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# Capital Market Liability of Foreignness and Country-of-Origin Stereotype: An empirical investigation

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## Research Article

## Capital market liability of foreignness and country-of-origin stereotype: An empirical investigation

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## ABSTRACT

Foreign firms face a liability of foreignness (LOF) in capital markets outside their home countries. Focusing on discrimination hazards as an antecedent to capital market liability of foreignness (CMLOF), we extend the concept of country-of-origin stereotypes to capture discrimination hazards in capital markets. We employ data from foreign firms listed on the three major stock exchanges in the United States from 2002 to 2016 to demonstrate that, compared with domestic US firms, foreign firms are discounted on major stock exchanges in the US and that foreign firms from countries stereotyped as high-warmth and high-competence are not discounted. Our results reveal that discrimination hazards do impact CMLOFs, suggesting that firms venturing into foreign capital markets should invest in perceptions of warmth to mitigate CMLOFs.

## 1. Introduction

Although firms can benefit from conducting business activities internationally, decades of studies show that firms face additional tacit and social costs when operating outside their home countries. This additional cost has been coined the liability of foreignness, or the LOF (Denk et al., 2012; Kostova and Zaheer, 1999; Moeller et al., 2013; Zaheer, 1995). While prior studies have addressed LOFs in product markets, recent studies show that capital markets have similar disadvantages that make it challenging for firms to raise capital outside their home markets (Bell et al., 2012; Temouri et al., 2016; Tupper et al., 2018). Bell et al. (2012) aptly christened this cost the capital market liability of foreignness (CMLOF), and the causes and consequences of – as well as remedies for – the CMLOF is the subject of ongoing scholarly debate (Filatotchev et al., 2016; Lindorfer et al., 2016). For example, Eden and Miller (2001) argued that LOFs stem from unfamiliarity, relational, and discrimination hazards. Unfamiliarity hazards are costs foreign organizations face due to inadequate knowledge of business environments in host countries. Relational hazards are additional costs arising from building relationships with stakeholders in local markets of host countries. Finally, discrimination hazards occur when foreign organizations are treated differently by key constituents in host countries.

Studies in finance and international business have shown that investors prefer financial instruments of local rather than foreign firms.

This leads investors to discriminate against foreign firms in capital markets and thus create CMLOFs (Ardalan, 2019; Bell and Rasheed, 2016; Coval and Moskowitz, 1999). Investor home bias, a form of discrimination, has been theorized as one of the major causes of CMLOFs (Bell et al., 2012; Filatotchev et al., 2016). In contrast to relational and unfamiliarity hazards, discrimination hazards tend to persist over time (Maruyama and Wu, 2015). Despite these findings, most studies of CMLOFs have addressed the causes and consequences of relational and unfamiliarity hazards, with little attention paid to discrimination hazards (Lindorfer et al., 2016; Maruyama and Wu, 2015). While studies have also explored methods for mitigating CMLOFs, mitigating one hazard can potentially exacerbate others (Denk et al., 2012). Developing robust knowledge of – and methods for – mitigating CMLOFs thus requires understanding all hazards. We contribute by examining the role of discrimination hazards in CMLOFs.

In addition to institutional factors, such as institutional distance, accounting standards, and corporate governance, scholars have contended that there are cognitive and behavioral antecedents of discrimination in capital markets (Ardalan, 2019; Denk et al., 2012). Stereotypes, the cognitive basis of discrimination (Dovidio et al., 2010), lead to discrimination when entities are categorized based on discernible characteristics, such as country of origin (COO), and when individual members are assigned group labels. For example, Dimitriadou et al. (2019) identified COO bias in consumption choices, arguing that “a critical cue for

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individuals when deciding whether or not to purchase a product is its COO, allowing for inferences about product characteristics and attributes such as quality, status, and authenticity” (p. 446). Taken together, discrimination hazards, resulting from stereotypes and related COO bias, are likely antecedents of CMLOFs in capital markets.

Building on extant studies of COO and stereotypes, we examine the discrimination hazards of CMLOFs (Halkias et al., 2016; Yildiz and Fey, 2012). We argue that foreign firms listed on major stock exchanges in the United States are stereotyped based on their COOs and that these COO stereotypes partially determine CMLOFs. Following previous COO studies, we conceptualize COO effects as being captured by COO stereotypes, which consist of two dimensions: warmth and competence (Moeller et al., 2013; Newbury, 2012; Vidaver-Cohen et al., 2015). Several studies have demonstrated that warmth and competence are two key dimensions of stereotypes (Cuddy et al., 2007; Durante et al., 2017; Fiske et al., 2002). Warmth captures audience perceptions of friendliness for members of different social groups, with friendly groups considered warm and hostile groups considered cold. Competence captures audience perceptions of capability to carry out intentions, with competent groups perceived as capable and incompetent groups perceived as incapable. Answering the call of Denk et al. (2012) for theoretical pluralism, we argue that perceptions of warmth and competence determine the level of discrimination hazards and CMLOFs suffered by foreign firms listed on major stock exchanges in the US.

We test our theory on a unique dataset of foreign firms from 11 countries that are listed on the 3 major stock exchanges in the US: NASDAQ, NYSE, and NYSE Market (i.e., formerly known as AMEX). The 11 countries are Canada, China, Brazil, Netherlands, the United Kingdom, Switzerland, Ireland, Israel, Argentina, Mexico, and Japan. Using established measures of stereotypes from the literature, we demonstrate that perceptions of warmth and competence impact the levels of CMLOFs that foreign firms suffer on major US stock exchanges. We employ foreign-firm discounts as our measures of CMLOFs (Frésard and Salva, 2010). We not only find that perceptions of warmth significantly reduce CMLOFs but also that foreign firms from respondents’ COOs, and which are thus perceived as warm and competent, do not suffer from CMLOFs.

In this study, we make several contributions to our understanding of foreign firms and LOFs they face in capital markets. First, we extend the COO literature by positioning COO stereotypes as the main cause of COO effects in capital markets. While prior studies have demonstrated similar relationships in product markets, we demonstrate that these relationships can be extended to capital markets. Unlike prior studies that have identified competence as the more potent stereotype dimension in product markets, our study demonstrates that warmth is the primary dimension in capital markets. Second, we explore discrimination hazards as an antecedent of CMLOFs. While prior studies have examined the role of unfamiliarity and relational hazards in CMLOFs (Bell et al., 2012; Lindorfer et al., 2016), we leverage theories of stereotypes to reveal how stereotypical evaluations impact CMLOFs in capital markets. We find general support for our hypotheses, which draw from stereotype measures drawn from related literatures. Finally, we elaborate on the cognitive antecedents of discrimination in capital markets. Investor home bias is well documented in the finance and international business literature (Banti et al., 2018; Bell et al., 2012; Coval and Moskowitz, 1999; Lin and Viswanathan, 2016). Prior studies have highlighted the role of institutional and cognitive factors in perpetuating investor home bias (Ardalan, 2019; Bell and Rasheed, 2016); however, we introduce COO stereotypes as the key cognitive factor underpinning investor home bias in capital markets. We argue that COO stereotypes partially explain why negative investor bias may be greater for some groups of countries than for others.

In this study, we first establish key theoretical anchors and four hypotheses on how discrimination hazards are key antecedents of CMLOFs. We then present our data, methods, and key variables based on foreign firms selected from 11 countries listed on the three major stock

exchanges in the US. Finally, we close with a discussion and main conclusions, as well as limitations and potential future directions, of our study.

## 2. Theory and hypotheses

### 2.1. Theoretical background

Scholars have demonstrated that firms venturing outside their home countries often face LOFs (Bell et al., 2012; Denk et al., 2012; Zaheer, 1995). Although prior studies have demonstrated the existence of LOFs in product markets, recent investigations have shown that foreign actors operating in local capital markets can also face CMLOFs (Bell et al., 2012; Bell and Rasheed, 2016; Tupper et al., 2018). CMLOFs have been studied in multiple capital market contexts, including foreign IPOs (Tupper et al., 2018), cross-listings (Lindorfer et al., 2016), foreign institutional investing (Baik et al., 2013), foreign bond markets (Bae et al., 2013), and venture capital (Humphery-Jenner and Suchard, 2013). In the study of Eden and Miller (2001), discrimination hazards were identified as one source of LOFs. Key local stakeholders, such as consumers, suppliers, financial analysts, and government agencies, may not treat foreign organizations as well as local ones, leading to differential treatment based on discrimination hazards (Moeller et al., 2013). More recent studies have shown that discrimination hazards may also be prompted by local ethnocentrism (Maruyama and Wu, 2015). In addition to tangible costs of discrimination hazards, foreign organizations may also suffer from cognitive biases in the host country. For example, Kostova and Zaheer (1999) argued that cognitive biases are rooted in MNE stereotypes. In this study, we focus on the cognitive aspects of discrimination hazards in capital markets.

We build on literatures that link COO, stereotypes, and LOFs in international marketing to elucidate how discrimination hazards lead to CMLOFs. Links between COO and products/brands are amply documented in the international marketing literature. Studies show that COO not only influences consumer evaluations (Chattalas and Takada, 2013; Halkias et al., 2016) but also provides cognitive cues that facilitate categorization. Recently, scholars have also shown that COO evaluations extend to organizations (Newbury, 2012; Vidaver-Cohen et al., 2015). Vidaver-Cohen et al. (2015) argued that “COO functions as both a cognitive cue that signals levels of product or service quality and an affective trigger with symbolic connotations, stimulating an emotional response toward a firm” (p. 133).

Although these studies were set in product markets, we argue that similar mechanisms operate in capital markets. First, COO is used to classify financial instruments in capital markets (Sonney, 2009), with groupings following geographical origins. Many financial market indices, a key means of sensemaking in capital markets, are based on firm COO since it is one form of categorization that is readily available to key audiences. If COO signals discriminatory responses to firms, it will most certainly shape capital market valuations. Second, studies have also shown that investors demonstrate home bias in allocating their investment portfolios. Rather than allocating their portfolios optimally across different geographical locations, investors tend to favor financial instruments of geographically proximate firms (Bell and Rasheed, 2016; Coval and Moskowitz, 1999; Lin and Viswanathan, 2016). Institutional differences partially account for home bias; however, studies show that behavioral and cognitive biases also play important roles (Ardalan, 2019). Home bias prompts discrimination against firms and foreign financial instruments, thus contributing to CMLOFs (Bell et al., 2012; Filatotchev et al., 2016). Finally, institutional scholars have argued that the complex informational environments of capital markets often induce actors to rely on simplified heuristics, which are based on readily available and easily digestible cues. We argue that firm COO information falls under this category (Newbury, 2012; Vidaver-Cohen et al., 2015).

COO effects are found in stereotypical evaluations of people and entities (Chattalas et al., 2008; Halkias et al., 2016). We employ the term,

COO stereotype, to represent stereotypical evaluations of people, actors, and activities that are perceived as being associated with a particular country (Diamantopoulos et al., 2017; Yildiz and Fey, 2012). For example, French wine, Swiss chocolate, and German cars conjure images that help differentiate these products in the minds of consumers. National stereotypes thus become market stereotypes: generalized country perceptions represent a cognitive articulation and summary of imputed characteristics of individuals, products, and organizations. Despite globalization, COO stereotypes not only persist but also inform evaluations of market actors and activities by key audiences.

Early COO studies have been criticized for lacking a theoretical foundation (Chattalas and Takada, 2013; Halkias et al., 2016). Subsequent studies have contended that dimensions of warmth and competence, drawn from the stereotype content model, capture COO effects that scholars have studied for decades. Chattalas and Takada (2013) demonstrated that COO stereotypes drive consumer expectations of product properties. For example, consumers expect Italian products to be hedonic and German products to be utilitarian. Barbarossa et al. (2016) also demonstrated that consumer stereotypes of firm COO can be linked to blame attributed to firms in the aftermath of a food scandal. For example, Italian consumers attributed greater blame to firms from countries with high-competence and low-warmth (Barbarossa et al., 2016). Overall, these studies establish that warmth and competence are key dimensions of consumer evaluations of market actors and activities.

## 2.2. Hypotheses

Institutional theorists have focused on the role of heuristics over efficient information analysis in mediated social arenas like capital markets (Bell et al., 2012; Filatotchev et al., 2016). Since it is difficult to make sense of a plethora of information about different offerings in mediated markets, evaluators employ simplifying heuristics, with salient categories informing heuristic rules. Investors and market enablers, such as market analysts, employ these rules to confer discriminatory penalties or rewards (Zuckerman, 1999). In complex and dynamic information environments, such as markets, institutionalized rules shape audience interpretations of actors and actions (Bell et al., 2012). A key means of categorization and simplification in capital markets are the geographical origins of issuers of financial instruments. Geographical origins are cognitively salient and affectively imbued, conveying discriminatory information to participants, such as the localness or foreignness of the issuers of financial instruments.

Prior research has shown that key actors in capital markets prefer financial instruments, such as equities, of local firms rather than foreign firms. While growth in global capital markets is undeniable, investor bias against foreign firms persists (Ardalan, 2019; Frésard and Salva, 2010; Sarkissian and Schill, 2004). Local firms constitute the in-group of key market actors, prompting social actors to prefer in-group members in a range of contexts (Dimitriadou et al., 2019). As a result, key market actors not only discount the claims of foreign firms but also form biases that lead to economic penalties. Frésard and Salva (2010) called this penalty the *foreign-firm discount*.

On major US stock exchanges, foreign firms are atypical. We therefore hypothesize that, given the prevalence of investor bias against foreign firms established in prior research, foreign firms listed on US stock exchanges are valued less than their US counterparts (Filatotchev et al., 2016; Frésard and Salva, 2010).

**Hypothesis 1 (H1):** in contrast to equities of US firms, equities of non-US firms are discounted on stock exchanges in the US.

Following Dovidio et al. (2010), bias is defined as “the systematic tendency to evaluate one’s own membership group (the ingroup) or its members more favorably than non-membership group (the outgroup) or its members” (p. 3). Stereotypes, the cognitive underpinnings of biases, are thus defined as “associations and beliefs about characteristics and attributes of a group and its members that shape how people think about

and respond to the group” (Dovidio et al., 2010, p. 8). Stereotypical attributions divide social objects into discernible groups, which have attached labels, pictures, and information that create bias in minds of observers. In-groups – which observers belong to or favor – are stereotyped positively, while out-groups are stereotyped negatively. In the context of capital markets, local actors develop stereotypes and associated biases about foreign financial instruments.

### 2.2.1. Stereotype content model (SCM)

According to the SCM (Aaker et al., 2012; Cuddy et al., 2007; Diamantopoulos et al., 2017; Harmeling et al., 2015), stereotypes have two dimensions: warmth, capturing the degree to which out-group members are perceived as friendly; and competence, capturing the degree to which out-group members are perceived as capable. SCM proponents argue that these two dimensions are the foundation for social perceptions and interactions because they provide survival goals in social interactions (Cuddy et al., 2008). First, social actors evaluate whether the intentions of foreigners, or out-group members, are friendly or hostile. Groups considered to have friendly intentions are considered warm, while groups considered to have hostile intentions are considered cold. Second, social actors must also evaluate the capacity of out-group members to carry out their intentions. Groups considered as capable are considered competent, while groups considered as incapable are considered incompetent.

Industry sectors and COOs are the two most salient classifications of equities on stock exchanges. While investment analysts often specialize in particular industries or countries (Sonney, 2009), studies of equities have focused almost exclusively on industrial sectors (Vergne, 2012; Zuckerman, 2012). There are, however, ample reasons for considering country-based classifications. Like industries, countries are cognitively and symbolically distinctive, and can thus serve as market classifications. Studies have shown that analysts specializing in particular countries have more accurate earnings forecasts than those specializing in particular industries (Sonney, 2009). If alternative explanations, such as heuristics, play a key role in capital markets, country biases are one example to draw upon.

COO stereotypes can shape market evaluations of foreign firms in capital markets outside their home countries. Since audience perceptions of market actors and actions are institutionally embedded, institutionalized heuristics associated with market categorization can influence audience evaluations of market activities. For example, Sharkey (2014) demonstrated that the evaluation of organizational wrongdoing is influenced by the status of the industry in which the firm operates. COO stereotypes are similarly pervasive in many market settings (Aaker et al., 2010; Halkias et al., 2016; Shi et al., 2012). In capital markets, countries with positive COO stereotypes may be rewarded while those with negative COO stereotypes may be punished (Kostova and Zaheer, 1999; Moeller et al., 2013; Newbury, 2012; Yildiz and Fey, 2012). For example, firms from countries with a low-warmth COO stereotype may suffer lower valuations in capital markets in host countries.

Warmth is often considered the primary stereotype since audiences typically evaluate the friendliness of out-groups before considering their capacity to carry out their intentions. Countries stereotyped as warm are considered as showing good intentions toward the country of the audience, while those stereotyped as cold (i.e., low-warmth) are considered untrustworthy (Barbarossa et al., 2016; Harmeling et al., 2015). Perceived levels of warmth can, in turn, be transferred to firms from these countries. Because stereotypes color interpretations of groups, we hypothesize that a warm stereotype often leads audiences to amplify the positive attributes and discount the negative attributes of firms from warm countries (Aaker et al., 2012; Dovidio et al., 2010) and a low-warmth stereotype often leads audiences to discount positive information and amplify negative information about firms from cold countries.

**Hypothesis 2 (H2):** firms from high-warmth countries have lower foreign-firm discounts than firms from low-warmth countries.

Competence captures the perceived ability to carry out intentions. Groups stereotyped as competent are classified with adjectives, such as capable, efficacious, intelligent, and resourceful. Studies have shown that perceived status is the antecedent of the competence stereotype (i.e., high-status groups are perceived as competent). Sharkey (2014) demonstrated that membership in high-status groups is associated with preferential treatment in capital markets and that members of high-status industries restating their earnings suffer lower setbacks on their market values. Foreign firms from high-status countries may enjoy similar rewards from market audiences. Thus, we hypothesize that firms from competent countries may be viewed as capable of delivering on their future obligations and producing consistent returns, while firms from low-competence countries may be viewed as incapable, a perception tied to low efficacy of COO stereotypes.

**Hypothesis 3 (H3):** firms from high-competence countries have lower foreign-firm discounts than firms from low-competence countries.

Finally, audiences evaluate out-groups along dimensions of warmth and competence. As a result, actors classify members of foreign groups according to how warm and competent they are. Social groups fall into one of four configurations: warm and competent; cold and incompetent; warm but incompetent; and cold but competent. A warm and incompetent stereotype is given to groups that audiences consider friendly and capable. Conceptually, in-group members and societal referent groups (i.e., members of society identify with these groups) often fall into this quadrant. A cold and incompetent stereotype is reserved for out-groups that audiences consider hostile and incapable. A warm but incompetent stereotype is applied to out-groups that are considered friendly but incapable. Finally, a cold but competent stereotype is reserved for out-groups that are considered capable but hostile (see Cuddy et al., 2008 for a detailed overview of the SCM). In sum, the various configurations of the stereotype dimensions of warmth and competence determine the social group categorizations.

The combination of warmth and competence dimensions of COO stereotypes can impact the level of foreign-firm discounts. Foreign firms from warm and competent countries will suffer the lowest discount, if any discount at all, because a warm and competent stereotype is the in-group stereotype. As a result, audiences often stereotype members of their in-groups as high-warmth and high-competence. Firms from such countries should thus compare favorably with in-group firms (i.e., local firms). If this favorable, upward comparison is extended to firms from countries perceived as warm and competent, they should be valued at parity with the in-group. We thus hypothesize.

**Hypothesis 4 (H4):** foreign firms from high-warmth and high-competence countries are either not discounted or are discounted the least of the four social-group configurations.

### 3. Data and methods

We analyze foreign firms from 11 countries listed on the three major US stock exchanges (i.e., NASDAQ, NYSE, and NYSE Market, formerly known as AMEX), including Canada, China, United Kingdom, Ireland, Brazil, Argentina, Mexico, Japan, Switzerland, Netherlands, and Israel. Firms listed on major US exchanges are required to comply with all regulatory requirements imposed on local firms (Doidge et al., 2004; Frésard and Salva, 2010). Prior studies have demonstrated that this level of compliance reduces the effects of home-country institutional environments on market valuations of cross-listed firms (Doidge et al., 2004; Frésard and Salva, 2010; Karolyi, 2012). Our selected 11 countries reflect diverse geographical locations and different levels of institutional development (Tupper et al., 2018). While a lack of familiarity is key driver of LOFs and stereotypes in capital markets (Bell et al., 2012; Cuddy et al., 2007), our sample includes countries that had the highest number of foreign listed firms in the US in our data. Thus, they are likely to be the most familiar to US investment communities and thus constitute a conservative sample to test our hypotheses.

We employ the Datastream and Worldscope databases to select firms that traded on our three major US exchanges from 2002 to 2016. We supplement these data with information concerning foreign listings and foreign IPOs from other reliable sources, such as JP Morgan, Citibank, Bank of New York Mellon, NASDAQ, NYSE, and Center for Research on Security Prices (Doidge et al., 2004; Frésard and Salva, 2010). Some of these databases were created by leading investment banks that serve as repositories for these foreign shares. Although some firms list multiple equity instruments on these exchanges, we record one listing per firm: firms enter our data through their first listing and exit when the last of their equity instruments became inactive. To avoid survivor bias, we employed records of both active and inactive equities (Frésard and Salva, 2010). All financial variables are in US dollars (i.e., adjusted for inflation to 2005 US dollars). Following conventions in the foreign listing literature, we drop financial (SIC 6000–6999) and utility (SIC 9000–9999) firms (Doidge et al., 2004; Frésard and Salva, 2010; Lindorfer et al., 2016). We also omit observations missing key variables, such as sales, total asset, and market value of equities, and those with total assets equal to or less than 100 million US dollars.

Our initial dataset consisted of 4,206 local firms and 670 foreign firms, including 34,592 local-firm observations and 5,285 foreign-firm observations over a 15-year period from 2002 to 2016. To reduce non-comparability among local and foreign firms, we used propensity scores to match local observations to foreign observations (Chaplinsky and Ramchand, 2000; Lindorfer et al., 2016). Following Lindorfer et al. (2016), we employed variables quantifying size, profitability, capital expenditure, year, and industry to match foreign observations to local observations. As part of our robustness check, we created different matched datasets by omitting one or more of the matching variables from the matching analysis. We thus created nearest US neighbors (i.e., without replacement) for each foreign observation. Some foreign firms exited our data because there were no close matches based on the variables used in our propensity score matching analysis. The final dataset consists of 8,008 observations from 579 foreign firms and 2,073 local firms.

#### 3.1. Variables

##### 3.1.1. Log of Tobin's Q

Tobin's Q compares the market value of a firm to the replacement cost of its asset. In the finance literature, it is often used as a measure of firm value (Doidge et al., 2004; Frésard and Salva, 2010). We follow convention for the numerator: we subtract the book value of the equity from the book values of assets, and then add the market value of the equity. The numerator is the book value of the asset. Due to the highly skewed distribution of Tobin's Q, we create a new variable by computing the natural logarithm of the Tobin's Q variable. The log of Tobin's Q is the independent variable for all our analyses.

##### 3.1.2. Stereotype variables

While we conducted an extensive search of the literature to find an existing method of measuring country-level bias, we found no satisfactory measures. We therefore adapted measures of stereotypes, drawn from marketing and social psychology, to capture stereotypical perceptions held by US citizens of people and entities from the countries represented in our dataset. We surveyed 517 US citizens, who were 18 years or older and current residents of the US. Participants were recruited through the online academic survey platform, Prolific Academic, and were paid US\$1.15 for their participation. On average, each participant spent a little over 10 min on the survey questionnaire, which assessed how US citizens perceived people and entities from our 11 sample countries. In addition to demographic questions, each participant answered a total of 88 questions (i.e., eight questions per country). Participants were also informed that they could refuse to complete the questionnaire and that they could skip questions (i.e. by choosing the option NA) if one or more of the questions made them uncomfortable for

any reason. With refusals and incomplete questionnaires excluded, our final response count was 497 US citizens, with a median age of 41 and with 56.3 % female.

### 3.1.3. Measurement of stereotype variables

All measures and scales were either adapted from previous COO stereotype studies or studies using the SCM in international marketing and social psychology (Aaker et al., 2010; Barbarossa et al., 2016; Cuddy et al., 2007), two areas that have developed robust stereotype measures for intergroup perceptions. Participants selected measures of perceptions of warmth and competence on a 7-point Likert scale (Aaker et al., 2010; Bernritter et al., 2016). The scale for warmth includes *good natured* and *generous* (Cronbach's Alpha >0.86 for all 11 countries), while the scale for competence includes *effective* and *intelligent* (Cronbach's Alpha >0.87 for all 11 countries). ANOVA analysis revealed that Canada (M = 5.64, SD = 1.09) and the United Kingdom (M = 4.84, SD 1.07) were perceived as warmer than China (M = 3.17, SD = 1.33) and Israel (M = 3.66, SD = 1.31), with p < 0.001. Similarly, Switzerland (M = 5.52, SD = 1.06) and Japan (M = 5.98, SD = 0.98) were perceived as more competent than Argentina (M = 3.71, SD = 1.08) and Mexico (M = 3.20, SD = 1.34), with p < 0.001. We tested our hypotheses by combining the survey stereotype measures with data from different databases.

We control for several firm-level variables impacting capital market valuations: (1) for firm size, we employ logarithm of sales (Frésard and Salva, 2010; Lindorfer et al., 2016); (2) for growth opportunities and firm-level profitability (Aggarwal et al., 2009), we employ return on assets and global industry Tobin's Q (i.e., median industry Tobin's Q at the two-digit SIC code); and (3) for firm financing and investment policies, we employ cash holdings and capital expenditure as proxies (Durnev and Kim, 2005). Finally, we control for institutional distance between firm COO and the US. Following Tupper et al. (2018), we calculate institutional distance as the Euclidean distance index between World Governance Indicators for the US and the COO of the foreign firm. Appendix A presents all variables, with associated descriptions and sources.

## 3.2. Results and hypothesis testing

We use pooled hierarchical linear models for our estimations. The observations in our dataset are nested within organizations (i.e., there are often multiple observations from the same organization). Since the organizations are also nested within different countries, key independent variables, such as warmth and competence, and control variables, such as institutional distance, are country-level measures. Thus, the dataset has observations nested within organizations, which are, in turn, nested within countries. Observations are further nested within years of measurement. Hierarchical linear models allow us to capture variances at these different levels of analysis. We employ cross-effect models that capture variances at these different levels. Table 1 presents descriptive statistics and a correlation matrix, with no problematic or surprising cross-correlations among the variables.

Table 2 presents the pooled hierarchical regression results. Models 1 and 2 test H1: in contrast to equities of US firms, equities of non-US firms

are discounted on stock exchanges in the US. Model 1 presents the results of the control variables for industry Tobin Q, capital expenditure, cash holding, ROA, sales, and institutional distance. The model mostly follows expected patterns. For example, organizations from countries that are institutionally close to the US performed better than those that are institutionally dissimilar. Industry Tobin Q, capital expenditure, return on assets, and cash holding also correlate with higher valuations. To test H1, we created a dummy variable (Foreign) that takes the value 1 for foreign firms and 0 for local US firms. Model 2 presents the results of introducing the new dummy variable in the hierarchical model. Consistent with H1, the coefficient of the dummy variable is negative and significant. On average, foreign firms listed on major stock exchanges in the US have lower values than their US counterparts. Models 1 and 2 thus provide support for H1.

Models 3 and 4 test H2: firms from high-warmth countries have lower foreign-firm discounts than firms from low-warmth countries. To test this relationship, we introduce warmth scores in Model 3. Our results are consistent with H2, since the coefficient of warmth was positive and significant. A higher warmth score is associated with higher capital market valuations for foreign firms on major stock exchanges in the US. In Model 4, we create a new categorical variable to separate observations from countries with high-warmth scores from those with low-warmth scores. A country is considered to have high-warmth if its score is greater than or equal to the median warmth score in the data, while a country is considered to have low-warmth if its score is less than the median warmth score. The new categorical variable takes the value 0 for US firms, 1 for countries with low-warmth scores, and 2 for countries with high-warmth scores. In Model 4, this new categorical variable replaces the dummy variable (Foreign). The results of Model 4 reinforce the results of Model 3. While the coefficient for the low-warmth category is negative and significant, the coefficient for the high-warmth category is negative but not statistically significant. Models 3 and 4 thus provide robust support for H2.

Models 5 and 6 test H3: firms from high-competence countries have lower foreign-firm discounts than firms from low-competence countries. Like Model 3 (H2), we again introduce the competence score into our base model to test Model 5. In this case, our results were not consistent with H3, since the coefficient of the competence variable was not significant. A higher competence score does not impact valuations of foreign firms on major stock exchanges in the US. For Model 6, we create another categorical variable to separate observations from countries with high-competence scores from those with low-competence scores. A country is considered to have a high-competence score if it is greater than or equal to the median competence score, while a country with a competence score lower than the median is considered to have a low-competence score. This categorical variable takes the value 0 for US firms, 1 for countries with low-competence scores, and 2 for countries with high-competence scores. The results of Model 6 do not support H3, since the coefficients of low-competence and high-competence are negative and significant. Models 5 and 6 do not provide support for H3.

Finally, Model 7 tests H4: foreign firms from high-warmth and high-competence countries are either not discounted or are discounted the

**Table 1**  
Descriptive statistics and correlation matrix.

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1. Foreign	0.49	0.50	1									
2. Log of Tobin Q	0.44	0.55	-0.14***	1								
3. Log of Ind Q	0.41	0.24	0.01	0.39***	1							
4. Log of Capex	1.50	1.08	0.08***	0.02	-0.16**	1						
5. Log of Cash Ho	12.20	2.00	0.19***	0.04***	0.03**	-0.04***	1					
6. Log of ROA	1.85	0.89	0.01	0.38***	0.14**	0.08***	0.11***	1				
7. Log of Sales	14.34	1.91	0.01	-0.07***	-0.14**	0.06***	0.69***	0.06**	1			
8. Warmth	2.21	2.32	0.66***	-0.10***	-0.01	0.11***	0.18***	0.01	0.04***	1		
9. Competence	2.41	2.48	0.58***	-0.12***	0.03**	0.08***	0.18***	0.01	-0.01	0.66***	1	
10. Inst Distance	1.10	1.58	0.71**	-0.21***	-0.02	0.05***	0.09***	0.03**	-0.16***	0.50***	0.65***	1

**Table 2**  
Pooled hierarchical regression results.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
<b>Control Variables</b>							
Log of Industry Q	0.76***	0.75***	0.75***	0.75***	0.75***	0.75***	0.75***
Log of Capex	0.06***	0.06***	0.06***	0.06***	0.06***	0.06***	0.06***
Log of Cash Holdings	0.03***	0.03***	0.03***	0.03***	0.03***	0.03***	0.03***
Log of ROA	0.14***	0.14***	0.14***	0.14***	0.14***	0.14***	0.14***
Log of Sales	−0.06***	−0.06***	−0.06***	−0.06***	−0.06***	−0.06***	−0.06***
Institutional Distance	−0.08***	0.03	0.08*	0.08	0.07	0.02	0.05
<b>Independent Variables</b>							
Foreign		−0.13***				−0.20	
Warmth			−1.85**				
High-Warmth COO				−0.13			
Low-Warmth COO				−0.42**			
Competence					0.01		
High-Competence COO						−0.12**	
Low-Competence COO						−0.15***	
US COO							0.03
High Warm Low Comp COO							−0.23**
Low Warm High Comp COO							−0.35***
Low Warm Low Comp COO							−0.04
Crisis (Y3)							
Crisis x US/Foreign (Y3)							
Chi Square	3678***	3702***	3711***	3709***	3699***	3702***	3699***

least of the four social-group configurations. To test this hypothesis, we create yet another categorical variable that distinguishes between foreign firms based on the warmth and competence scores of their respective countries. The categorical variable takes the value of 1 for countries with high-warmth and high-competence scores, 2 for countries with high-warmth and low-competence scores, 3 for countries with low-warmth and high-competence scores, and 4 for countries with low-warmth and low-competence scores. To test H4, we replace the foreign dummy variable with the new categorical variable. Model 7 compares local US firms with firms from COOs that are high-warmth/low-competence, low-warmth/high-competence, low-warmth/low-competence, and high-warmth/high-competence.

The results of Model 7 largely support H4, since the coefficients for US firms were not statistically different from those of firms from high-warmth/high-competence COOs. Firms from high-warmth/high-competence COOs were not discounted compared with local US firms. While the coefficients of high-warmth/low-competence and low-warmth/high-competence were significant and negative, the coefficient of low-warmth/low-competence was negative but not significant. The results show that foreign firms from warm and competent COOs have a lower discount than firms from warm but incompetent COOs and firms from cold but competent COOs. However, the results do not support a similar conclusion for firms from cold and incompetent COOs. Model 7 thus provides partial support for H4.

#### 4. Conclusion

Scholars have recently extended the concept of the LOF to capital markets (Baik et al., 2013; Bell et al., 2012; Filatotchev et al., 2016), arguing that discrimination hazards and home biases are key antecedents of CMLOFs. In this study, we investigate the relationship between discrimination hazards and CMLOFs, citing stereotypes as the cognitive basis of discrimination, including investor home bias. Answering the call for theoretical pluralism when investigating the phenomenon of the LOF, we build on existing literature addressing COO stereotypes to develop and test hypotheses concerning the relationship between COO stereotypes and CMLOFs (Denk et al., 2012). We employ the context of foreign firms cross-listed on stock exchanges and find, for the most part, support for our four main hypotheses. Consistent with prior studies, we first find that foreign firms do suffer from CMLOFs, which we conceptualize as discounts conferred on cross-listed firms. Second, we find that warm stereotypes ameliorate foreign-firm discounts: firms from high-warmth

countries suffer a lower foreign-firm discount than firms from low-warmth countries. Third, firms from countries with high-warmth and high-competence measures suffered no discount compared to firms from countries with low scores on either the warmth or the competence measures. However, we also found, though contrary to our expectations, that firms from high-competence countries do not benefit from lower foreign-firm discounts than their low-competence counterparts. Overall, our results reveal that discrimination hazards do have a significant impact on CMLOFs.

Our study thus contributes to theories of international business and finance. Studies have pointed to varying levels of LOFs among organizations from different institutional environments (Frésard and Salva, 2010; Newburry et al., 2006). While institutional distance has been the primary explanation for varying levels, there have been recent calls to investigate the perceptual underpinnings of LOFs, including the impact of discrimination hazards and home biases (Denk et al., 2012; Newburry et al., 2006). In this study, we examine the relationship between discrimination hazards and CMLOFs, finding general support for our hypotheses. Firms listing financial instruments outside their COOs face a distinctive home bias in the host market from important audiences, such as investors and analysts (Comiran and Siriviriyakul, 2017). While Frésard and Salva (2010) aptly theorized and measured foreign-firm discounts, they were, however, silent on the potential role of bias. We thus extend the work of Frésard and Salva (2010) by investigating bias (i.e., specifically, discrimination hazards), employing foreign-firm discounts as our measure of CMLOFs (Tupper et al., 2018). We not only demonstrate that the bias of “foreignness” negatively impacts foreign-firm valuations but also that COO stereotypes held by US citizens influence the level of discounts foreign firms suffer on major US stock exchanges.

Denk et al. (2012) called for theoretical pluralism in investigating the antecedents – and consequences of – LOFs since approaches employed in extant research have often yielded conflicting results. Many strategic management and organizations theories, such as the resource-based view, institutional theory, and organization learning, have been deployed to reveal the basis of LOFs (Denk et al., 2012). While LOFs arise from local audiences’ subjective judgments of foreign firms, these theories scarcely capture the perceptual bases of biased judgments. We employ stereotype theories, drawn from marketing and social psychology, to reveal the relationships between discrimination hazards and CMLOFs. Our framing deepens current theoretical understandings of LOFs by demonstrating that positive or negative local biases toward the COO of a firm impact LOFs encountered in foreign equity markets.

In most studies on foreign equity listings, foreign firms are compared with local firms in their home countries (Doidge et al., 2004; Frésard and Salva, 2010; for an exception, see Tupper et al., 2018). This approach has often made it difficult to interpret results because the benefits of foreign listings are calculated by comparing foreign-listed firms with firms from different institutional environments, which results in comparing firms that may have little or even nothing in common (Frésard and Salva, 2010). Following extant literature on LOFs, we compare foreign firms with local firms in their host rather than home countries, thereby making host-country firms the benchmark for measurement. Consistent with studies that compare foreign-listed firms with firms in their host countries, we find a foreign-firm discount rather than a foreign-listing premium (Doidge et al., 2004; Tupper et al., 2018). We also find that local perceptions of the COO of a foreign firm impacts the level of foreign-firm discount that it will suffer on major stock exchanges in the US. Perennial links between institutional distance measures and LOFs mean that COO effects are considered key antecedents of LOFs. While many studies have operationalized COO effects as idiosyncratic (i.e., captured empirically as dummy variables for different countries), other studies leverage COO stereotypes to capture COO effects in markets (Chattalas et al., 2008; Halkias et al., 2016; Newbury et al., 2006). Our study is the first to use this latter approach to capture COO effects on CMLOFs. Our approach is thus both parsimonious and theoretically grounded.

The SCM positions bias along two dimensions – warmth and competence, creating four configurations of COO stereotypes (Cuddy et al., 2008; Halkias et al., 2016). We show that these four configurations map onto varying levels of CMLOFs. While prior research has shown the primacy of competence over warmth in markets (Aaker et al., 2010), we demonstrate that competence only captures the perceived ability to follow through on intentions. Whether this is related to positive or negative outcomes is determined by the perceived benevolence of the intention, as captured by the dimension of warmth. In our sample, the only time high-competence reduced CMLOFs was when it was paired with high-warmth. However, when high-competence was paired with low-warmth, it produced the highest level of CMLOFs. These results are consistent with research that has shown strong aversion for efficacious adversaries, whereby investors are better served if they distrust firms from countries perceived as capable but untrustworthy (Aaker et al., 2012; Cuddy et al., 2011).

#### 4.1. Study limitations and future research

In this study, we based our analysis on a sample of foreign firms listed on major stock exchanges in the US, some of the largest equity markets in the world. However, the dynamics of these US-based markets may differ from those located in other institutional environments. For example,

some European stock exchanges are partly regulated at the continental level. We are thus limited in our ability to generalize our findings to foreign listings, especially by European firms, on these exchanges, since they may engender different mechanisms (Lindorfer et al., 2016). One further limitation of our study is that, while it is longitudinal, our measures of perceptions of bias are not. Although the literature on biases supports durable stereotypes, changes in socio-political environments and relationships between countries may impact biases about entities from different countries (Dovidio et al., 2010). Future research should develop longitudinal measures and/or proxies for biases and perceptions that evolve over time.

Since firms that list their equities outside their COOs are usually among the most reputable in their home countries, they typically enjoy premium valuations compared to others firms in their COOs (Doidge et al., 2004). Our sample thus consists of mostly elite firms since we drew our firms from three major stock exchanges in the US. By using these data, we expect that our results are conservative in terms of the levels of foreign-firm discounts in capital markets. Finally, we focus on firms from countries with the highest numbers of firm-years in our initial data. Given that stereotypes thrive in the absence of repeated interactions, the impact of stereotypes on valuations of firms from countries with fewer representatives on major stock exchanges may be higher.

Despite these limitations, our study is well-positioned to inform future studies examining how stereotypical perceptions of key audiences play out in other capital markets. For example, how do perceptions of warmth and competence influence CMLOFs in bond markets, which are some of the largest and most developed global capital markets? And how do perceptions of warmth and competence influence choices of destination for foreign listings and initial public offerings? Future studies should also investigate how leading national exchanges proactively solicit foreign firms to list on their markets (Karolyi, 2012). For example, do firm COO stereotypes impact and/or predict likely capital market destinations? Finally, future research should investigate COO stereotypes that can potentially reveal market-entry strategies of foreign-products. We argue that studies of internationalization strategies have focused almost exclusively on strategic and institutional variables, neglecting intergroup perception variables (Newbury et al., 2006). A key area of inquiry should thus address if firms are more likely to form alliances with firms from countries stereotyped as warm and competent than those stereotyped as cold and incompetent.

#### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Appendix A

**Table A1**

Variables, definitions, and sources.

Variable	Definition	Sources
<b>Firm</b>		
Foreign	Dummy Variable that takes the value of 1 if the firm is foreign and 0 if US-based	Various sources
Total Assets	Book Value of Total Assets (in millions of USD)	Worldscope, Datastream
Sales	Yearly Sales (in millions of USD)	Worldscope, Datastream
Tobin's Q	(Book Value of Asset – Book Value of Equity + Market Value of Equity)/Book Value of the Asset	Worldscope, Datastream
Log of Tobin's Q	Natural Logarithm of Tobin's Q	Worldscope, Datastream
Log of Industry's Q	Median Log Tobin's Q for the firm industry (2-Digit SIC Code)	Worldscope, Datastream
Capital Expenditure	Capital Expenditure/Total Assets	Worldscope, Datastream
Cash Holding	Cash and Marketable Securities/Total Assets	Worldscope, Datastream
ROA	Return on Assets	Worldscope, Datastream

(continued on next page)



Table A1 (continued)

Variable	Definition	Sources
<b>Country</b>		
Institutional Distance	Euclidean distance between World Governance Indicators measures for foreign COO and for the US	World Bank Group
Warmth	US citizens perception of warmth of citizens of the foreign country	Survey questions
Competence	US citizens perception of competence of citizens of the foreign country	Survey questions

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