) ** **		**(-) ** **
Religious dist.	OLS		**(-) *** **					
	Tobit		**(-) *** **					
Institutional dist.	OLS	**(-) * **		**(-) * **			**(+) * **	**(-) ** **
	Tobit	**(-) * **		**(-) * **			**(+) * **	

Panel B: Direct and indirect investments

Distance	Method	Active Inv.	Financial SWF	Reserve management	Legitimacy seeking	LT learning	Politicians	External managers
Cultural dist.	OLS	**(+) *** **				**(+) *** **		**(-) ** **
	Tobit	**(+) *** **				**(+) *** **		**(-) *** **
Geographic dist.	OLS	**(+) *** **				**(+) ** **		**(-) ** **
	Tobit	**(+) ** **				**(+) ** **		**(-) ** **
Religious dist.	OLS		**(-) *** **	**(+) * **			**(-) ** **	
	Tobit		**(-) *** **	**(+) * **			**(-) ** **	
Institutional dist.	OLS		**(+) * **					
	Tobit	**(-) * **	**(+) * **					

Notes: Dependent variable is a proxy for size of investment using the relative cash flow claims by country (relative to all cash flow claims by SWF). All regressions include controls for SWF characteristics such as age, AUM, region and our coding for origin of resources (see Table 1). We also control for log GDP of both target and origin countries, and we include the distance variables one by one and interact them with each of the SWF types (thus we include a dummy for each fund type as well). The table shows the sign and significance level for the interacted coefficients of the strategic orientation variables with each distance variable, only when those interactions were statistically significant. Significance denotes as *** for $p<0.01$, ** for $p<0.05$, and * for $p<0.1$. Standard errors were clustered at the SWF level.

CHAPTER 2

Ownership Design and Managerial Efficiency

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2.1 Introduction

Ownership structures that enable an ultimate owner, traditionally families and governments (La Porta, Lopez-De-Silanes, and Shleifer, 1999), to have indirect control over subsidiaries have interested financial economists for decades (e.g., Almeida and Wolfenzon, 2006b; Tricker, 1984; Wolfenzon, 1998). The predominant view has been that these structures allow ultimate owners to control a large number of firms while holding their investment fixed—that is, they create a separation between cash-flow and voting rights (Berle and Means, 1932; Bertrand and Mullainathan, 2003; Claessens, Djankov, and Lang, 2000). These 'control enhancing' structures are called pyramids and are linked to several governance problems, such as tunneling (Baek, Kang, and Lee, 2006; Bertrand, Mehta, and Mullainathan, 2002; Johnson *et al.*, 2000), incentive misalignment (Bebchuk, Kraakman, and Triantis, 2000; Bebchuk and Roe, 1999; Perkins, Morck, and Yeung, 2014), and socio-economic distortions that allow elites to expand their economic and political power (Dyck and Zingales, 2004; Morck, Wolfenzon, and Yeung, 2005).

We construct a novel dataset comprised of almost 4 million companies spanning 211 countries to test this idea. For each parent company, we follow the 'ownership paths' connecting the parent firm to its last controlled subsidiaries, resulting in approximately 2.9 million observations from

approximately 1.17 million parent companies. This disaggregated data allows us to investigate the determinants of ownership structures both within and across firms.

Contrary to the widely held belief that pyramidal structures are a mechanism of separation between voting and cash-flow rights, we find that the divergence between control and residual rights is quite rare, in line with the recent findings of Belenzon, Hashai, and Patacconi (2019) for Western European firms. We show that 77% of pyramidal paths have an insignificant ownership gap (the difference between cash flow and voting rights) of less than one percent, and 87% of them are below the 10% threshold. This is true across industries and groups of countries, such as OECD members and non-members, and countries where business groups are prevalent or not (Granovetter, 1995; Guillén, 2000).

Despite recent challenges to the validity of the traditional view on pyramids (e.g., Belenzon *et al.*, 2019; Franks and Mayer, 2001), the *status quo* of the financial economics literature remains unchanged. We attribute the inability of such studies to alter the longstanding, predominant view that pyramidal structures serve mainly as a mechanism of expropriation and exertion of private benefits of control to: (i) the difficulty of gathering large-scale, systematic evidence that indicates otherwise; (ii) the lack of a convincing alternative theory that explains a large share of the variance in the architecture of ownership structures. We fill these gaps by investigating ownership structures on a global scale and by providing (and testing) an alternative explanation to the phenomenon of pyramidal ownership as analogous to divisional hierarchies within firms (e.g., Chandler, 1962; Galan and Sanchez-Bueno, 2009; Hall and Saias, 1980; Miller, 1986). We argue that pyramidal ownership structures allow firms to manage diversification in their portfolios (Bethel and Liebeskind, 1998), and claim that pyramidal structures are particularly useful when engaging in unrelated diversification.

Our findings are consistent with the idea that pyramidal structures are mostly used to manage diversification. More than 85% of pyramidal paths have some degree of industry difference between the parent and last subsidiary. The more unrelated a subsidiary to its parent, the more intermediary companies between them (lengthier path). At the firm level, both the number of segments (overall diversification) and the unrelatedness of the diversification increase the average length of ownership structures. Additionally, geographic diversification—internationalization—is positively correlated with taller structures.

Our findings contribute to the literatures on diversification, organizational design, and financial economics. First, we offer evidence that diversification strategies explain a much larger share of pyramidal ownership structures than the traditional control enhancing view does. Second, we show that firms can adopt 'M-form' structures at the conglomerate level, replicating the (internal) multidivisional firm. Finally, we offer a managerial view that incorporates monitoring costs and attention as the main drivers of selection into structures (Alchian and Demsetz, 1972; Calvo and Wellisz, 1978; Joseph and Ocasio, 2012; March and Simon, 1958; Ocasio, 1997).

2.2 Classic Research on Pyramids

An entrepreneur who would like to control two or more companies could do so in a horizontal mode, that is, by owning the firms separately, or in a pyramidal structure, by owning one firm and having this firm own the others. If the entrepreneur desires to share the value (and therefore risks) accrued from the second firm with other shareholders, they would rather use the latter (Wolfenzon, 1998). The literature argues that such pyramidal structures are largely used to increase the control of large shareholders relative to the capital they have invested (Berle and Means, 1932; Tricker, 1984) or to derive private benefits of control, for instance by diverting value from one firm to

another (Almeida and Wolfenzon, 2006b; Dyck and Zingales, 2004). This has been thought to happen most frequently in countries with poor investor protection rights (La Porta *et al.*, 2002; Shleifer and Wolfenzon, 2002; Zingales, 1994).

Several papers in the financial economics literature find support for this claim of separation between control and cash-flow rights (Claessens *et al.*, 2000; Faccio and Lang, 2002; Khanna, 2000; La Porta *et al.*, 1999; Morck, Stangeland, and Yeung, 2007). This exacerbation of control rights in companies may create opportunities for the controlling parties to expropriate minority shareholders. In fact, there is substantial evidence that controlling shareholders in business groups use pyramidal structures to engage in propping, tunneling, or otherwise extracting private benefits of control (Bae, Kang, and Kim, 2002; Bertrand *et al.*, 2002; Chang, 2003; Johnson *et al.*, 2000; Lemmon and Lins, 2003; Riyanto and Toolsema, 2008). Because of these features and anti-trust issues, pyramidal structures, once ubiquitous in the United States, are now virtually absent in the largest economy in the world (Kandel *et al.*, 2019).

In addition to the expropriation of minority shareholders, the pyramids literature argues that this separation between control and residual rights may lead to governance problems as well. The multiple layers of ownership (and management) between parent and subsidiary creates a larger organizational distance (Belenzon *et al.*, 2019b), which can create incentive misalignments and agency problems between owners and managers (Durand and Vargas, 2003; Jensen and Meckling, 1976). Dispersed ownership can also weaken monitoring (Bebchuk *et al.*, 2000; Bennedsen and Wolfenzon, 2000; Berle and Means, 1932), adding to the governance issues and depressing corporate value (Attig, Fischer, and Gadhoum, 2004).

The traditional explanation for pyramidal structures and its consequences has not been uncontested. Franks and Mayer (2001) find little separation between cash-flow and voting rights in Germany. Similarly, Faccio and Lang (2002) find that deviation from one share—one vote is only significant in a few countries in Western Europe, which is further corroborated by Belenzon *et al.* (2019). Some scholars have also contested the notion that controlling shareholders in business groups use pyramidal structures to engage in tunneling and expropriate shareholders (Almeida *et al.*, 2011; Almeida and Wolfenzon, 2006b; Siegel and Choudhury, 2012). Finally, there is evidence showing that separation between control and cash-flow rights does not have any negative impact on firm value in places with strong minority shareholder protection, contradicting previous findings that these structures depress corporate value (Ben-Amar and André, 2006). These studies however only offer evidence contrary to the dominant view in a limited set of contexts.

The predominant view regarding pyramidal structures remains that they are mostly used to extract private benefits of control. The balance of evidence still bends toward the traditional view of pyramids, as this literature had decades to build strong theoretical arguments and provide empirical evidence to support them. However, as new data comes to light, these more recent challenges cast doubt in the once well-established notion of pyramids as expropriation mechanisms. Given the mixed evidence that currently characterizes this literature, we believe there is a need to explore a comprehensive set of data, that transcends particular locations or institutional contexts, in order to bring some clarity to the issue at hand. Thus, in the next section we present and explain our dataset and provide empirical evidence on whether the commonplace explanation for pyramidal structures hold in real world data or not.

2.3 Analysis of Separation Between Cash-Flow and Voting Rights

2.3.1 Data

The main source of data for this paper is the universe of companies in Bureau van Dijk's Orbis. We start with an initial sample of approximately 11 million potential parent companies holding 24 million subsidiaries. Each observation can contain a shareholder (and its corresponding shares), a focal firm, and a subsidiary. As our interest is ownership structures, we eliminate standalone companies—i.e., those with no listed subsidiaries.

A critical step in constructing this dataset is identifying which companies can be considered as parent firms. Parent (or apex) firms are those with no controlling corporate owners. Following Belenzon *et al.* (2019), we adopt two criteria for control: for publicly listed companies, control is attributed to any shareholder with stakes exceeding 20%, while private firms are controlled by shareholders surpassing a 50% threshold.[2] Companies that are controlled by families or governments are recorded as parent companies, but not as ultimate owners. Applying these criteria, we identify 1,176,240 parent companies from 201 countries, all of which have no controlling corporate owner and at least one controlled subsidiary.

Once the parent companies are identified, we identify paths from the apex firm to each final subsidiary. Figure 1 shows an example of a theoretical ownership structure where firm *A* is the parent company, *B, C,* and *D* are the first-level subsidiaries, and so forth. From this example, the paths included in our dataset would be *A-B-E, A-B-F-H, A-C-G,* and *A-D.* For subsidiaries, we

[2] Note that Orbis reports voting rights as the percentage of ownership, mitigating the potential issue of dual-class shares. However, we do not have any information regarding 'unusual' deviations from the one share—one vote norm, such as golden shares with veto power, side agreements on voting power of certain shareholders, or coalitions between minority shareholders. This is, admittedly, a limitation, but we do not believe it interferes with our results in any meaningful way.

adopt the criteria that control exists when direct ownership exceeds 50%. For example, subsidiary *I* in Figure 1 is not included, as the chain of control is broken at *D* (i.e., firm *A* would not be able to "force" firm *D* to invest in firm *I*, as *A* does not have control over *D*).

The final dataset comprises 2,886,931 paths and 2,936,563 unique subsidiaries across 211 countries. Tables 1 and 2 report, respectively, the number of unique firms in each ownership level and the number of paths by length (from the parent to the last included subsidiary).

2.3.2 Ownership Variables

Cash-flow and voting rights are most often than not identical in value but are in fact separate constructs. On the one hand, cash-flow rights correspond to the residual claims that can be attributed to each owner of the company. In a listed company, this would be equivalent to the dividend share each shareholder gets if the firm pays out all earnings. In other words, cash-flow rights reflect the exposure to risk (and returns) that a given investor has in a company. On the other hand, voting rights reflect the amount of control a shareholder holds over a firm. By definition, a shareholder who holds more than 50% of the votes in any firm has control over it, as it can overrule any other investor or coalition of investors who wish to oppose their will.

We follow standard practice in calculating cash-flow and voting rights (Faccio and Lang, 2002). Cash-flow rights are calculated as the cumulative ownership an owner has over a chain of ownership. For instance, based on the hypothetical structure of Figure 1, firm *A* would be entitled to 24% of the residual claims of subsidiary *G*, as it owns 80% of *C*, and *C* owns 30% of *G* in turn (80% x 30% = 24%). In terms of voting rights, the calculation consists of identifying the weakest link in an ownership path. Using the same example of path *A*-*C*-*G* from Figure 1, *A* is entitled to 30% of the voting decision in firm G (control = Min [80%, 30%]). In this hypothetical case, there

is a separation between cash flow and voting rights of 6 percentage points (p.p.), as the former amounts to 24% and the latter to 30%. In the absence of dual-class shares, voting rights are necessarily greater or equal to cash flow rights. It is also worth noting that given the threshold of 50% we have adopted in this paper, cross-ownership of companies is virtually non-existent, rendering the weakest link method equivalent to more sophisticated ones, such as proposed by Almeida *et al.* (2011).

2.3.3 Data Analysis

A central point of this paper is to test whether the idea that pyramidal ownership is a mechanism mainly used to enhance control rights of ultimate owners—i.e., to create a gap between cash-flow and voting rights. Therefore, we analyze all the pyramidal paths in our dataset—that is, those paths that go beyond just the first (direct) level of ownership—to check the prevalence of this feature.

Figure 2 shows the distributional plot of ownership gap (the difference between cash-flow and voting rights) for the nearly 700 thousand pyramidal paths in our data. We find that the average ownership gap of pyramidal paths is 3.1 p.p., which is very low. As portrayed in Figure 2, 68% of the paths have no separation whatsoever, 77% of them have an insignificant gap (less than one percent), 87% have less than 10% of gap, and less than 1% have separation above the 30% mark. In summary, our data confirms on a global scale the observations of previous regional studies that find that control enhancing structures are in fact quite rare (Belenzon *et al.*, 2019b; Franks and Mayer, 2001), and thus cannot be the main reason for the existence of pyramidal structures.

This pattern is consistent across different industries and different sets of countries, as is depicted in the multiple panels of Figure 3. In Panel *A*, we show that the distribution of ownership gap is very similar for countries that are members of the OECD and those that are not. Similarly, Panel

B offers the same result for countries that are characterized by the prevalence of business groups (e.g., India, Japan, South Korea, Spain) versus those that are not. Finally, we notice in our data that companies in the broad industry (two-digits) classifications of "Finance and Insurance" and "Management of Companies and Enterprises" make more frequent use of pyramidal ownership paths. However, as Panel *C* shows, the distribution of separation between cash-flow and voting rights for these two industries are very close to that of all other industries.

2.4 Theory

After looking at the data on pyramidal ownership structures on a global scale, it becomes unquestionably clear that there must be another reason—besides to extract private benefits of control—to why they exist. Recent work looking at some interesting consequences of pyramidal ownership can give us a possible avenue to developing a new theoretical understanding of this phenomenon. These studies show that subsidiaries that are further removed from the ultimate owner—through more layers of ownership—enjoy greater autonomy than those that are closer to the top (Belenzon *et al.*, 2019b; Fan *et al.*, 2013). More specifically, they find that subsidiaries further down the ownership chain are more insulated from interventions by the ultimate owner—such as the state (Fan *et al.*, 2013)—and behave closer to how a standalone firm would (Belenzon *et al.*, 2019b).

These findings highlight a feature that is virtually opposite to the arguments of the control enhancing view. While in the traditional view owners use pyramidal ownership to exert control over a larger number of firms, the evidence presented by Belenzon *et al.* (2019) and Fan *et al.* (2013) shows that pyramidal ownership can be a way for parent firms to have *less* influence over their subsidiaries. The advantage of doing so is that rationally bounded managers and owners of

the parent firm can distribute their limited attention to other issues that are perhaps more central to the group operation or better managed by the parent firm (Joseph and Ocasio, 2012; March and Simon, 1958; Ocasio, 1997).

What these findings suggest is that parent companies may very well use the legal organizational design of the group to maximize managerial efficiency. The claim that organizational design has a tremendous effect in how firms are managed is certainly not new, but its focus has been almost exclusively contained within the boundaries of the firm. However, some of the most relevant issues that affect firms internally—and that can be solved or mitigated with the appropriate organizational design (Athey and Roberts, 2001)—are easily transferrable to outside a single firm's boundary and play a very similar role within a conglomerate.

2.4.1 Types of Structural Hierarchies

As firms' operations get more complex, they must decide how to partition their activities and how to coordinate them properly. Two common types of structures arise from this coordination problem, namely the functional and the multidivisional (or M-form) forms. There has been a long-lasting debate about the efficiency of M-form organizations, with some scholars defending that this type of structure is more efficient in managing diversification strategies (Chandler, 1962; Williamson, 1975) and providing better incentives to managers (Maskin, Qian, and Xu, 2000), while others argue that they sacrifice both coordination benefits and long-term gains from innovation (Hoskisson, 1987; Hoskisson, Hitt, and Hill, 1993).

Indeed, as Chandler (1990) notes, the multidivisional firm surged in the early twentieth century to accommodate the growth and diversification of large companies, as the centralized approach led to a general loss of accountability and a breakdown in communication. Since then, the M-form

organization grew into the favored type of structural design for large firms due, among other things, its ability to better cope with both related and unrelated diversification strategies (Fligstein, 1985).

2.4.2 Agency Problem, Monitoring Costs, and Span of Control

Some of the major considerations when thinking about the design of an organizational hierarchy are (i) how fast can the firm make decisions; (ii) how one decision affects the rest of the firm; (iii) who should be making different kinds of decisions; (iv) how broad should a manager's responsibility be; (v) how to align employees' incentives with those of the firm; (vi) how to monitor the quality of employees' work. Evidently, these aspects are all connected to one another. For instance, Williamson (1967) argues that hierarchies create a 'loss of control' through each step that a decision goes through, as subordinates only fulfill a fraction of their superiors orders, and this gap between the original intent and what is actually realized can only go up the taller the hierarchy. Nonetheless, Calvo and Wellisz (1978) show that this is only true if employees are aware of when they are being monitored.

We try to organize these literatures and their interconnections into three broad areas: span of control, monitoring costs, and agency problems. Span of control relates to the breadth of a manager's responsibility—i.e., how much should be on one's plate. This is important because it affects not only the firm's costs, but also how fast, accurate, and optimal for the broader organization decisions are (Keren and Levhari, 1979, 1989). There is a tradeoff in allocating decision power to either lower or higher levels in a hierarchy. On the one hand, lower-level management is closer to the source of information and can make faster decisions. On the other hand, higher-level management can see the bigger picture in an organization and is likely to have incentives more closely aligned to those of the firm.

Agency problems relate to the misalignment of incentives between two parties, such as a principal (e.g., a shareholder) and an agent (e.g., a manager) (Jensen and Meckling, 1976). Incentive misalignment is a key consideration when setting up any structure or operation, as any firm that is not an owner-manager, single person operation has some increasing degree of agency conflicts (Ang, Cole, and Lin, 2000). Agency problems also moderate how one thinks about the span of control in a hierarchy. For instance, Jensen and Meckling, (1995) argue that moving the decision power allocation away from the best-informed party generates communication and efficiency costs, but in the presence of agency problems, it may lead to allocating these rights with a party with better incentives to make good decisions. Many firms have tried 'flattening' their structures (Rajan and Wulf, 2006) to minimize the issues of span of control and incentive misalignment, but as noted by Athey and Roberts (2001), the solution may not be so simple and hierarchies end up being a natural occurrence. In fact, many firms that tried flattening their hierarchies produced the opposite effect from the one they expected (Wulf, 2012).

Finally, monitoring costs exist mostly because of agency problems. As parties attend to different interests and motivations, principals must then monitor their agents to ensure they are acting the way they were supposed to—and that action entails a cost. In a world with no incentive misalignment, there would be no need for monitoring. Monitoring is, however, imperfect, as many actions and intentions are unobservable, or results cannot be properly attributable to single individuals or units (Alchian and Demsetz, 1972). Efficient monitoring can partially resolve the issue of span of control (Calvo and Wellisz, 1978), but the span of control in turn affects how costly monitoring can be (Jacob and Page, 1980).

2.4.3 Extending Organizational Architecture to the Conglomerate Level

A very relevant characteristic of the M-form organizational type to this study is that it can easily accommodate corporate groups—here defined as a group of subsidiaries connected to a parent company through controlling ownership links—with similar structures (Bethel and Liebeskind, 1998). That is, instead of a firm organizing its activities as sub-divisions internally, a parent company can own (either entirely or partially) subsidiaries that are similar to what internal divisions would be but are in fact legally separated entities.[3]

Although scholars most commonly refer to the functional and multidivisional forms of organizational architecture, there are several other typologies, such as unitary and geographical (Rumelt, 1974). We argue that parent firms can organize their groups' architecture in similar ways to any of these internal organizational forms, and the shift from more centralized forms (i.e., unitary or functional) to more decentralized ones (i.e., multidivisional, geographical) depends largely on agency problems, and communication and monitoring costs.

Consider a parent firm that directly controls *N* subsidiaries in a completely horizontal (flat) ownership structure. The parent firm, as the principal in such relationships, is responsible for monitoring the actions and performance of all its subsidiaries, which in this case act as the agents. If the firm wants to add an additional subsidiary to its portfolio (regardless if through acquisition, spin-off, or simply a new creation), it can do so in one of two ways: directly or indirectly. To add a new directly owned subsidiary would mean the firm has now *N+1* agents to monitor in a completely flat structure.

[3] The tradeoffs between establishing legally independent subsidiaries versus creating sub-division internally is beyond the scope of this paper. See Bethel and Liebeskind (1998) for a thoughtful discussion on the subject.

Alternatively, the parent firm may choose to add this new company as a subsidiary of one of its existing subsidiaries. The parent company would still have *N* agents to monitor in a flat structure, and one subsidiary would be now acting as a principal to this new venture located at the second layer of ownership. This path from the parent firm to the second layer subsidiary now constitutes a pyramid, while the rest of the direct paths remain horizontal.

There are two important considerations that come out of this example and that constitute a tradeoff in choosing the format of the group's ownership design. First, as *N* increases, the monitoring costs do too. In other words, an increase in the span of control—that is, having more things to monitor—makes it more costly to the principal to monitor its agents (Jacob and Page, 1980). In that sense, adding a new venture as a directly owned subsidiary is more costly in terms of monitoring than having it as a second layer subsidiary.

Second, as the number of ownership layers increase, so do communication costs and agency problems. As Belenzon *et al.* (2019) notes, added layers of ownership create an 'organizational distance' between firms, resulting in increased difficulties in communications and possibly a delay in decision-making if the parent firm has to make/approve decisions (Keren and Levhari, 1989). Also, added layers of hierarchy (represented by ownership) will lead to more managerial friction and increased agency problems, as agents also become principals (Durand and Vargas, 2003; Williamson, 1967). Hence, when considering agency problems and communication costs, adding a new subsidiary via direct ownership is more advantageous than owning it through a pyramidal structure.

As owners and managers are boundedly rational there is only so much attention they can disperse, so when dealing with multiple subsidiaries or lines of businesses they must choose how to allocate

their efforts (Ethiraj and Levinthal, 2004; Foss *et al.*, 2021; Ocasio, 1997; Tripsas and Gavetti, 2000). However, managing the same number of subsidiaries may not be equally demanding for any set of companies. That is, monitoring the activities of two very similar companies is likely not the same as monitoring the activities of two distinct activities. Therefore, if monitoring *N* subsidiaries result in *X* amount of cost, monitoring *N+1* does not necessarily entail in *X+1* costs—it depends on how similar the activity of the new subsidiary is compared to the existing ones.

To formalize our argument, we state three key assumptions that together generate the predictions we derive below:

> *A1: Rationally bounded individuals (managers/owners) have to divide their limited attention between the businesses at hand. Adding a new business forces them to redistribute cognitive capacity and thus affect all businesses.*
>
> *A2: Each additional business requires a minimum amount of attention to be managed. The amount of attention required increases with the dissimilarity between the new business and the existing businesses (both of the parent firm and its subsidiaries).*
>
> *A3: Managing a business with subsidiaries requires no more attention than managing one without any, as the responsibilities of managing subsidiaries are delegated to their immediate owner (the direct owner of the subsidiary).*

We argue that, when deciding on the organizational design of their ownership structures, firms try to minimize costs—i.e., try to make management as efficient as possible. Assumptions *A1* and *A2* jointly imply there is a maximum span of control for each ownership layer, with greater spans possible for more similar businesses. Combining them with *A3*, and based on our previous argumentation, a firm considering how to own a new subsidiary will opt to own it through a

pyramidal structure if the monitoring costs of adding the firm in a flat structure are greater than the agency problems and communication costs associated with the additional layers of ownership. This is more likely to happen the more unrelated the new subsidiary is to the other existing businesses:

> *H1: The scope of industrial diversification is positively correlated with the length of ownership paths.*

It is not only relevant how similar the activities of subsidiaries are to one another, but also how (un)related they are to the parent firm itself. As the core activity of a subsidiary gets more distant from that of the parent firm, it is reasonable to assume that the difficulty in monitoring its operations and results increase (*A2*). This argument resonates with the findings that firms engaging in unrelated diversification perform worse than those that are focused or diversify to related activities (Rumelt, 1974, 1982). Thus, as monitoring costs rise with an increase in unrelatedness, it may be advantageous for the parent firm to set up intermediary companies between itself and the unrelated subsidiary to 'bridge' industrial distance. Put formally:

> *H2: Industrial separation between parent and progeny is positively correlated with the length of ownership paths.*

It is fairly straightforward to extend the previous arguments into geographical diversification. Monitoring and transferring information to subsidiaries that are geographically distant is more costly than monitoring those that are close to the parent firm (Landier, Nair, and Wulf, 2009; Lin and Png, 2003). Thus, adopting a more decentralized approach, where subsidiaries in different geographic locations are managed by regionally-focused units may be better than a more centralized organization (Qian and Xu, 1993). In other words:

H3: Geographical diversification (internationalization) is positively correlated with the length of ownership paths.

2.5 Data and Methodology

2.5.1 Dependent Variables

We conduct our analyses at two different levels: the path and the firm. For the path level analysis, the dependent variable is the length of each path. Length captures the number of layers of subsidiaries that the control from the parent company runs through. Looking at the example in Figure 1, the path *A-C-G* would have length equals two, while *A-B-F-H* would have length equal to three. Aggregating at the firm level, the dependent variable becomes the average length of paths in a given firm. Using the example in Figure 1 once again, the average length of paths of parent company A would be two (from left to right, [2+3+2+1]/4 = 2).

2.5.2 Independent Variables

Our variables of interest change depending on the level of analysis. In the path level, we are interested in two aspects (and their interaction): the industry distance between parent and progeny (the last subsidiary in a path), and if the path crosses national borders. The latter is measured as a dummy variable, which is equal to one if any of the subsidiaries in a given path are located in a different country from the parent company, and zero otherwise.

Industry distance is measured based on the four-digit NACE code of firms, and ranges from zero (identical four-digit segment) to four (completely different segment). The NACE code is a European standard that classifies companies into different segments, with added degree of specialization. NACE industry codes get more specific with each digit added, so if two firms share the same four-digit NACE code their core activities are closer than that of two firms that share

three digits of their NACE code. For instance, the NACE code '0121' corresponds to "growing of grapes", while the code '0123' corresponds to "growing of citrus fruits". Both of these codes share the first three digits '012', which refers to "growing of perennial crops". Hence if two companies are classified as category '0121', their activities are more similar than if one of them were classified as '0123'. The same logic applies to the first two digits.

At the firm level, we aggregate these two variables to get the average industry distance between parents and progenies, and a dummy that captures if the firm can be considered a multinational company (MNE) or not. The dummy MNE equals one if any of the paths within a firm are international (that is, the parent has at least one foreign subsidiary), and zero otherwise. In addition to these two variables, we also measure the amount of diversification within groups. We capture this feature by counting the number of distinct four-digit NACE segments reported by the parent companies and all of its subsidiaries. Lastly, we also generate categorical variables for the diversification measures to conduct robustness checks. Each category corresponds to one third of the data.

2.5.3 Control Variables

In addition to the independent variables of interest, we add different control variables in our models. At the path level, we control for two-digit industry fixed effects as well as country fixed effects of both parent and progeny companies. At the firm level, we control for two-digit industry and country fixed effects of parent firms. Finally, we control for the parent firms' assets in some specifications. Nonetheless, as most firms do not share this information, the sample is greatly reduced.

2.6 Descriptive Statistics

2.6.1 Ownership Paths

In this subsection we briefly describe some data patterns of the ownership paths we observe in our data. Out of the 2.89 million paths in our sample, 2.36 million (81%) are domestic, and 526 thousand (19%) are international. Domestic paths are on average shorter (mean length is 1.25)—and over 75% of them lose control after one layer—than international ones (mean length is 1.83).

We search in our data for descriptive evidence that can shed light on the reasoning behind the existence of pyramidal paths. We start by graphically looking at the relationship between the length of a path and the industry separation between parents and progenies. Analogously to what we do with ownership gap in Figures 2-3, we plot the distribution of industry separation between parent firms and its progenies for both pyramidal and direct paths as a comparison.

There are two interesting patterns that emerge from this exercise, which are shown in Figure 4. First, close to 90% of pyramidal paths have some degree of industrial distance between the parent firm and the last subsidiary in the control chain, and over 65% of them have the largest possible distance. Although not strictly comparable, (un)relatedness of subsidiaries activities seem to explain a lot more about the existence of pyramidal ownership than separation of voting and cash-flow rights does. Second, direct paths—those that end at the directly owned subsidiary—are considerably less diversified than pyramidal paths, with over half of the former having no degree of industrial separation between parent and progeny, and less than a third having the maximum level of separation.

We continue our graphical descriptive analysis using binned scatterplots, a very simple and useful tool to non-parametrically identify patterns in the data (Starr and Goldfarb, 2020). Figure 5 shows

that there seems to be a clear relationship between length and industry separation, with an upper mean and (slight) trend shift for international paths. We repeat this exercise using the average industrial separation between each link of the path instead of just the parent and progeny. That is, suppose we have the path *A-B-C-D*. The industrial separation between parent and progeny would be the difference in NACE code digits between *A* and *D*, while the average distance between each link would be the mean of differences between *A-B*, *B-C*, and *C-D*. Figure 6 shows that there is a slight decrease on the length of paths as the average industrial separation increases for international paths, while the contrary is true for domestic ones.

In addition to the graphical analyses, we also conduct t-tests in two dimensions, namely between direct and pyramidal paths, and industrial separation between parent and progeny and between each link. Table 3 shows the results of these exercises. In the columns, we have direct paths and pyramidal tests, while in the rows we have distances from parent to progeny and between each link. The vertical differences (within each type of path) are from a paired t-test, as the observations—distance between parent and progeny and each link—come from the same ownership path. The horizontal differences (across each type of path) are from a two-sample t-test with unequal variances, as the observations come from distinct ownership paths.

The collective evidence of descriptive statistics indicate that pyramidal paths have on average a larger industrial separation than direct paths. Moreover, the difference between industrial separation between parent and progeny and each link of the path suggests that firms may use intermediary companies to ‘bridge’ such distance.

2.6.2 Firm Level

We repeat some of the exercises on the previous subsection at the (aggregated) parent firm level. The 2.89 million paths are collapsed into 1.17 million firm level observations, being 88% of them domestic firms and 12% multinational companies. Multinational firms are on average larger in terms of subsidiaries (7.2 subsidiaries per parent) than domestic firms (1.9 subsidiaries per parent) and have more ownership paths (6.6 for MNEs and 1.9 for domestic firms). Furthermore, MNEs tend to have longer paths on average (1.33) than domestic firms (1.08).

We also use binned scatterplots (Starr and Goldfarb, 2020) at the firm level to gain a better understanding of the relationship between ownership structures and diversification. Figure 7 corroborates the evidence at the path level by showing that there is a positive correlation between average industrial separation (from parent to progenies) and the firm's average length of ownership paths. An interesting pattern emerge when we look at the same correlation but taking the average industrial distance between each link. As shown in Figure 8, there seems to be very little to no correlation between the variables, which hints once again that firms may use intermediary companies to smoothen the transition to more unrelated activities.

In Figure 9, we investigate the relationship between the breadth of diversification—that is, in how many different segments a parent firm and its subsidiaries are, regardless of how (un)related the activities might be, and the average length of ownership paths. We find a very clear positive correlation between these two variables, suggesting that firms may also use pyramidal structures to manage larger numbers of different activities.

We also conduct a battery of t-tests with our variables of interest to further illuminate the potential reasons behind the existence of pyramidal ownership structures. These tests are reported in Table

4 and are divided in two panels. “Tall firms” represent any firm that has at least one pyramidal path—i.e., the average path length is strictly greater than one, and perfectly flat firms are those with direct investments only. Panel A replicates the same two-dimensional exercises from Table 3 with firm level data. We find results that are consistent with the path level data, meaning that tall firms seem to use pyramidal structures to ‘bridge’ industrial distance, and that their diversification tend to be more unrelated than those of flat firms.

Panel B of Table 4 shows a different test that cannot be conducted at the path level. We look at the difference between the breadth of diversification in tall versus flat firms and find that tall firms are on average involved in a larger number of four-digit segments than flat firms.

2.7 Results

We test our predictions regarding the format of ownership structures at two levels of analysis, the path, and the firm. These two distinct levels of analysis offer complementary insights and help us paint a more comprehensive and robust picture of the phenomenon. The path level data sheds light on the decision-making firms engage in for each individual ownership chain, while the firm level data aggregates information on all the paths and help us understand how firms manage their entire portfolio.

2.7.1 Path Level

We start by analyzing the effect of industry separation (i.e., how distant two core activities are) between parents and progenies and internationalization at the path level. Since the path only conveys information about a particular decision, we can only analyze them in isolation—that is, without looking at the broader portfolio of the parent firm.

Table 5 shows the results of three models with close to two million observations each, all including two-digit industry and country fixed effects of both parent and progeny firms. Standard errors are clustered at the ultimate owner level in all analyses to account for the possibility that two parent firms are owned by the same non-corporate owner (e.g., a family). The dependent variable in all models is the length of a given path, which can take integer values between one (a completely flat path) and nine.

Model (1) only includes the industrial separation between parent and progeny—which can take integer values between zero and four. The coefficient is positive and significant at $p<0.001$. This is in line with the predictions of H2. Model (2) adds a dummy capturing if subsidiaries in the path are located in a country other than the one of the parent firm. In line with the predictions of H3, the dummy has a positive and significant coefficient at $p<0.001$. The magnitude of the effect of industrial separation decreases with the addition of the international dummy, but the coefficient remains positive and significant at the same confidence level. Lastly, model (3) adds interaction terms between the internationalization dummy and industrial separation. All coefficients are positive and significant at $p<0.001$, indicating that the effect of industrial separation on the length of a path is considerably more pronounced if the subsidiaries are in a different geographical location from the parent firm.

2.7.2 Firm Level

We now move the analysis to a more macro level, where we aggregate all the paths originated at a parent company into one observation. Despite missing some of the rich variance and detail we have on the individual path level, investigating the firm level data can bring us new insights on how the firm manages its portfolio of subsidiaries when taking them simultaneously into account. As in the path level analyses, all models in Table 6 have clustered standard errors. The dependent

variable in all models is the average length of paths originating from the parent firm. Moreover, models (1)-(7) control for two-digit industry and country fixed effects of the parent firm, and models (8)-(9) add a control for firm size through their assets.

Model (1) of Table 6 only includes the group's breadth of diversification, that is, the number of distinct four-digit NACE segments the parent firm and its subsidiaries have listed as their core activities. As predicted in H1, the breadth of diversification is positively, and significantly at $p<0.001$, correlated to the average length of paths. Model (2) includes only the average industrial separation between parents and their progenies and confirms the findings at the path level and the hypothesized relation in H2, which is that an increase in the unrelatedness of subsidiaries is associated to an increase in the length of ownership paths. In Model (3) both variables are included and remain positive and significant at $p<0.001$.

In model (4) we include the MNE dummy to capture internationalization, and find that it has a positive, significant effect at $p<0.001$ on the average length of paths, reenforcing the results of the path level analysis and providing additional support for H3. Models (5)-(7) introduce interaction terms between the MNE dummy and each of the diversification variables. While all the base coefficients remain positive and significant at the same level, the interaction between internationalization and breadth of diversification yields a negative, significant coefficient, indicating that the organizational structure of domestic firms is more affected by the variety of segments than are MNEs (although the combined effect is still positive for MNEs).

Finally, models (8) and (9) replicate models (4), with base coefficients only, and (7), with all interactions, including now a control for the parent firms' assets. The upside of doing so is that we are able to control for structural differences that can be simply attributed to the firms' size.

However, doing so drastically reduces the number of observations, as most firms do not have available information regarding their assets. While models (1)-(7) have over 900 thousand observations, models (8)-(9) are just short of 41 thousand firms. Nonetheless, all coefficients remain significant and retain their signs despite facing a reduction in their magnitudes.

2.7.3 Robustness Checks

As a robustness check, we repeat the analyses at both the path and firm level that are shown in Tables 5 and 6 with binned variables. As coefficients associated to continuous variables may sometimes be entirely driven by a subsection of the data or hide non-linear relationships that are present in the data, we create categorical variables for the diversification measures we have. Appendix 1 shows the results of the replication of the path level analysis. All coefficients remain in the expected direction and point to a (non-monotonic) increasing effect of industrial separation as it gets larger.

Appendix 2 in turn shows the replication of the firm level analysis on Table 6. The results are largely aligned with the initial analysis, but some interesting details surface when using binned categories. For instance, the median category of industry relatedness has a negative or null effect on length compared to the baseline of related diversification. We believe that both of these robustness checks are in line with the main analyses despite small variations.

Another potential concern is that firms in the industry sectors of “Finance and Insurance” and “Management of Companies and Enterprises” might be systematically different from other companies and drive the results of the paper. This is because finance companies may act as holding companies that do not interfere in the operations of their subsidiaries, while “management” firms may be created for the single purpose of owning other assets, which could potentially create a

problem in the industrial separation measures. We thus run the main analyses of the paper excluding firms and paths in these two broad segments. Appendix 3 and Appendix 4 present these analyses for the path and firm level, respectively. The results indicate that our main analyses are robust to the exclusion of these two sectors, thus eliminating the concerns they might be single handedly driving all the results.

2.8 Discussion

We investigate the ownership links of millions of firms in virtually every country in the world to understand what influences the selection into different formats of legal organizational structures. Our data shows that the longstanding explanation for the existence of pyramidal ownership, which characterizes them as control magnifying structures used to extract private benefits of control, cannot be the main driver for the adoption of these architectures. That being said, we do not claim that this view is mistaken—there is a robust body of literature showing that, in some cases, these structures can be used to expropriate minority shareholders and magnify the economic reach of influential families. Nonetheless, more recent studies, including this one, have questioned the extent to which this view can explain pyramidal structures. According to our data, it can only explain, at most, 20%.

Our goal is then not to object, but to complement the understanding we have on multilayer ownership structures by providing an alternative view of their existence. We propose that pyramidal ownership can be used to maximize managerial efficiency in a diversified conglomerate by minimizing monitoring costs. Our argument is that as parent firms diversify into different activities and geographies, the costs associated with monitoring their subsidiaries increase, and more so if the diversification is unrelated to the core activities of the parent. Thus, despite the

agency and communication costs associated with pyramidal ownership, the adoption of such structures is increasingly attractive in the presence of rising monitoring costs.

The descriptive analysis of the data clearly indicates that there is a positive correlation between diversification and the length of ownership chains. Importantly, it also shows that most pyramidal paths have at least some degree of unrelatedness between the activities of the parent firm and the final subsidiary in the ownership path. This gives us some reassurance that the view we are proposing can potentially explain a large share of multilayered structures. Our econometric analyses then confirm the relationship between diversification and pyramidal structures and show that it is robust to the inclusion of a diverse set of controls, exclusion of potentially concerning industries, and alternative construction of the independent variables.

All three predictions developed in the theory section are consistent with the empirical results we find. The first hypothesis argues that an increase in the scope of diversification is positively correlated with more pyramidal ownership, as the limited cognitive capacity of owners and managers has to be divided between more affiliates. We find that for every additional 15 to 20 four-digit NACE industry segments (there are 615 of those) the group has activities in, the legal organizational structure grows one layer.

The second hypothesis states that there is a positive correlation between how unrelated the core activity of a subsidiary is to the parent firm and lengthier paths. This is because it is more costly to monitor an unfamiliar activity. We find evidence that this relationship is positive and significant, but the magnitude is not large. A company that is completely unrelated to the core activity of the parent has on average an increase in the length of the path of 0.1 to 0.37. Similarly, the average

length of the group only increases between 0.13 to 0.29 when comparing a perfectly related group (all subsidiaries share the same four-digit code as the parent) to a completely unrelated group.

The last prediction is that geographic diversification, similar to industrial, creates larger monitoring costs and thus is correlated with lengthier paths. We find empirical support for this hypothesis, as international paths have on average 0.33 to 0.52 more layers than domestic paths. At the group level, MNEs have on average 0.1 lengthier structures than domestic firms do. Additionally, we find interaction effects (that were not hypothesized) between internationalization and diversification. The results indicate that internationalization has a positive moderating effect on the relationship between unrelatedness and lengthier paths, while the moderating effect for scope of diversification is negative.

The reason we find such small coefficients in our analyses is due to the fact that the vast majority of paths in our data are flat (meaning their length is equal to one). There are three main reasons why this is the case. First, we adopt very strict cutoffs when constructing the data. We only include paths that allow for the parent firm to control the subsidiaries and set the most conservative threshold for it—i.e., 50%. Second, the country that has the highest share of parent firms and subsidiaries in our sample is the United States. As Kandel *et al.* (2019) explain, pyramidal ownership has been virtually eliminated from the US following stricter antitrust regulation in the 40's and 50's, although some families still manage to attain separation between voting and cash-flow rights, making the US the developed country with the highest average ownership gap of all (Villalonga and Amit, 2009). Third, we only include paths when we are sure about the direct

ownership link connecting one firm to another. This means that we exclude potential pyramidal paths for which we have unreliable or no data.[4]

We add to the previous body of knowledge in economics, finance, and management in three main ways. First, we provide ample evidence that pyramidal structures, in their vast majority, are not used to create a wedge between voting and cash-flow rights. We provide an alternative explanation that considers agency, communications, and monitoring costs associated with the scope and unrelatedness of diversification as key factors in the maximization of managerial efficiency. Second, we apply ideas from the organizational design literature, which focuses on hierarchies within the boundary of the firm, to the design of conglomerates. Third, we contribute to the strategy and corporate finance literature by adding a new consideration when studying the effects of diversification: ownership structural design.

New perspectives applied to an old problem may completely shift well established results, as it was the case of taking into consideration the strategic orientation of business groups in investigating tunneling in India, for instance (Siegel and Choudhury, 2012). The effects of diversification on firm performance have been a topic of debate for a long time. Some classical research argues that diversification in well-developed financial markets is harmful for firm performance, especially if unrelated (Amihud and Lev, 1981, 1999; Rumelt, 1974, 1982). Other studies, however, argue that diversification has no effect or positive effects on firm performance in the same context (Montgomery and Singh, 1984; Villalonga, 2004). Future studies on the topic

[4] Orbis reports two types of ownership data: Direct and Total. Direct ownership corresponds to the voting shares of company A over company B, held directly by company A. Total ownership is the aggregate voting share that company A has of company B. This may be a result of direct ownership, indirect ownership, or any combination between them. The lack of transparency is a problem when assembling a dataset with the objective of studying the very structure of companies. We have searched in our raw dataset for cases where we do not include paths because we only have a figure for Total, but not for Direct ownership, and estimate that there is a loss of about 10% in the sample size.

should take into consideration how firms manage diversification not only within their boundaries, but also among their corporate group. The findings of this paper may be useful to understand if the legal organizational structure of groups can moderate the link between diversification and performance.

2.8.1 Future Studies and Alternative Explanations

Although we believe that diversification explains a significant portion of the variance in the legal organizational design of firms, we realize there may be alternative explanations to the phenomenon. We list some of them in this section and suggest them as future avenues for research in this topic.

Firms may attempt to design corporate groups that minimize their tax burden. Previous research has shown that tax minimization or avoidance may be an important strategic variable to firms, especially multinational companies (Bilicka and Scur, 2020; Bilicka, 2019; Davies *et al.*, 2017; Gumpert, Hines, and Schnitzer, 2016; Hines and Rice, 1994; Koester, Shevlin, and Wangerin, 2016). We do see in our data some relationship between pyramidal ownership and location in tax havens or offshore tax conduits, but we leave it for future studies to disentangle any possible theoretical reasoning between the formal of the ownership design and tax strategies that go beyond the simple incorporation of subsidiaries (Bethel and Liebeskind, 1998).

It may also be the case that firms choose different legal organizational designs to fill institutional voids. For instance, firms located in countries with weaker financial development can leverage internal capital markets to cross-finance or insure their operations (Almeida and Wolfenzon, 2006a; Belenzon, Berkovitz, and Rios, 2012; Chittoor, Kale, and Puranam, 2015; Khanna and Yafeh, 2005; Lamont, 1997; Liebeskind, 2000; Masulis, Pham, and Zein, 2020). Corporate groups

can also take advantage of shared resources to create economies of scale and scope, or overcome labor market frictions by redeploying human capital internally (Belenzon and Tsolmon, 2016; Khanna and Palepu, 2000; Khanna and Rivkin, 2001; Manikandan and Ramachandran, 2015). However, it is unclear if the shape of organizational structures in such groups—besides group affiliation itself—play any role in this.

Finally, pyramidal ownership can be a way for large firms to experiment with new ventures or 'test the waters' in new markets. One could view sequential layers of ownership as experiments that, once established, can start experiments of their own. There is evidence that firms affiliated to business groups are more innovative than standalone firms, as they can take advantage of internal capital markets (Belenzon and Berkovitz, 2010). Additionally, some studies have shown that M-form organizational architectures are more conducive to experimentation within firms because of their flexibility in allowing small-scale and local experimentation (Qian, Roland, and Xu, 1999, 2006). Pyramidal ownership could thus mimic the flexibility necessary for start-ups to succeed, as they can provide greater autonomy from the parent firm, especially in small scale experiments that do not severely affect their cash-flow (Belenzon *et al.*, 2019b; Fan *et al.*, 2013; Makhoul, Musacchio, and Lazzarini, 2020). We believe this to be a promising avenue for future research in innovation within large corporations.

2.9 Conclusion

We have shown in this paper that the traditional view in the financial economics literature that pyramidal (multilayer) ownership exists mainly to create a separation between cash-flow and voting rights does not hold in most cases. We then offer an alternative perspective that views pyramidal structures as a way of maximizing managerial efficiency by minimizing monitoring

costs in face of diversification in corporate groups. We assemble a novel dataset containing over four million companies and spanning virtually every country in the world to test this hypothesis.

Our findings support the idea that diversification can be a determinant of legal organizational design in corporate groups. We show that there is a positive correlation between the scope and unrelatedness of industrial diversification, as well as geographical diversification, and the number of controlling ownership layers (length) firms have. We demonstrate that this is true both when looking at parent and progeny firm in isolation (path level) and when looking at the aggregate portfolio of subsidiaries (firm level). Our findings are robust to the inclusion of a wide array of controls, alternative constructions of independent variables, and exclusion of some broad industries.

This study contributes to literatures in management, finance, and economics by offering a new take on the existence of pyramidal structures that incorporates agency, communication, and monitoring costs, and extends the ideas of the organizational design literature beyond the boundaries of the firm. Our also study brings a new perspective to how firms manage diversification in their portfolios.

2.10 Tables and Figures

Figure 2.1 - Example of a corporate ownership structure

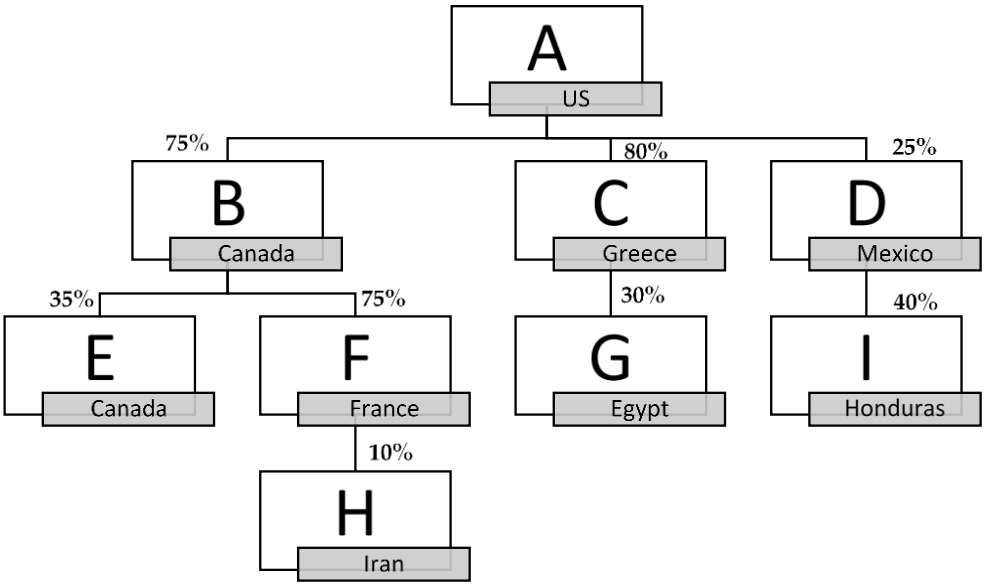

Figure 2.2 - Quantile plot of ownership gap

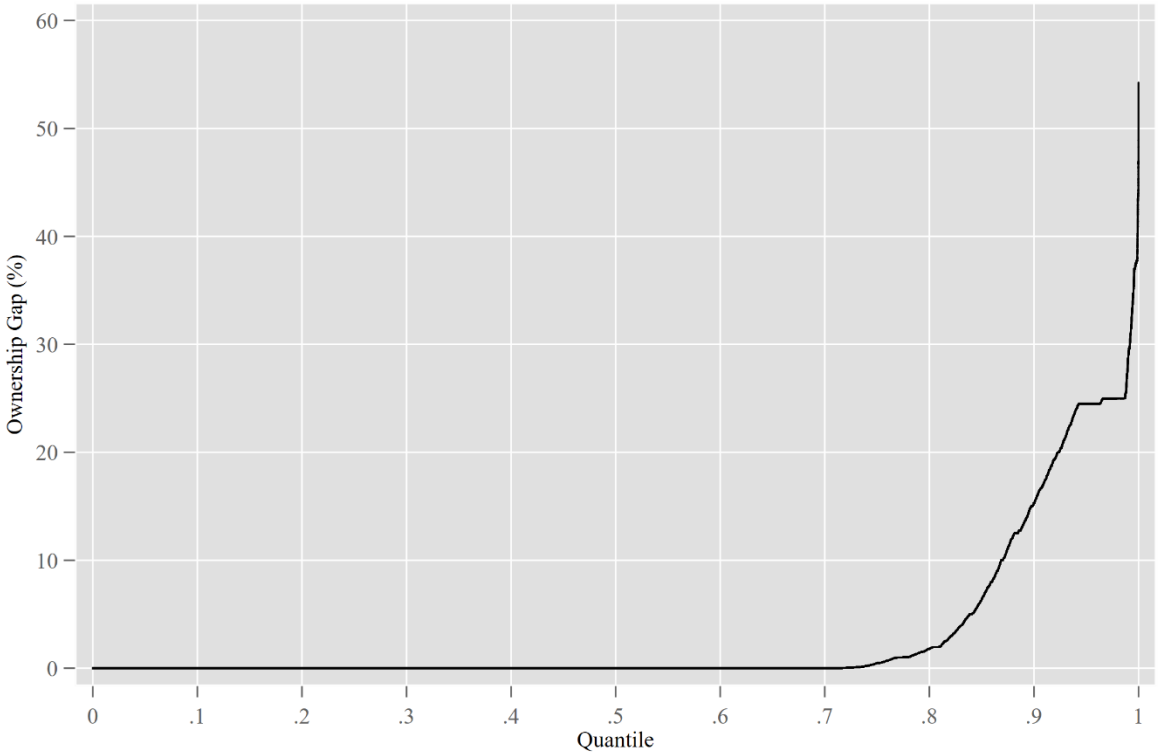

Figure 2.3 - Quantile plot of ownership gap by various groupings

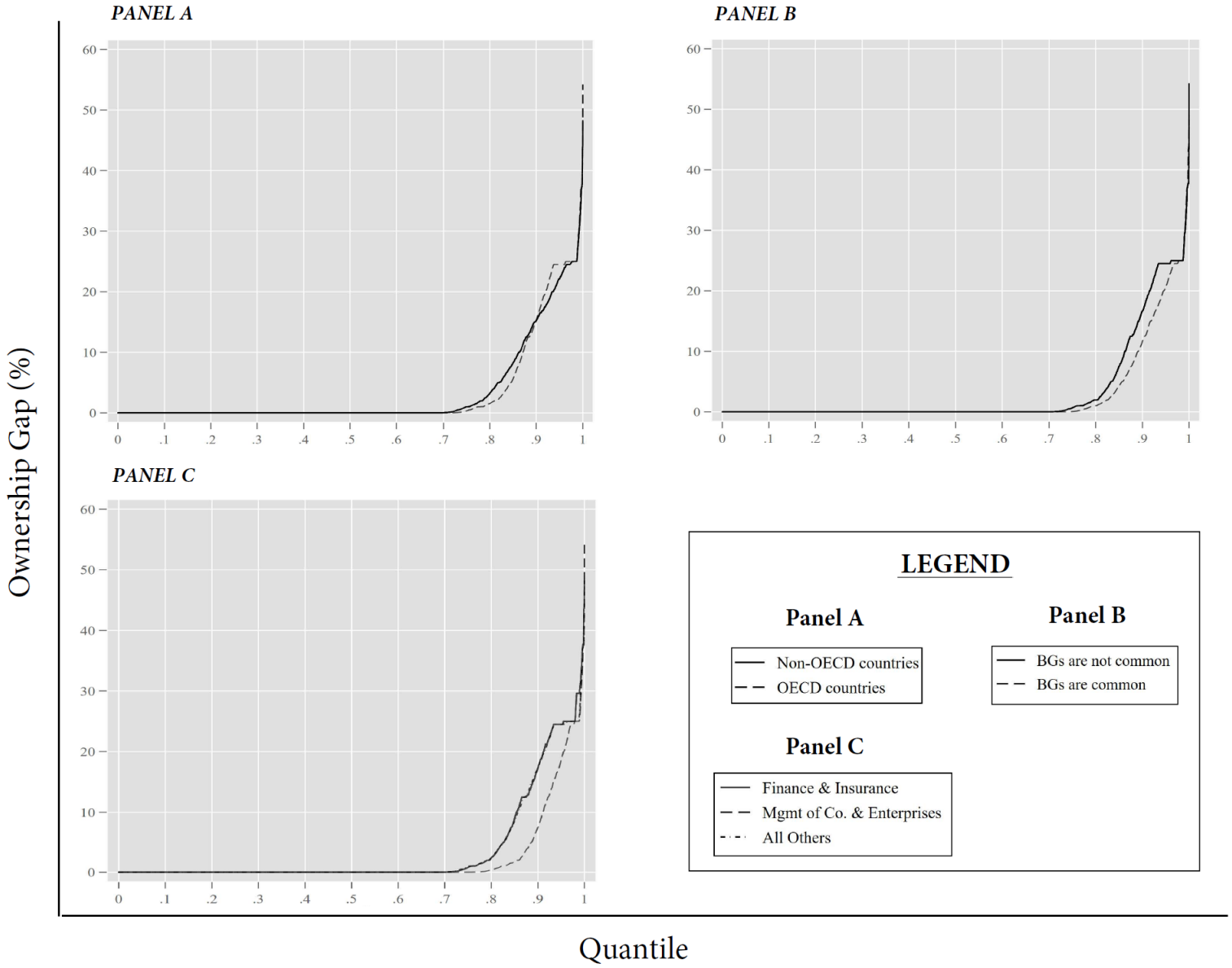

Figure 2.4 - Quantile plot of industrial distance by type of path

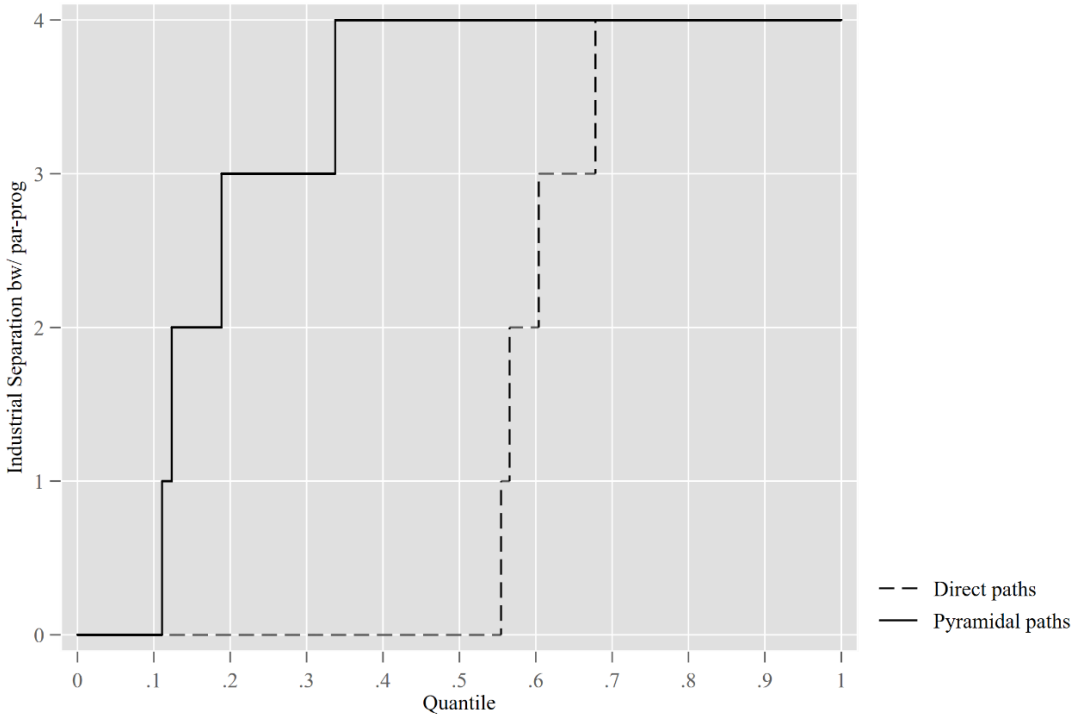

Figure 2.5 - Binned scatterplot of length vs. industrial distance (parent to progeny) – path level

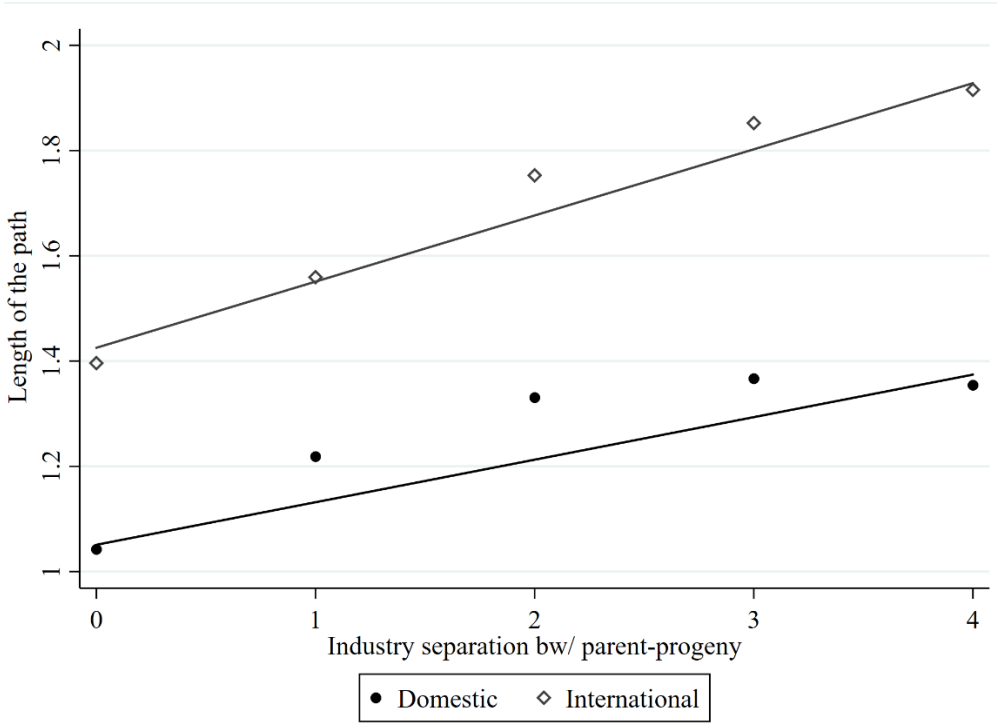

Figure 2.6 - Binned scatterplot of length vs. average industrial distance (each link) – path level

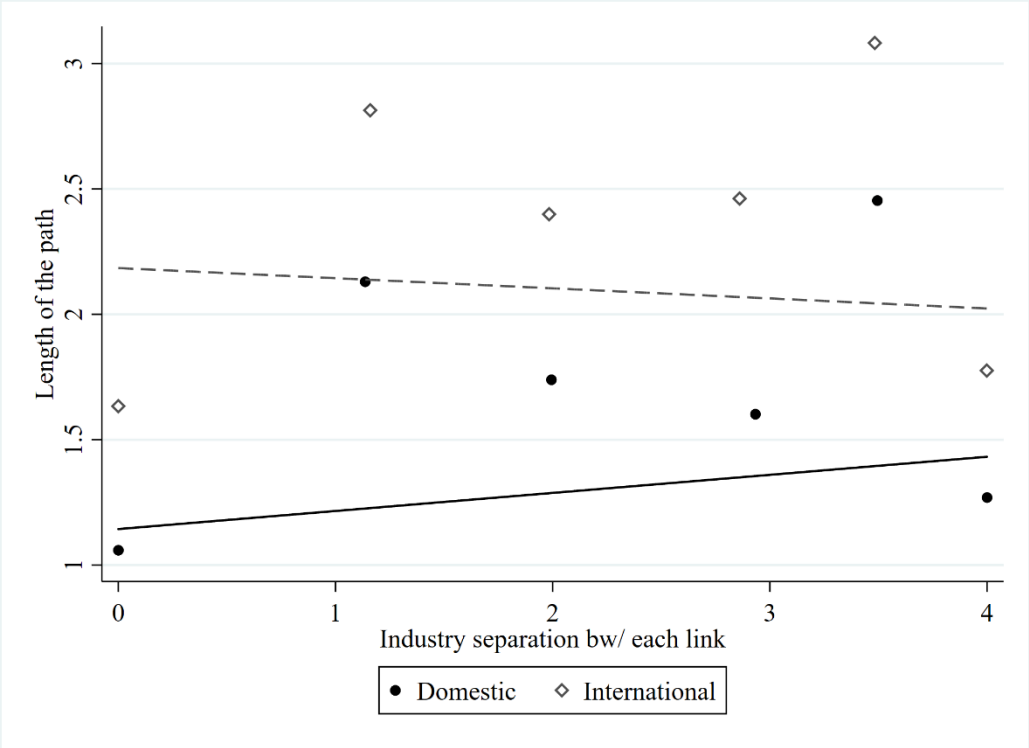

Figure 2.7 - Binned scatterplot of average length vs. average industrial distance (parent to progeny) - firm level

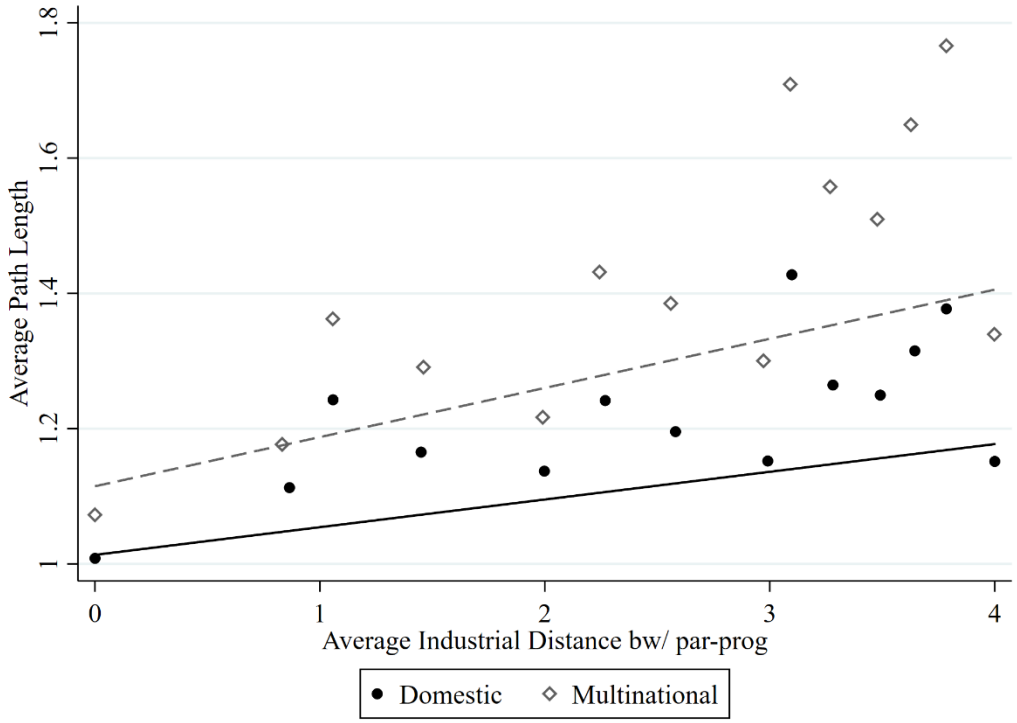

Figure 2.8 - Binned scatterplot of average length vs. average industrial distance (each link) - firm level

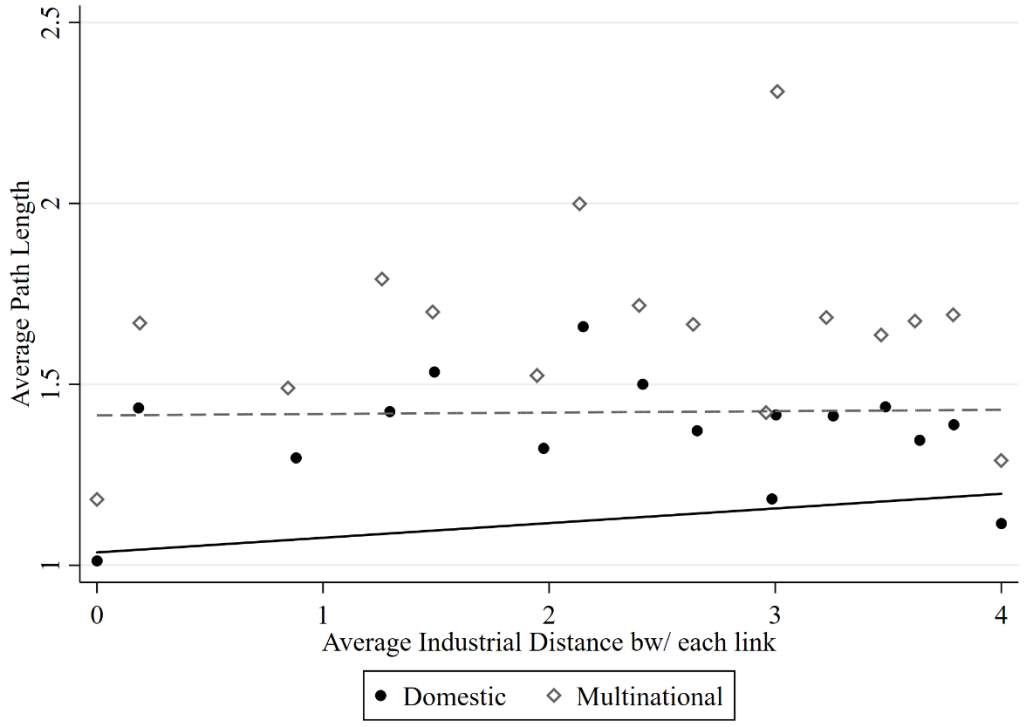

Figure 2.9 - Binned scatterplot of average length vs. diversification breadth - firm level

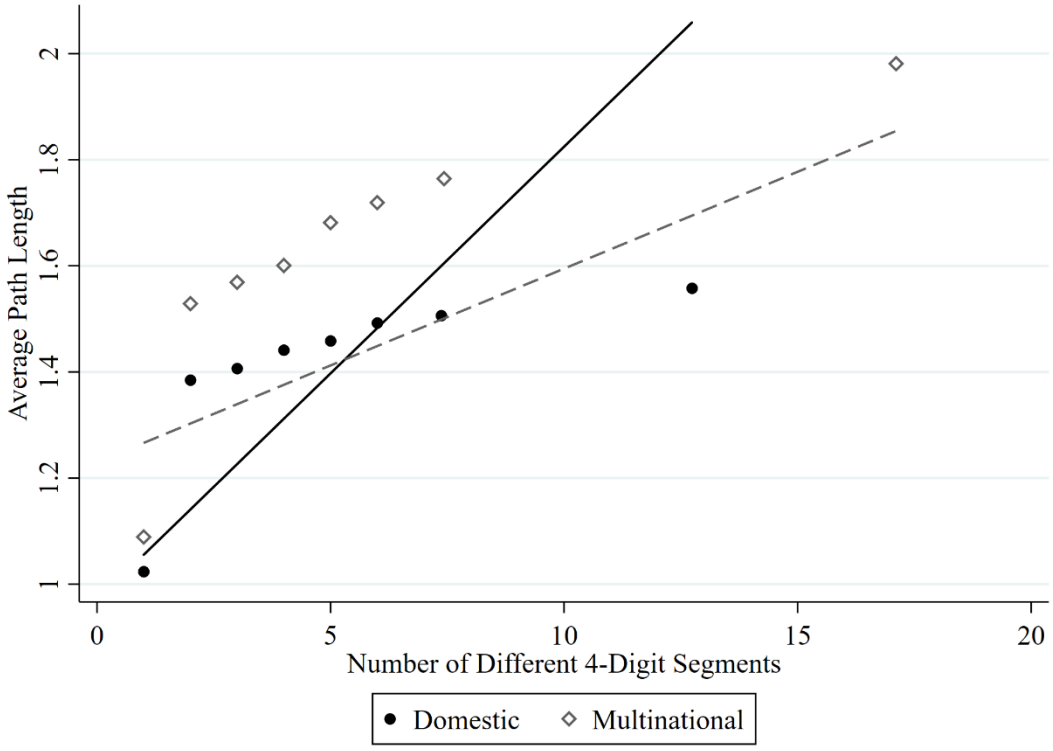

Table 2.7 - Number of unique firms by level

Firm level	N (unique firms)
0 (Parent)	1,176,240
1	2,250,621
2	470,344
3	137,360
4	47,530
5	18,417
6	7,340
7	3,054
8	1,314
9	583
Total	**4,112,803**

Table 2.8 - Number of paths by length

Length of path	Frequency	Percent
1	2,204,733	76.37%
2	470,354	16.29%
3	135,873	4.71%
4	46,744	1.62%
5	17,857	0.62%
6	6,843	0.24%
7	2,781	0.10%
8	1,141	0.04%
9	605	0.02%
Total	**2,886,931**	**100.0%**

Table 2.9 - T-tests with ownership path data

		Paired t-test				
		N	**Direct paths**	**Pyramidal paths**	Difference	*p-value*
Two-sample w/ unequal Var.	*N*		1,602,463	328,211		
	Avg. Ind. Dist. (Par-Prog)	1,964,748	1.598	3.23	**1.642**	0.00
	Avg. Ind. Dist. (Each link)	1,930,674	1.598	2.698	**1.1**	0.00
	Difference		**0**	**0.531**		
	p-value		1.00	0.00		

Table 2.10 - T-tests with firm level data

PANEL A: *(Un)Relatedness of Diversification*

		Paired t-test				
		N	**"Tall" firms**	**Perfectly flat firms**	Difference	*p-value*
Two-sample w/ unequal Var.	*N*		93,532	808,633		
	Avg. Ind. Dist. (Par-Progs)	905,617	3.198	1.287	**1.911**	0.00
	Avg. Ind. Dist. (Each link)	938,525	2.805	1.287	**1.518**	0.00
	Difference		**0.393**	**0**		
	p-value		0.00	1.00		

PANEL B: *Other t-tests*

		N	**"Tall" firms**	**Perfectly flat firms**	Difference	*p-value*
Two-sample w/ unequal Var.	**Number of 4-dig. Segments**	1,176,240	3.722	1.183	**2.539**	0.00

Table 2.11 - OLS regressions with clustered SE – ownership path level

VARIABLES	(1) Length of Path	(2) Length of Path	(3) Length of Path
Industrial Dist. (Par-Prog)	0.046*** (0.002)	0.035*** (0.002)	0.026*** (0.002)
International		0.518*** (0.015)	0.326*** (0.016)
Ind. Dist. x Intl'			0.067*** (0.004)
Parent Industry FE	Y	Y	Y
Progeny Industry FE	Y	Y	Y
Parent Country FE	Y	Y	Y
Progeny Country FE	Y	Y	Y
Observations	1,964,748	1,964,748	1,964,748
Adjusted R-squared	0.177	0.216	0.218

Clustered standard errors by UO in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2.12 - OLS regressions with cluster SE - firm level

VARIABLES	(1) Avg. Length	(2) Avg. Length	(3) Avg. Length	(4) Avg. Length	(5) Avg. Length	(6) Avg. Length	(7) Avg. Length	(8) Avg. Length	(9) Avg. Length
Number of 4-Dig. Segments	0.047***		0.047***	0.043***	0.072***	0.043***	0.073***	0.018***	0.032***
	(0.001)		(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.006)
Avg. Ind. Dist. Par-Sub		0.026***	0.018***	0.015***	0.013***	0.012***	0.008***	0.013***	0.007***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.002)
MNE				0.128***	0.205***	0.046***	0.104***	0.103***	0.096***
				(0.003)	(0.006)	(0.003)	(0.005)	(0.006)	(0.013)
4-Dig. Segments x MNE					-0.039***		-0.040***		-0.015***
					(0.003)		(0.003)		(0.006)
Ind. Dist. x MNE						0.029***	0.038***		0.016***
						(0.001)	(0.001)		(0.003)
Industry Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y
Country Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y
Control for Firm Assets	N	N	N	N	N	N	N	Y	Y
Observations	945,088	905,617	905,617	905,617	905,617	905,617	905,617	40,797	40,797
Adjusted R-squared	0.207	0.133	0.217	0.228	0.238	0.229	0.240	0.165	0.169

Clustered standard errors by UO in parentheses

*** p<0.01, ** p<0.05, * p<0.1

2.11 Appendix

Table 2.A13 - Regression table with categorical variables for robustness check of path level analysis

VARIABLES	(1) Length of Path	(2) Length of Path	(3) Length of Path
Ind. Dist. = 1	0.121***	0.070***	0.070***
	(0.015)	(0.014)	(0.014)
Ind. Dist. = 2	0.185***	0.147***	0.133***
	(0.019)	(0.018)	(0.018)
Ind. Dist. = 3	0.175***	0.133***	0.109***
	(0.010)	(0.010)	(0.011)
Ind. Dist. = 4	0.192***	0.146***	0.106***
	(0.007)	(0.007)	(0.007)
International		0.516***	0.311***
		(0.015)	(0.015)
Ind. Dist. = 1 x Intl'			0.111***
			(0.038)
Ind. Dist. = 2 x Intl'			0.165***
			(0.041)
Ind. Dist. = 3 x Intl'			0.204***
			(0.026)
Ind. Dist. = 4 x Intl'			0.284***
			(0.017)
Parent Industry FE	Y	Y	Y
Progeny Industry FE	Y	Y	Y
Parent Country FE	Y	Y	Y
Progeny Country FE	Y	Y	Y
Observations	1,964,748	1,964,748	1,964,748
Adjusted R-squared	0.178	0.217	0.219

Clustered standard errors by UO in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2.A14 - Regression table with binned variables for robustness check of firm level analysis

VARIABLES	(1) Avg. Length	(2) Avg. Length	(3) Avg. Length	(4) Avg. Length	(5) Avg. Length	(6) Avg. Length
Number of 4-dig Segments						
Medium Diversification	0.263***	0.253***	0.262***	0.253***	0.136***	0.138***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)	(0.009)
High Diversification	0.388***	0.311***	0.385***	0.312***	0.240***	0.185***
	(0.003)	(0.004)	(0.003)	(0.004)	(0.006)	(0.008)
Industry Relatedness						
Semi-related Div.	-0.009***	-0.008***	-0.012***	-0.003*	0.005	0.014**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.006)	(0.007)
Unrelated Div.	0.039***	0.041***	0.026***	0.031***	0.049***	0.043***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.005)
MNE	0.122***	0.087***	0.063***	0.050***	0.080***	0.047***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)	(0.007)
Interaction terms						
Medium Diversification x MNE		0.052***		0.048***		0.004
		(0.007)		(0.007)		(0.014)
High Diversification x MNE		0.197***		0.191***		0.101***
		(0.007)		(0.007)		(0.011)
Semi-related Div. x MNE			0.037***	-0.004		-0.019
			(0.005)	(0.005)		(0.011)
Unrelated Div. x MNE			0.091***	0.067***		0.019**
			(0.003)	(0.003)		(0.009)
Industry Fixed Effects	Y	Y	Y	Y	Y	Y
Country Fixed Effects	Y	Y	Y	Y	Y	Y
Control for Firm Assets	N	N	N	N	Y	Y
Observations	945,088	945,088	945,088	945,088	44,676	44,676
Adjusted R-squared	0.229	0.233	0.230	0.234	0.162	0.164

Clustered standard errors by UO in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2.A15 - Path level models excluding finance and management companies

VARIABLES	(1) Length of Path	(2) Length of Path	(3) Length of Path
Industrial Dist (Par-Prog)	0.039***	0.032***	0.025***
	(0.002)	(0.002)	(0.001)
International		0.384***	0.251***
		(0.017)	(0.018)
Ind. Dist x Intl'			0.052***
			(0.005)
Parent Industry FE	Y	Y	Y
Progeny Industry FE	Y	Y	Y
Parent Country FE	Y	Y	Y
Progeny Country FE	Y	Y	Y
Observations	1,494,192	1,494,192	1,494,192
Adjusted R-squared	0.158	0.186	0.188

Clustered standard errors by UO in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2.A16 - Firm level models excluding finance and management companies

VARIABLES	(1) Avg. Length	(2) Avg. Length	(3) Avg. Length	(4) Avg. Length	(5) Avg. Length	(6) Avg. Length	(7) Avg. Length	(8) Avg. Length	(9) Avg. Length
Number of 4-Dig. Segments	0.040***		0.039***	0.037***	0.053***	0.037***	0.054***	0.015***	0.024***
	(0.001)		(0.001)	(0.001)	(0.003)	(0.001)	(0.003)	(0.001)	(0.006)
Avg. Ind. Dist. Par-Sub		0.023***	0.016***	0.015***	0.013***	0.013***	0.011***	0.009***	0.005***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.002)
MNE				0.079***	0.123***	0.040***	0.074***	0.075***	0.074***
				(0.002)	(0.005)	(0.003)	(0.005)	(0.006)	(0.014)
4-Dig. Segments x MNE					-0.023***		-0.024***		-0.010*
					(0.003)		(0.003)		(0.006)
Ind. Dist x MNE						0.016***	0.021***		0.009***
						(0.001)	(0.001)		(0.003)
Industry Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y
Country Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y
Control for Firm Assets	N	N	N	N	N	N	N	Y	Y
Observations	768,196	737,240	737,240	737,240	737,240	737,240	737,240	29,166	29,166
Adjusted R-squared	0.163	0.101	0.174	0.181	0.186	0.181	0.187	0.121	0.123

Clustered standard errors by UO in parentheses

*** p<0.01, ** p<0.05, * p<0.1

CHAPTER 3

The Cost of Being Foreign: Evidence from a Nationally Representative Experiment in the US

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3.1 Introduction

Nationalism, protectionism, and anti-foreign sentiment have played a key role in shaping investment outcomes across borders both in developing and developed countries for decades (Keegan, 1979; Lubinski and Wadhwani, 2020; Stevens, Xie, and Peng, 2016). Anti-foreign sentiment is on the rise and has become part of the "new normal" in developing and developed countries (Evenett, 2019; Norris and Inglehart, 2019; Rodrik, 2018; Semyonov, Raijman, and Gorodzeisky, 2006). In addition to the many examples of public scrutiny of foreign acquisitions that have led public authorities to cancel deals, there is a sense of a growing, widespread anti-foreign sentiment when it comes to acquisitions.

Understanding the public's opinion on—both public and private—economic issues is important in and of itself. Many of the policies relevant to foreign acquisitions, such as trade restrictions, are strongly influenced by public opinion (i.e., public opinion shapes politicians' agendas, which in turn determines public policy) (Burstein, 2003; Hager and Hilbig, 2020). Public opinion can also influence and pressure different stakeholders, directly affecting the negotiated outcomes of

acquisition deals. As an example, in 2008 the Belgian brewery InBev started a friendly negotiation to acquire the American company Anheuser-Busch but was forced to turn its offer into a hostile turnover and to sharply raise its bid after several stakeholders, pressured by public opinion, strongly opposed the deal.[5]

However, other than in explicit investment restrictions and in some cases legal discrimination, we know very little about how anti-foreign sentiment influences the international expansion of firms. In large part, this absence of evidence stems from the fact that scholars have not had a reliable and valid means of measuring these sentiments. Chatterji *et al.* (2016) introduced an approach to measuring anti-foreign sentiment by government officials at the local level in the United States, using experimental survey methods. We extend this approach by examining how citizens perceive foreign acquisitions in their local economies using experimental methods.

We explore and quantify the tension between rational economic choices versus national identity in public opinion. We employ conjoint analysis, a methodology frequently used in marketing (Green and Rao, 1971; Raghavarao, Wiley, and Chitturi, 2010) and political science (Egami and Imai, 2019; Hainmueller, Hopkins, and Yamamoto, 2014), to understand the multidimensional tradeoff that individuals face to express a preference among potential acquirers of a local firm. We present US residents with pairs of acquiring firms looking to buy an American company, while randomizing acquirer and deal characteristics for respondents across the choices. The use of a large, nationally representative sample of the US population enhances the external validity of our study by allowing us to make inferences about anti-foreign sentiment for the US as a whole.

[5] "Anheuser-Busch Agrees to Be Sold to InBev," The New York Times 7/14/2008

Based on 30,100 observations, we estimate the causal effect that each firm characteristic has on the probability of an individual picking one option over the other. In other words, we show how certain firm attributes shape public perception and therefore their overall willingness to support the firm. Thus, we assess the isolated effects of bundled variables when presented to a target audience.

We make four contributions to the literature on mergers and acquisitions (M&As) and the liability of foreignness (henceforth LOF). First, we provide a direct measurement and quantify the effect of anti-foreign sentiment in terms of tradeoffs. We find that, on average, US residents are 16 percentage points (p.p.) less likely to support a foreign firm than a domestic company as the preferred acquirer, everything else held constant. Moreover, we find that, consistent with the literature on cross-national distances (e.g., Berry, Guillén, and Zhou, 2010), countries that are geographically and/or culturally more distant experience a stronger discrimination effect. However, while the direction of the effect of LOF is aligned with the increase in cross-national distances, its magnitude does not increase at the same rate.

Second, we explicitly address the tension arising from rational economic incentives and nationalistic preferences. We quantify the tradeoff necessary to sway people's preferences and find that it is expensive to overcome this discrimination. In our setting, foreign firms would have to pay over U$450 million more (compared to a U$575 million baseline), hire approximately 4,500 additional workers, or not layoff more than 1,200 workers (in a 2,000-employee acquisition) to offset their preference disadvantage against a domestic acquirer.

Third, our work extends the LOF literature by arguing that this phenomenon is considerably more complex than previously believed. When we explore the heterogeneity of LOF across

different types of owners, we find that beyond the discrimination against foreign firms, there is discrimination against companies owned by foreign nationals (Mata and Alves, 2018; Shi, Gao, and Aguilera, 2020), even if those firms are *nominally* domestic. These findings provide new insights to develop an extension of the existing LOF framework that includes an effect that operates at the ownership level, rather than at the country-of-domicile level. Our findings also suggest that our understanding of what constitutes a "foreign" firm might be outdated and in need of revision.

Fourth, we highlight the importance of public opinion in the shaping of institutions and adoption of public policies which are relevant to firm managers when considering an international acquisition. Because of its indirect, harder-to-measure effect on foreign acquisitions, strategy and international business scholars often underestimate the significance of public opinion. However, the general public can influence politicians, institutional investors, board members, and other stakeholders and thus have important effects on firms' strategic decisions. Moreover, understanding the underlying preferences of the population can help us have a better sense of the implicit biases that may affect the judgement of decision-makers.

The paper is organized into seven sections. The next section provides context on how the theoretical construct of LOF has been operationalized, how it has been measured empirically to date, and presents our propositions and hypotheses. The third section details the methodology we followed to conduct our experiment. The fourth and the fifth, respectively, presents the data and the main findings of our empirical work. The sixth section discusses the implications of our findings, and the last section concludes.

3.2 Theory and Previous Literature

An extensive literature examines LOF, i.e., the idea that foreign firms trying to enter a new country are subject to disadvantages relative to domestic firms due to their unfamiliarity with the business environment and the fact that they face discrimination in the host market (Caves, 1996; Hymer, 1970, 1976; Zaheer, 1995). According to Mezias (2002b) and Eden and Miller (2001) LOF has two components: a) the costs of an *unfamiliar environment hazard* (e.g. the fact that law, culture and language may be foreign to a multinational) (Hymer, 1970; Williamson, 1979; Zaheer, 1995); and b) the *discrimination hazard*, which refers to costs associated with the lack of legitimacy in the foreign country; the fact that multinationals face push back due to nationalism (i.e., anti-foreign bias) and local bias; and the fact that, as a consequence of the anti-foreign bias, politicians may ultimately burden multinationals with investment restrictions of all sorts (Vernon, 1977; Zaheer, 1995).

Traditionally, research on the discrimination hazard in global strategy has focused on FDI restrictions (Emery *et al.*, 2000; Gomes-Casseres, 1990), while less attention was paid to nationalism and local bias as a deterrent of foreign investment. The political science literature suggests that overlooking these attributes may restrict our understanding of the economic phenomena. There is evidence that economic nationalism, that is, the "discrimination in favor of one's own nation, carried on as a matter of policy" (Baughn and Yaprak, 1996: 760), is influenced by individual-level characteristics such as personal job insecurity (Mansfield and Mutz, 2009), and sympathy for local producers (Naoi and Kume, 2011). Economic policies, such as trade policy, are often portrayed as possessing low electoral salience and being "hard to decipher" for the average electorate (Guisinger, 2009; Rho and Tomz, 2017), yet individuals who lost their job due to offshoring are, for instance, the most likely to vote against incumbent

candidates—even when compared to other types of job losses (Margalit, 2011). Still, most of this literature investigates economic globalization with the intent of informing trade policy but ignoring the firm-level effects of economic nationalism on foreign direct investment.

Recent research in strategy and international business has been paying increasing attention to nationalism. For instance, Bertrand, Betschinger, and Settles (2016) argue that in a context of economic nationalism, political affinity between the home country (of the acquirer) and the target country (of the acquired) reduces the initial acquisition premium foreign firms pay. Additionally, Zhou and Guillen (2016) affirm that LOF can be divided into three distinct types that corresponds to discrimination costs. By proxying the discrimination costs with political distance, they show that firms that are seeking efficiency, strategic assets, or natural resources in their foreign investments are more impacted by this type of LOF.

More recent papers have also demonstrated the importance of nationalism and local bias by showing how some MNEs were able to exploit nationalism to delegitimize rival MNEs (Lubinski and Wadhwani, 2020), how this sentiment may reinforce the damage caused by military conflicts on the return accrued by acquirers on cross-border acquisitions (Li *et al.*, 2020), and how a higher concentration of immigrants from a given country in a given destination positively affects the profitability of foreign firms from that particular country (Hernandez and Kulchina, 2020). Moreover, there is evidence that firms may be able to use patriotic rhetoric to enhance performance, and that this effect is enhanced when there is a strong nationalist sentiment, but is attenuated with firm involvement in foreign markets (Mohr and Schumacher, 2019). Still, the literature lacks studies directly measuring nationalism and its effects on foreign firms (Mezias, 2002).

3.2.1 National Identity

Given the traditional body of international business and global strategy literature, as well as the growing number of articles studying nationalism, we reach the first proposition of this study, which is that *preferences deriving from national identity will steer individuals towards prioritizing domestic firms.*

Our baseline hypothesis is that, when individuals are presented with the choice of supporting the acquisition of a local firm, they will be more likely to support a domestic rather than a foreign acquirer. Thus, LOF in this context is manifested through the preference of having, for no reason other than its place of origin, a domestic firm as the acquirer. In other words, our baseline hypothesis is:

H1a: Given identical acquisition offers, individuals will prefer domestic firms over foreign firms.

Kostova and Zaheer (1999) frame this trait as a problem of bounded rationality and limited information. As the "legitimizing environment" (i.e., the government, the public, the media, etc.) of the home country has access to arguably less information about the foreign company than it has about local companies, it frequently relies on stereotypes and past experiences to judge, at least initially, the acquirer. Stereotypes could be associated with a general perception of multinationals, companies in a particular industry, or from a particular country (pp. 74), hence leaving a lot of room for speculation about a foreign player.

Moreover, what follows from Kostova and Zaheer's (1999) logic is that LOF is not a binary phenomenon (e.g., foreign vs. domestic firms), but rather a continuous one. That is, some countries are perceived to be "more foreign" than others, and thus MNEs originating from such countries are subject to a larger disadvantage against domestic companies. In fact, management

scholars frequently rely on a variety of distance measures which reasonably proxy attributes such as the difference in knowledge about the local environment and difference in managerial practices (Berry *et al.*, 2010; Ghemawat, 2001; Zaheer, 1995; Zhou and Guillen, 2016). This is evidenced by the plethora of research that uses cultural and institutional distances to explain a wide-range of cross-national business outcomes (e.g., Flores & Aguilera, 2007; Makhoul, Musacchio, & Lazzarini, 2020; Salomon & Wu, 2012).

We thus posit that people's anti-foreign sentiment towards companies from distinct countries will vary according to *how foreign they perceive* them to be. That is, there will be significant heterogeneity in the effect of LOF depending on the country of origin of the acquirer. For instance, the larger cultural and geographic distances—two of the most commonly used distances—the larger we would expect the LOF to be. Hence, we hypothesize:

H1b: Individuals are more likely to prefer an acquiring firm the less distant the country of origin of the acquirer is.

Additionally, individuals may perceive a company to be foreign not only due to the origin of the company itself but also because of the nationality of its owners (Mata and Alves, 2018; Shi *et al.*, 2020). Mata & Alves (2018) find that firms founded by immigrants—especially those from more institutionally distant countries—have a lower rate of survival when compared to firms created by natives. The authors also find that the likelihood of survival increases with work experience in the host country. This implies that the main source of LOF is the "unfamiliarity hazard," which foreign players can overcome by getting acquainted with the rules of the game (Zaheer & Mosakowski 1997). We argue that there is also an anti-foreign sentiment, which is external to companies and foreign owners, and is determined by the zeitgeist of the host country. This anti-

foreign sentiment appears to be long-lasting and harder to overcome (Fouka and Voth, 2016; Sun *et al.,* 2020).

Based on prior studies' findings that the unfamiliarity hazard side of LOF applies not only to firms, but also to individual owners, we hypothesize that foreign ownership can be considered as an alternative measure of foreignness, and thus pose similar disadvantages as the ones faced by nominally foreign companies. That is:

H1c: *Individuals are less likely to prefer an acquiring firm if its owners are foreign nationals.*

3.2.2 Economic Incentives

Still, despite of all the disadvantages MNEs have to endure because of the LOF, the fact remains that foreign acquisitions—both from companies of relatively close and distant countries—indeed happen. One may argue that the reason behind this fact is that international trade—in its many forms—can be economically beneficial. Hence, we reach the second proposition of this study, namely that *economic rationale will steer individuals towards prioritizing the firm that maximizes their economic benefit.*

We thus look at two conditions that could potentially make an acquisition offer more or less attractive to the local population, specifically the offer price and the proposed plan for the labor force. All else being equal, we expect that a higher offer price will have a positive effect on people's preferences of who should acquire the target company. This is because a higher offer price signals that one acquirer values the target company more, and thus can generate more value, than the other (Laamanen, 2007). At the same time, marketing research has long pointed to a strong and general association between price and quality (Gardner, 1971). Put formally:

H2a: Individuals are more likely to prefer an acquiring firm the higher the acquisition bid is.

Similarly, the proposed plan for the labor force in an acquisition (i.e., whether there are going to be layoffs and how severe they would be) can—even more severely—affect the local economy. An offer expanding the labor force in the target company generates immediate value to the local economy through employment opportunities, while an offer with plans for an aggressive layoff may harshly hurt an entire community. Therefore, we hypothesize:

H2b: Individuals are more likely to prefer an acquiring firm the more favorable the acquisition plan is to the local labor force.

As one may notice, the effects of propositions one and two can influence people's preferences in opposite directions. Our point of departure is that individuals prefer an option that maximizes their wealth, *ceteris paribus*. If a foreign firm presents an offer package that is more economically favorable to the local community, individuals will have to weigh how much they care about their national identity versus their community's economic well-being. It is precisely this tradeoff that we seek to quantify in this study. In other words, our empirical setting can give us a sense of how much more would a foreign company have to offer in order to make people indifferent between the foreign and a domestic firm (i.e., how much it 'costs' to be foreign).

3.3 Methodological Approach

We set up an experiment to measure the discrimination hazard portion of LOF more directly. We can do so by using experimental methodologies that allow us to isolate the effect of nationalism and anti-foreign sentiment aimed at specific countries using online surveys distributed in the US. We employ a conjoint analysis methodology to establish causal links through stated preferences (Egami and Imai, 2019; Hainmueller *et al.*, 2014). The use of conjoint analysis allows us to estimate the causal effects of a multidimensional treatment (Shamir and Shamir, 1995), thus

enabling the testing of multiple hypotheses simultaneously—and therefore avoiding one of the issues of field experiments pointed by Chatterji *et al.* (2016), namely that these experiments are very narrowly focused.

3.3.1 Conjoint Analysis

Survey experiments became prominent in different fields of research due to their ability to causally validate relationships that were known to yield statistical correlation in observational studies (Sniderman, 2018). This is true because they rely on randomly distributing subjects across conditions before measuring their attitudes or behavior. Holding everything else constant, subjects in the control condition become counterfactuals of those who were assigned into a treatment group. Thus, any difference in the outcomes can be causally attributable to the treatments.

In brief, a conjoint analysis consists of randomly combining different pre-selected attributes into pairs of profiles and asking subjects which combination they prefer. This methodology is frequently used to understand complex multidimensional choices, as it identifies the relative importance of each individual attribute during the decision-making process. In their response, participants are automatically stating their preferences toward two combinations (e.g., they select combination 1 and they do not select combination 2). These two observations are easily escalated up, since this approach allows respondents to participate in several tasks without diminishing the quality of the response (Bansak *et al.*, 2018). Thus, this generates multiple outcomes per subject (in our case, 10 observations—five tasks, each comparing two acquirers), drastically increasing the sample size without requiring the recruitment of an excessive number of participants (Hainmueller *et al.*, 2014).

After collecting responses from a nationally representative sample, a conjoint analysis permits isolating the effect of each attribute, as if these were different treatment conditions, ultimately, allowing strong internal validity (Cattin and Wittink, 1982; Green and Srinivasan, 1978). The causal identification of conjoint analysis holds under three (fairly innocuous) assumptions: there are no carryover effects between tasks, no profile-order effects, and true randomization of the profiles. For a more detailed explanation, see Hainmueller *et al.* (2014).

3.3.2 Experimental Design[6]

3.3.2.1 Survey Protocol

We ask respondents to choose among two firms that are possible acquirers of a hypothetical US firm and that have variations along four dimensions (country of origin, ownership, offer price, and a proposed plan for the labor force). In each task participants are given the following question with different configurations for the buying firms:

"Now, consider the following hypothetical scenario: American Industries Inc., a local manufacturing company, is going to be sold and has received offers from two potential buyers. Since this is a large company with 2,000 employees, the local government is calling a town hall to consult the population on their preferred buyer. Please indicate which of the two firms you would personally prefer to support as buyer of American Industries Inc."

We randomize these four acquirer characteristics from within five options. This design choice gives us a total of 625 (5 x 5 x 5 x 5 = 625) possible combinations (the matrix of randomized characteristics is presented in Table 1). We illustrate the randomization process in Figure 1, by

[6] Before fielding the experiment, we have pre-registered our theoretical expectations and methodological procedures at the Evidence in Governance and Politics platform (EGAP).

depicting one of the possible choices a subject is expected to make. Since we collect a large number of observations, it is possible to isolate the impact of each of these randomized attributes on the choice of acquirers respondents make. In that way, our results allow robust causal inference (Hainmueller *et al.*, 2014).

We follow Hainmueller *et al.* (2014) and ask respondents to answer each set of choices in two ways. First, they are asked to choose between the two (fully randomized) firms that were introduced. This action generates two binary observations, where 1 means that the firm was chosen and 0 means that it was not. To illustrate this, consider that a subject prefers Firm 1 in the example shown in Figure 1. In this case, the survey generates an observation with the value 1 for the combined attributes presented for Firm 1 and 0 for the combination in Firm 2. The second framework involves continuous responses, as shown in Figure 2. Here, we ask respondents to state how much they would prefer each of the two firms based on a 0-10 scale.

3.3.2.2 Empirical Strategy

In our setting, by observing the respondents' choice given the characteristics randomly presented to them, we can make causal inferences on the impact of each variable on the average decision-making process of the subjects. What is interesting here is that we are able to observe how individuals deal with tradeoffs in their preferences (Shamir and Shamir, 1995). For example, an individual may prefer, *ceteris paribus*, that a US company acquires the target American firm rather than any foreign firm (i.e., we can find a simple confirmation of the LOF hypothesis). Yet, we can also see if the preference for local firms is different according to the nationality of the foreign firm. More interestingly, our experimental survey design allows us to measure the "price of being foreign". That is, we can roughly estimate how much more a foreign company has to

pay to overcome the discrimination bias given the conditions proposed in this experiment.[7] We also repeat this exercise by varying the acquirers' proposed plan for the target firm's labor force (i.e., layoff or hire more/less employees). Thus, the experiment allows us to quantify the LOF in multiple dimensions.

The resulting data from the survey is analyzed based on the average marginal component effect (AMCE) (Hainmueller *et al.*, 2014). Consider the binary dependent variable where 1 means that the firm was selected. The Linear Probability Model (LPM) is built by regressing this dependent variable on each of the categorical variables that represent each dimension of the study (country of origin, offer price, labor force, and ownership type). The analysis of the results is straightforward: the coefficient of each attribute of a categorical variable is the average marginal component effect of this attribute compared to the baseline option of the variable. Since each respondent generates 10 observations, standard errors are clustered at the respondent level. The same approach is used for the continuous dependent variable, which ranges between 0 and 10.

To be clear, given that our particular focus is on public opinion rather than individual preferences, we are not interested in how the responses vary for each subject (within-subject effects). This approach would require a smaller set of attributes in the choice model, so that each respondent would be exposed to all variations in acquiring firm characteristics. Yet, our research goal is to assess how the American public (in the aggregate) is influenced by different factors involved in the acquisition of domestic firms. This justifies our operationalization prioritizing the analysis of between-subject effects.

[7] Our setting describes a company with 2,000 employees and features offers ranging from $500 million to $650 million. We acknowledge that a change in these settings could significantly alter the results.

3.3.2.3 Country Selection

One fundamental decision we had to make was to select the countries of origin of the hypothetical acquiring firms. We wanted to have geographic proximity as well as cases that are geographically distant, and we wanted to have countries that were either culturally close or distant to the United States. We, therefore, included four countries that had low/high geographical and cultural distances, as depicted in Figure 3. We thus ended up choosing Mexico (low geographic distance, high cultural distance), China (high, high), Australia (high, low), and Canada (low, low). We calculated the geographic distance between two countries using the "measure distance" feature of Google Maps (using the center of each country as start/end points). For cultural distance, we follow the measure pioneered by Kogut and Singh (1988).

We hypothesize that both geographic and cultural distances should be positively correlated with anti-foreign sentiment. Therefore, as an example, we expect Canadian companies, which have both low geographic and cultural distances to the US, to experience a lower anti-foreign sentiment compared to Chinese companies, which have larger distances to the US.

Part of what we want to show with our methodological approach is that anti-foreign sentiment goes beyond cross-national distances. Thus, we purposely include China and Mexico in the choice set because they are specially discriminated against in the United States. A portion of the effect that we uncover are certainly attributable to this idiosyncratic sentiment, which lead us to argue that cross-national distances are an incomplete proxy for LOF.

3.4 Data

We conduct our survey using an academic-oriented platform called Lucid Theorem, which allow us to obtain a nationally representative sample of 3,010 US residents, generating a total of 30,100

observations. Lucid Theorem targets individuals who share the same demographic distribution of the American public (i.e., ethnicity, age, income, and region) (Coppock and McClellan, 2019). Furthermore, Coppock and McClellan (2019) also conclude that studies conducted with pools of respondents from Lucid Theorem lead to similar results as those based on the American National Election Study (ANES), the most reputable survey data in the field of political science. Finally, Lucid Theorem uses techniques that inhibit fraudulent behavior that may be encountered in platforms like Amazon's Mechanical Turk, such as the use of bots (automated programs) and random answers, which possibly hinders the reliability of scholarly work that does not actively address these issues (Chmielewski and Kucker, 2020).

3.4.1 Dependent Variables

The dependent variables of this study are the choices between a random pair of possible acquirers (a binary choice, as depicted in Figure 1), and the rating in a scale of 0-10 that participants give to each of these same possible acquirers (continuous measure, as depicted in Figure 2). We conduct our main analyses using the binary variable, as it provides an easier translation of the coefficients to a meaningful scale and use the continuous variable as a robustness check.

3.4.2 Explanatory Variables

The main variables of interest are the randomized characteristics of the possible acquirers, as shown in Table 1. Each of the dimensions (i.e., country, price, labor force, and ownership) receive a value from 0-4, which corresponds to one of the five options for each dimension, depending on the options shown for each task. To illustrate this, in the example shown in Figure 1, the country dimension in the observation corresponding to "Firm 2" takes the value of 0, which is the value assigned when the origin country is the United States. The use of categorical

variables is effectively the same as creating separate dummies for each option and assigning values of 1 or 0 if they are displayed or not.

In addition to the categories, we also create a dummy variable which captures if the possible acquirer is foreign (1 if the firm is from the US and 0 otherwise). This variable is intended to measure the overall effect of the anti-foreign sentiment. Furthermore, we create a continuous variable for the offer price using the values in Table 1—which takes the value of the displayed offer price option in millions of dollars, and for the proposed plan for labor force, in which a reduction in the number of employees is coded as a negative value and the recruitment of new workers corresponds to a positive value.

3.5 Results

We divide our result section into sub-sections dedicated to presenting each set of results we get from both our *a priori* theorization and *post-hoc* analysis. We also include a sub-section describing the robustness checks we performed, which are available from the authors upon request.

3.5.1 Baseline Analyses

In Table 2 we show the results of our baseline hypothesis. Model (1) shows the effect of being foreign on the likelihood that an individual pick a company as their preferred acquirer for the acquisition of our hypothetical target company, "American Industries Inc." Holding everything else constant, we find a negative anti-foreign effect of 15.8 p.p. ($p<0.001$) in the probability of being chosen as the preferred acquired. As mentioned before, conjoint analysis allows us to independently estimate the causal effect of each characteristic in the probability of picking an option over the other. This is shown in model (5), in which the inclusion of all other

characteristics leaves the coefficient of foreignness—as well as all others—largely unchanged from when they are introduced one at a time. Therefore, we find strong support for hypothesis *H1a*.

Table 2 also shows the results of our analysis on the effect of a larger acquisition offer price on individuals' preference for an acquirer. Model (2) introduces the continuous variable capturing the acquisition bid (in millions of US dollars) in addition to the foreign dummy variable. We find that for each additional US$1 million in the offer price, individuals are 0.034 p.p. ($p<0.001$) more likely to pick the firm as their preferred acquirer. It is worth noting that, in our setting, the median bid was US$575 million, so an additional 1 million dollars represent an increase of roughly 0.17% in the offer price. We thus find significant support for hypothesis *H2a* as well.

We conduct a similar exercise with the effect of proposed plan for labor force in model (3) of Table 2. Like with the acquisition bid, we use the continuous variable for proposed change in labor force. Our results once again show strong support to our hypothesis (*H2b*), where we find an effect of 0.008 p.p. ($p<0.001$) in the probability of favoring an acquirer over another for every worker that is not laid off (firing less employees) or brought into the company (hiring more employees). In our setting, the median plan was to maintain all the 2,000 employees of the target firm.

3.5.2 Heterogeneity of LOF

3.5.2.1 Country of Origin

As mentioned earlier in the article, we are also interested in unbundling the effect of foreignness to show that the anti-foreign discrimination is not a dichotomous effect, but a continuous one. To that end, we include the individual effect of each origin country (against the baseline of a

domestic firm) in the likelihood that an individual chooses the company as the preferred acquirer. Table 3 shows the results of this exercise. In the first column we show the effect of each foreign country contemplated in our study. We find that, compared to a US firm, Canadian firms are 9.4 p.p. ($p<0.001$) less likely to be picked as the preferred acquirer, while Australian, Mexican, and Chinese firms are 12.4 p.p., 14.6 p.p., and 26.4 p.p. (all at $p<0.001$) less likely to be chosen, respectively.

We then test if these coefficients are statistically different from each other. More specifically, we test the effect of geographical distance, while holding constant the cultural distance, and *vice-versa*. Panel A of Table 3 shows the results of the first test, i.e., changing geographical distance in both high and low cultural distance contexts. We find a significant difference between the negative effect of both Canada and Australia and Mexico and China, with magnitudes of 3 p.p. and 12 p.p. ($p<0.001$), respectively. Meanwhile, Panel B shows the effect of varying cultural distance while holding constant (high and low) geographical distance. Once again, we find a 5 p.p. ($p<0.001$) difference in the negative effects of Canada and Mexico and a 14 p.p. ($p<0.001$) difference in the effects of Australia and China. These cohesive findings provide abundant support to our hypothesis *H1b*.

3.5.2.2 Effect of ownership

As shown in Table 1, one of the dimensions that are part of the randomization in our conjoint analysis is who owns the potential acquirers. Although our ownership hypothesis focused on foreign owners, we also estimate the effect of family, employee (cooperatives), and state ownership. In Table 2, we can see that, compared to a firm owned by American (native) investors, individuals are 12 p.p. ($p<0.001$) less likely to support a firm as the preferred acquirer if the firm is owned by foreign investors, in line with our hypothesis *H1c*. We also find a

reduction of 10 p.p. ($p<0.001$) in the likelihood of support if the firm is state-owned. We find no significant change for family ownership, and a surprising increase of 2.3 p.p. ($p<0.02$) in the likelihood of support if the firm is a cooperative.

Furthermore, we split our sample into domestic acquirers (firms domiciled in the US) and foreign acquirers and graphically show the effect of having different types of owners in the likelihood that an individual favors a given acquirer. Figure 4 shows these two plots side by side, where the left-hand side illustrates the results for domestic acquirers and the right-hand side the results for foreign ones.

Our empirical exercise shows that, compared to the baseline of a firm owned by multiple American investors, individuals are 14.4 p.p. and 10.8 p.p. (both at $p<0.001$) for domestic and foreign firms, respectively, less likely to favor a potential acquirer if they are owned instead by multiple foreign investors. Additionally, we also find that individuals are 10.6 p.p., for domestic, and 9.7 p.p., for foreign (both at $p<0.001$), less likely to pick an acquirer if they are state-owned. Family ownership and employee-owned firms show no significant effect compared to American owners.

3.5.3 Additional Analyses

3.5.3.1 Non-linearity of labor force

We consider the possibility that individuals may be loss-averse (Tversky and Kahneman, 1991) when confronted with different plans for the target firm's labor force, as our setting has a clear reference point (making no changes in the workforce). That means individuals may be more sensitive to a loss than to a gain (Tversky and Kahneman, 1979). In Figure 5 we show that this is true in our setting as well. Individuals place a significant larger value in "sparing" an employee

than in hiring an additional worker. In fact, we find a 72.7% ($p<0.001$) reduction in the positive effect of labor force in the likelihood that an individual favors a given firm when we segment between not firing (change in labor force is less negative) and hiring (change in labor force is ≥ 0).

3.5.4 Robustness Checks

To check the robustness of our results, we run all our empirical exercises using the continuous dependent variable described in the data section and find that the results remain largely unchanged. All of the coefficients remain in the same direction and essentially maintain their significance level. One exception for this is the coefficient associated with an increase in the offer price, which loses its significance. Our analysis of the non-dichotomous effect of LOF is also largely consistent to this alternative dependent variable. With the exception of the difference between the effects of Canada and Australia (varying geographical distance while holding constant low cultural distance), all other effects were significant and in the same expected direction.

3.6 Discussion

The results of our empirical analyses largely confirm the idea that when you ask individuals to state their preference among potential acquirers of a domestic firm, foreign firms are at a disadvantage against domestic firms, in line with the findings of the literature on LOF. Notwithstanding, our empirical exercise explicitly focuses on the discrimination hazard part of LOF—and measures it directly, whereas previous studies have usually focused on disadvantages brought on by the unfamiliarity with the host environment. We find a baseline effect that individuals are 16 p.p. less likely to favor an acquirer if the acquirer is foreign.

Additionally, in line with what one would expect, we find that people favor those acquirers that bring them superior economic benefits. Our results show that, to increase the chance of being chosen as the preferred acquirer by 1 p.p., firms would have to offer about $29 million dollars more (than the competing acquirer) for the target firm (considering a median offer price of $575M); layoff about 78 less employees; or hire almost 290 additional employees (in a 2,000-employee firm).

These figures tell us something interesting about the tradeoff individuals make between different offer bids and different plans for labor. When thinking about which firms to support in an acquisition of a local firm, individuals consider the non-dismissal of a worker as the equivalent of an increase in the offer price of $371,000 dollars. At the same time, they value the hiring of an additional employee as the equivalent of an extra $100,000 dollars in the offer price.

More importantly (for the purposes of this study), the two distinct preferences (i.e., national identity and economic incentives) can be conflicting, potentially forcing a tradeoff between choosing a domestic firm and maximizing economic benefits. Our results show that to even the playfield between foreign and domestic acquirers, the former would have to offer $450 million dollars more for the target company, layoff 1,218 less employees, or hire 4,470 more workers.[8] In other words, overcoming the disadvantages brought on by anti-foreign sentiment is very hard and expensive. In a setting where the average bid is $575 million and the target firm employs 2,000 workers, overcoming the anti-foreign sentiment in these terms would require the foreign

[8] These values were calculated by dividing the coefficients by one another. For instance, to reach the value of $450 million dollars required to offset the LOF, we divided the (absolute) coefficient of anti-foreign sentiment by the coefficient of price, i.e., $\frac{0.156}{0.000346} = 450.867$.

firm to bid 80% higher, to not dismiss 60% of the workforce or to more than triple the size of the labor force.

Another important finding of our study is that the discrimination hazard part of LOF is not simply a binary variable. While we find that the aggregated anti-foreign effect changes the likelihood of being the selected acquirer by -16 p.p., our results show that once we partition this effect by country of origin, the likelihood varies from -9 p.p. for Canada to -26 p.p. for China, with a coefficient closer to -14 p.p. for Mexico and Australia. This finding is consistent with the literature on LOF and cross-national distances as well.

While our results confirm the validity of distances as proxies for LOF—i.e., larger cross-national distances are associated with a more severe effect of LOF—they also indicate that researchers should be careful when using such proxies as the interpretation of magnitudes may not be reliable measures of anti-foreign sentiment. Take for instance the case of cultural distance. We find that there is a difference of 5 p.p. between Mexico and Canada in the effect of LOF. At the same time, we find a difference of 14 p.p.—almost three times more—between China and Australia. While it is true that both Mexico and China are considerably more distant to the US in terms of culture than Canada and Australia, the difference between Canada and Mexico is about three times larger than the difference between China and Australia. Also, while our evidence points to the fact that cultural distance seems to matter more than geographical distance, Chinese companies have a disadvantage almost twice as large relative to that of Mexican firms, despite the fact that Mexico is about 150% more culturally distant to the US than China.

Moving on, our study also contemplates some analysis on the complexity and heterogeneity of the discrimination hazard component of LOF. The discriminatory effects experienced by foreign

companies are not the same for different firms or for different owners. We have demonstrated this heterogeneity before by showing that the magnitude of the anti-foreign sentiment varies depending on the company's country of origin. Further examining this issue, we show that even for companies from the same country, it is possible that firms with different ownership configurations may experience different levels of discrimination. For instance, our results show that foreign firms owned by their home country's government would have to either hire or not layoff over 1,000 additional workers to be preferred over a foreign employee-owned firm.

We also find that there is an anti-foreign bias when it comes to domestic companies owned by foreign nationals. This result is consistent with the idea of Mata and Alves (2018) that LOF applies also to individuals, not only to firms. Whereas Mata and Alves show that foreign individuals may be subject to the unfamiliar environment hazard side of LOF, we find that this is also true for the discrimination hazard side. For instance, companies domiciled in the US that are owned by foreign investors have to offer $644 million dollars more than a domestic firm owned by American investors to offset that anti-foreign bias (based on a median offer price of $575 million).

This finding, which recent studies on the effect of foreign institutional ownership seem to corroborate (Shi *et al.*, 2020), has a profound theoretical and practical impact on the study of LOF. The literature on LOF has, for obvious reasons, focused on multinational (foreign) companies. As the nature of ownership has changed significantly in the past decades, what is meant by a "foreign" company is not straightforward. Traditionally, a foreign company would be thought as a firm whose headquarters and main operations are domiciled abroad. That firm may even have large operations and own subsidiaries in the host country, but its origins and control structures would be abroad. However, the question of whether a parent firm (i.e., not a

subsidiary) that is headquartered in a given country but owned by foreign investors can be considered as a foreign firm is a gray area. Our results indicate that firms domiciled in the US but mainly owned by foreigners can experience an anti-foreign sentiment similar to what 'traditional' multinationals face, something that points to the heightened complexity of LOF and the need for more detailed theoretical and empirical studies that take into account ownership structures (Aguilera, Marano, and Haxhi, 2019).

Lastly, we find it important to discuss the implications of running our analysis at the individual level and with "common people" (i.e., American residents). Strategy and international business research have traditionally focused on macro-level units of analysis (such as companies, industries, or countries) that have effects on firms that are easier to map and theorize about. Additionally, management scholars that study international investments have usually focused their attention on groups that have *de jure* power to influence these affairs, such as legislators, regulators, and public officials, in detriment of the general population. Although we agree that the aforementioned settings should be studied, we see the necessity of taking a step back and understanding the underlying preferences of the population, who are ultimately stakeholders (i.e., consumers and employees) and constituents who vote for the politicians that enact those regulatory changes. Moreover, decision-makers are also part of the public, and quite possibly subject to the same underlying biases as other citizens.

The most obvious way in which public opinion affects decision making in the political sphere is through issue salience. That is, when certain political topics become relevant among voters, elected officials tend to be influenced by public opinion when shaping their political narratives (Hager and Hilbig, 2020) and making policy decisions (Knecht and Weatherford, 2006). In that sense, voters influence the party's positions (Monroe, 1983), organize around policy-oriented

voluntary associations (Bevan and Rasmussen, 2020), and elect politicians with congruent preferences (Wlezien, 2017; Wlezien and Soroka, 2012). Indirectly, public opinion tends to be strong enough to influence even judicial decisions (Calvin, Collins, and Eshbaugh-Soha, 2011).

A recent turn in politics in Europe and the United States (as in other places like the Philippines, Brazil, or Mexico) highlight that studying the preferences of educated or political elites may not be enough to understand whether important variables such as openness to trade and investment will change (Feng, Kerner, and Sumner, 2019). Public opinion is shifting rapidly because voters have preferences that sometimes are at odds with the sophisticated models that elites use to understand the advantages and disadvantages of foreign trade and investment. Even though elites may influence voter attitudes (Zaller, 1992), public opinion is a core determinant of policy making (Burstein, 2003). Ignoring individual preferences as determinants of larger, macro institutional variables can blur our understanding of current anti-globalization efforts by nationalist politicians.

3.7 Conclusion

In this study we conduct a comprehensive investigation on the disadvantages faced by foreign firms, in the context of M&As, in the public opinion of a representative sample of US residents. We do so by conducting an online experiment with a large, nationally representative sample of US residents.

Our findings advance the scholarship of global strategy and international business in four ways. Firstly, using a direct measurement for economic nationalism, we broadly confirm the traditional view that foreign firms operating abroad encounter significant resistance when compared to domestic firms. Secondly, we address and quantify the tension between nationalistic preferences

and economic incentives. We show that foreign firms are in theory able to overcome their disadvantage by offering more favorable deal conditions to the target company, but find that it is unlikely that a foreign firm would be able to overcome the discriminatory effect against it by 'sweetening the deal.' Thirdly, we refine the study of the discrimination hazard side of LOF by exploring sources of its heterogeneity. We investigate how the discriminatory effect against foreign companies can vary across firms within the same group (i.e., country of origin) depending on who owns them. We find that, in fact, domestic companies that are owned by foreign investors (instead of American ones) are also targets of anti-foreign sentiment, suggesting that LOF does not apply only to firms, but to individuals as well.

Lastly, our paper focuses on public opinion, an often-neglected dimension in the global strategy and international business literatures. Understanding how the local population feel about foreign acquisitions can be quite important to managers when planning their international expansions and when entering negotiations to acquire a foreign company. As the example of InBev illustrates, public pushback can strongly influence the outcome of an acquisition, for example by raising its price or even by motivating politicians to implement institutional change.

Our analyses on the discrimination hazard side of LOF point to the fact that this phenomenon is considerably more complex than previously theorized. We thus see several possible avenues—as well as the necessity—for future research on the topic. Future research should include a systematic and broad investigation of the relationship between cross-national distances and anti-foreign sentiment. We also see the need for further examination of the effect of public opinion on actual policy decisions and business outcomes. Additionally, we believe the field would benefit from a didactic understanding on how actors such as politicians, firms, or the media, can influence and sway public perception in ways that benefit their own agendas. Lastly, future

studies could go even further in analyzing how different demographics, individual preferences, and backgrounds can systematically alter people's opinions on foreign investors.

We also propose that special attention should be given to the fact that anti-foreign sentiment, usually attributed to a firm being originally from another country, is not restricted to firms domiciled abroad. We thus see the need to i) revisit our definitions of what constitutes a multinational company; and ii) update our understanding of LOF to accommodate the fact that the core issue of discrimination seems to regard not the origin of the company, but rather the origin of the owners (i.e., this seems to be an individual level rather than a firm level issue).

Finally, there is vast empirical evidence showing that multinationals can overcome the unfamiliarity hazard as they gain experience in the local market and are able to mimic the practices of local competitors, eventually closing the informational gap (Kogut, 1991; Mezias, 2002; Wu & Salomon, 2016; Zaheer & Mosakowski, 1997). In contrast, recent research has found a long-lasting and significant impact of 'cultural aversion' (i.e., anti-foreign sentiment) on the sales performance of foreign products (Fouka and Voth, 2016; Sun *et al.*, 2020), suggesting that discrimination hazards may have significant and enduring effects. Furthermore, as rapidly changing policies emerge with the rise of nationalism and populism, these more 'static' challenges brought on by unfamiliarity hazards are likely to take a secondary place (Rodrik, 2018). Thus, we believe it is important that strategy and international business scholars devote significant attention to this burgeoning topic of nationalism and how it affects the business environment for multinationals.

3.8 Tables and Figures

Table 3.17- Choice matrix

	Possible variations				
Amount offered for American Inc.	$500 million	$537 million	$575 million	$612 million	$650 million
Proposed plan for labor force	Fire 1,900 employees	Fire 1,000 employees	Keep all 2,000 employees	Recruit 1,000 additional employees	Recruit 2,000 additional employees
Buyer is from	US	Canada	Australia	Mexico	China
Buyer is owned by	Multiple Americans	A family	Multiple foreigners	Its employees	The government

Table 3.18 - Baseline Estimations of the Probability of Choosing a Firm as the Acquirer

VARIABLES	(1) DV is binary	(2) DV is binary	(3) DV is binary	(4) DV is binary	(5) DV is binary
Foreign	-0.158***	-0.159***	-0.156***	-0.159***	-0.157***
	[0.00727]	[0.00727]	[0.00708]	[0.00723]	[0.00706]
Price		0.000344***			0.000347***
		[5.32e-05]			[5.18e-05]
Labor force			8.02e-05***		8.02e-05***
			[2.30e-06]		[2.30e-06]
Family-owned				-0.00143	-0.00362
				[0.00924]	[0.00895]
Foreign investors				-0.116***	-0.116***
				[0.00927]	[0.00902]
Cooperative				0.0230**	0.0224**
				[0.00926]	[0.00897]
State-owned				-0.0966***	-0.0989***
				[0.00910]	[0.00889]
Observations	30,100	30,100	30,100	30,100	30,100
Adjusted R-squared	0.016	0.017	0.066	0.029	0.080

Notes: Dependent variable is a binary variable indicating if the option was selected as the preferred acquirer. Clustered standard errors (by individual) in brackets. Baseline is a domestic company owned by multiple Americans. Estimations come from a Linear Probability Model.

Table 3.19 - Heterogeneity of Anti-Foreign Sentiment Based on Geographic and Cultural Distance

Panel A: Geographical distance

		Individual effect (baseline is a US firm)			Difference in effect		
T-test	Country	Point estimate	Std. Dev.	p-value	Diff. in coeff.	Std. Dev.	p-value
Canada - Australia	CAN	-0.094	0.009	0.000	0.030	0.009	0.001
	AUS	-0.124	0.009	0.000			
Mexico - China	MEX	-0.146	0.009	0.000	0.118	0.009	0.000
	CHN	-0.264	0.009	0.000			

Panel B: Cultural distance

T-test	Country	Point estimate	Std. Dev.	p-value	Diff. in coeff.	Std. Dev.	p-value
Canada - Mexico	CAN	-0.094	0.009	0.000	0.052	0.009	0.000
	MEX	-0.146	0.009	0.000			
Australia - China	AUS	-0.124	0.009	0.000	0.140	0.009	0.000
	CHN	-0.264	0.009	0.000			

Notes: Dependent variable is a binary variable indicating if the firm with the nationality in column 2 was selected as the preferred acquirer. Each individual coefficient shows the probability that an individual would pick an acquirer from that origin country, compared to a US firm. Standard errors were clustered at the individual level. The last three columns present the results of the t-tests for whether the coefficients between each of the pairs of foreign countries are different from each other.

Figure 3.10 - Example of a randomized combination that participants have to choose from

	Firm 1	Firm 2
Buyer is owned by	A family	A family
Amount offered for American Inc.	$650 million	$612 million
Proposed plan for labor force	Fire 1,900 employees	Recruit 1,000 additional employees
Buyer is from	Canada	U.S.

If you had to choose between the two firms, which one should b given priority to acquire the American Industries Inc.?

Firm 1 ○ Firm 2 ○

Figure 3.11 - Example of randomized companies that participants are asked to rate

	Firm 1	Firm 2
Buyer firm is owned by	The government	Multiple foreigners
Amount offered for American Inc.	$575 million	$500 million
Proposed plan for labor force	Fire 1,000 employees	Fire 1,900 employees
Buyer firm is from	United States	Canada

How strongly do you support each of these firms to be the acquirer of American Inc.? Please use the following scale, **where 0 indicates "no support at all" and 10 indicates "absolute support."**

	0	1	2	3	4	5	6	7	8	9	10
Firm 1	○	○	○	○	○	○	○	○	○	○	○
Firm 2	○	○	○	○	○	○	○	○	○	○	○

Figure 3.12 - Cultural and geographic distance matrix

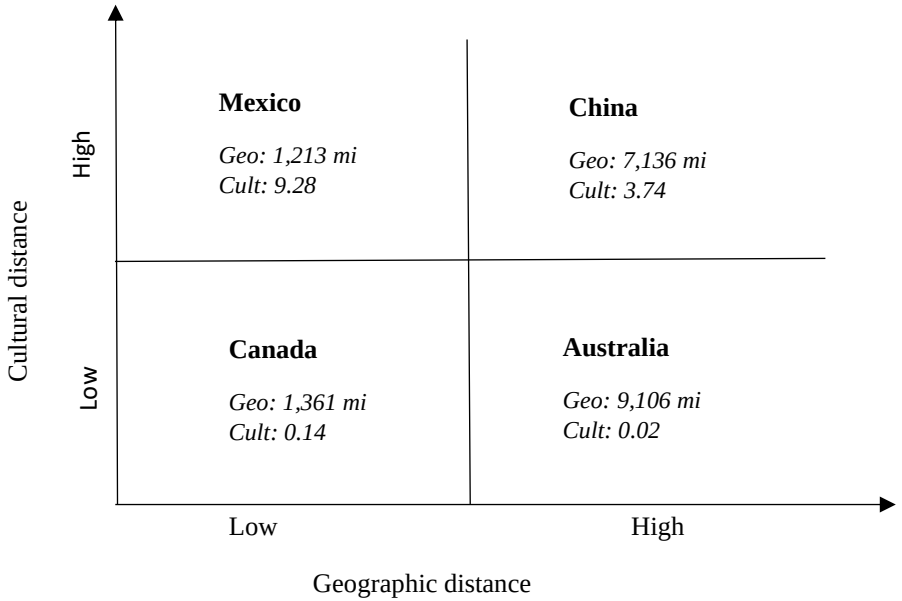


Figure 3.13 - Probability of a firm being selected as the preferred acquirer, by type of owner

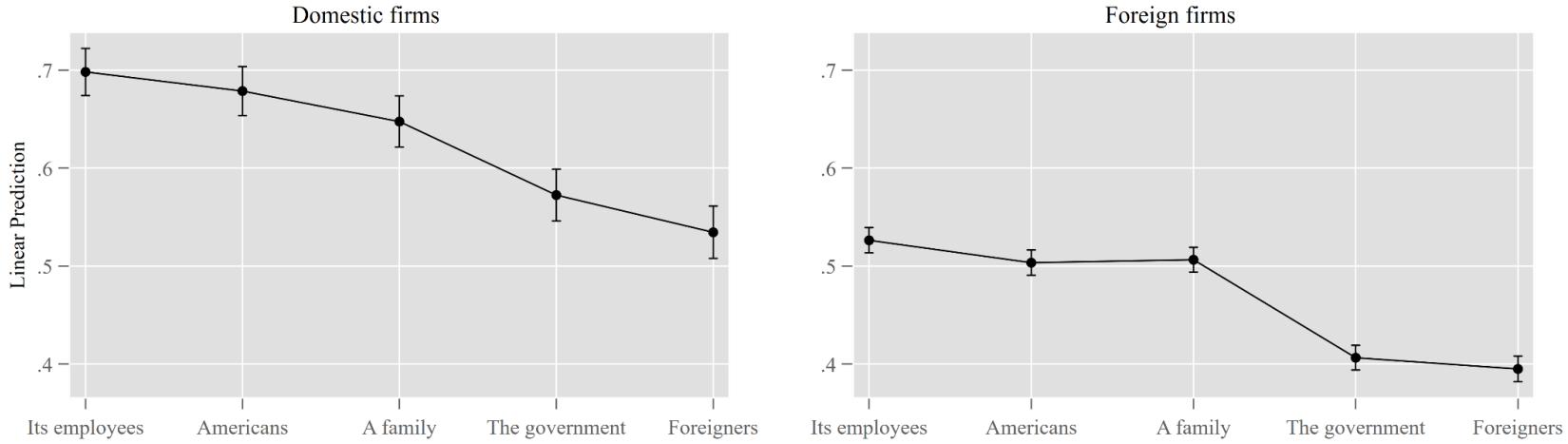
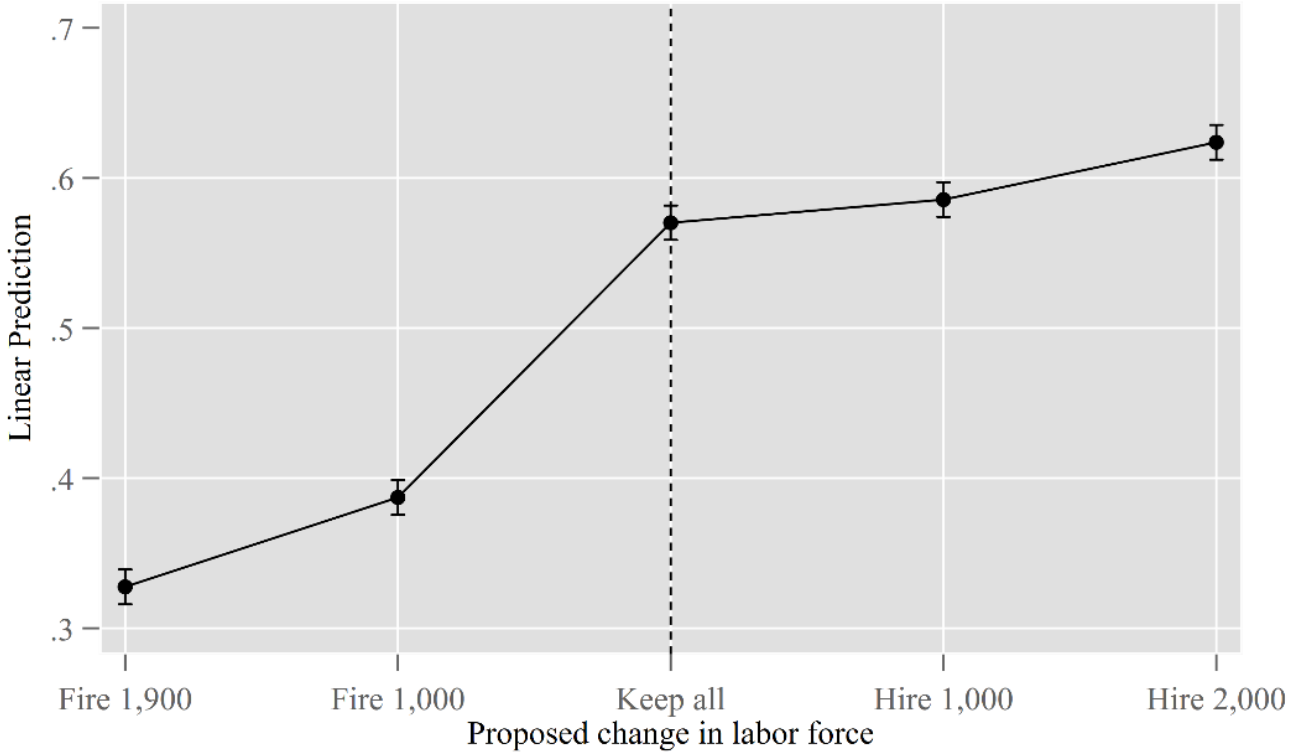


Figure 3.14 - Probability of a firm being selected as the preferred acquirer, by proposed change in labor force



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