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Shaping of Strategic Behavior: How Macro-Environmental Effects Pattern the Country-Level Participation of Non-US Firms in US Equity Markets

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ABSTRACT *This paper examines the effects of macro-environmental variables on country-level patterns of participation by firms on the US NASDAQ stock exchange. NASDAQ's popularity can be linked to the strength of its technological system, as well as the high frequency of listings of technology-oriented firms. Using concepts from organization theory, strategy and international business, we consider the impact of political, legal, cultural, and colonial heritage status on the strategic capital-seeking behavior of non-US companies in US markets. We empirically demonstrate that similarity in legal systems and a shared colonial heritage will influence the probability of a non-US country having firm participation on the NASDAQ. The results also indicate that the effects of institutional forces are not static processes*

Introduction

A central concern in international business is explaining patterns of behavior across firms both within non-domestic markets and across countries. Scholarship has focused largely on individual firm behavior with the role of industry and state receiving secondary attention. Moreover, the larger environmental factors that shape all of these entities and the relationships among them have not received adequate attention. In particular, the role of wider systems of meaning in determining firm-level activity is largely ignored. One creator of common systems of meaning is national culture. Although a consensus exists that many differences between countries can be explained by national culture, its impact on specific firm activities has not been adequately discussed. Similarly, the role of other systems meaning, such as those caused by political and legal factors, has not been thoroughly investigated.

Comparable claims of lack of attention to macro forces can be made for the discipline of corporate strategy. With a focus on the firm and the top management

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team, the pre-conditions that shape or limit strategic options have not received adequate attention, particularly in an international context, although there are notable exceptions.[1] As a result, the effect of national culture, historic context and social arrangements on the strategic behavior of firms, whether domestic or international, is not well understood.

To fill this gap, we examine the influence of country-level macro-environmental forces on the strategic behavior of firms and examine the patterns of participation of non-US firms in the US equity market. This study takes a different approach to look at international corporate strategy as neither the macro-environmental force effects, nor firm-level strategic prerogatives, as international equity acquisition, has been considered in the management, international business, or finance literatures to date.

Rather, the focus has been on risk assessment, the finance literature's macro-perspective on world capital markets has investigated capital flows, balance of trade, the effects of exchange rate fluctuation on accurate market prices, and the mobility of capital throughout the world.[2] From an investor's, or micro-finance perspective, the costs and benefits of international stock purchases and sales, and the added country level risks to stockholders, have been studied.[3] Numerous authors have taken a financial return/risk perspective in considering international equity offerings as a means to gradually diminish financial market segmentation and the associated effects.[4]

Therefore, concern with the macro-environment in this finance discussion has been limited to how changes in the stability of the political or economic system may affect share price.[5] This work has not addressed how systems of meaning, including political, cultural or legal systems, may influence firm-level behavior, in particular the decision to seek equity on foreign stock exchanges. Nor has it considered when and why a particular firm might benefit from equity listing abroad.

In this paper we are particularly interested in the way in which the institutional environment shapes such strategic decisions. By more fully attending to institutional forces in global equity markets, corporate firm-level actions can be better understood. To accomplish this objective it is necessary to blend the research streams of international business, corporate strategy, and organization theory in order to bring a new perspective to our understanding of the corporate international equity acquisition process.

By simultaneously considering factors at the firm, industry, field, national, and transnational levels, we hope to provide better explanations of certain firm level strategic behavior. We use the nation state as the level of analysis where macro-environmental forces influence the firm in order to investigate this phenomenon. Our key research questions are:

(1) Are there patterns of strategic activity at the country level?
(2) Can firm level activity be explained, at least in part, by country level factors?

We begin by presenting a brief description of the US equity markets. Next, we present a theoretical argument drawing from work in international business, corporate strategy, and organization theory. Then we hypothesize how country-level variables affect international listing behavior by firms and test these

hypotheses using data on international firms' equity listing on the US NASDAQ stock exchange. Finally we discuss the implications of our findings and suggest further research avenues.

US Equity Markets

The dominant equity markets in the USA are the New York Stock Exchange and NASDAQ. Each exchange has different listing requirements for companies, they differ in their platforms (auction-based or market-maker based), and the technology they use, but each allows international listings either directly or through American Depository Receipts. Unlike stock exchanges in other countries (e.g. Japan, where 95% of the listings on the Toyko stock exchange are also listed in Osaka) there is no overlap between the largest US equity exchanges.[6]

NASDAQ accounts for more than half of all equity shares traded in the US each day and more companies—domestic and foreign—list their securities on NASDAQ than on all other US stock markets combined.[7] NASDAQ operates with two tiers: the National Market with more than 3351 of NASDAQ's larger, more actively traded companies (e.g. Microsoft, valuation US $271 billion) and the SmallCap market made up of 758 smaller, emerging companies (e.g. Biofield Corp, valuation US $14 million). Worldwide, NASDAQ is the second largest equity market in dollar value of trading.[8]

One reason that NASDAQ is so popular with listing companies is the strength of its technological system. Unlike traditional, auction-based systems, NASDAQ uses a screen-based, market-maker system where buyers have the choice of several sellers for their stock. To maintain technological leadership the exchange invests heavily in technology. In 2002 NASDAQ has introduced a new automatic execution system as well as a new market platform, Supermontage.[9]

The average companies listing on NASDAQ have total assets of US $555.7 million, and total revenues of US $234.1 million. NASDAQ companies are noted for a large concentration of inside ownership—insiders hold 28% of the outstanding shares of NASDAQ/NMS stocks. This inside ownership is a major strength of NASDAQ companies: management, in many cases, retains an entrepreneurial interest.[10]

NASDAQ is particularly popular as a listing site for technology-oriented firms. Of US publicly traded companies, 82% of all biotechnology and health care companies, 67% of telecommunications companies, 57% of all financial service companies and the majority of information technology companies—77% of computer hardware and peripherals companies, 85% of all computer software and data processing companies, 96% of computer networking companies, and 87% of semiconductor companies, are listed on NASDAQ.

The majority of foreign companies whose shares are traded in the US are listed on NASDAQ.[11] Explanations for this phenomenon include less rigorous listing requirements[12] and the increased liquidity and visibility for stocks in a market making environment.[13] The NYSE expects higher capitalization and trading volume than NASDAQ, so NASDAQ is a particularly appropriate forum for growth oriented technology-focused, entrepreneurial firms. In this paper we are interested in the distribution of equity of foreign firms listed on NASDAQ.

The Macro Environment in Strategic Approaches

An economic perspective on strategic behavior stresses the impact of industry factors on firm behavior; the firm is the predominant unit of analysis. How a firm can maximize its profitability is the defining strategic management question and research in the field has focused on the variations in profitability that can be linked to industry dynamics and to a firm's strategic decisions.

The fundamental role that the macro-environment plays on firm-level behavior and decision making is a major teaching topic in strategy but it has received limited theoretical and empirical development, with a few noteworthy exceptions.[14] Strategy views the macro-environment in terms of the 'opportunities' or 'threats' it delivers to the firm. These opportunities and threats are to be managed, if possible: the assumed point of view is that the firm is in the driver's seat as it maneuvers, it attempts to take advantage of these forces. This orientation to the macro-environment neglects the institutional context in which strategy occurs and the ways this context shapes, develops and changes firms and what they do. An institutional approach suggests that the macro-environment is fundamental to firm and industry behavior, and ultimately, to performance. In this view, macro-environmental forces are believed to be more received than controlled.

Two decades have passed since Schendel and Hofer[15] called for work on the 'enterprise level' of strategy, but most scholars have not chosen to pick up their call. A notable exception is the work of Michael Porter, who explicitly addresses these issues in his *Competitive Advantage of Nations.*[16] In this work on industry competition, Porter theorizes that determinants of productivity and growth are the result of different characteristics of the nation, some of which relate to the institutional environment in which firms are operating. However, the effect of macro-environment forces on firm-level decision-making behavior, while acknowledged, is outside the scope of his project.

Organizations are constantly scanning the environment for new ways to foster innovation and new product or service development. Often in order to stimulate innovation, outside sources within the environment are sought out to quickly gain access to new ideas, patents, products or processes.[17] This is more important or noticeable in high-technology industries where extraordinary turbulence exists and rapid changes in technology and regulation are the norm.[18]

In summary, what strategic management offers to the debate is a focus on the firm and its quest for success but we suggest that a richer understanding of the effects of the macro-environment can contribute to a better understanding of a firm's capabilities, as well as its limits.

Institutional Approaches

Strategic approaches contrast with those in organization theory and international business, which tend to focus on the effects of populations, fields or industries on organizations. Much of this macro work highlights the effects of population or industry dynamics on firm behavior, such as in studies of new venture creation or organizational foundings,[19] new organizational practices[20] or technology.[21]

However, this macro work has not been integrated into the mainstream scholarship on corporate strategy. Given the volatility and diversity of local environments, this concern with the wider environment is particularly relevant when the research questions involve issues of international strategic action.

The influence of the wider environment has received attention from institutional theorists. They have focused on how fields of activity (industries, populations, countries) become structured and organized and the subsequent effects on organizational activity. In explaining the mechanisms for change or coordination, scholars are able to account for individual firm behaviour.[22] Work in this area has been prolific in illustrating the effects of the external environment on the organization.[23] This view of the environment is based on several assumptions about the core of societal action. First is the idea that action is structured. Unlike economic theories, this work does not view activity as the actions of autonomous actors; rather, the assumption is that behavior is structured by a variety of forces such as culture, social norms, and regulatory requirements.[24] This holds true for economic activity as well: it is socially ordered. Actors act, but they do so while embedded within a wider framework.[25] Analysis of these wider social and cultural networks will permit a better understanding of their behavior.

Not only are these organizations embedded in wider networks but organizations and relationships are infused with meaning and value. The symbolic meaning that motivates or is instilled within behavior is seen as an important aspect in explaining firm level behavior.[26] By viewing organizations as more than mechanisms to solve complex coordination and control issues, scholars are able to delve into how organizations and, by extension, top management teams act and what the symbolic implications are. It is this emphasis on systems of meaning that makes this theory powerful in looking across countries.

National culture is possibly the most common of all meaning systems. The impact of national culture has been demonstrated in organization theory to have direct and distinct effects on individual organizations.[27] Consequentially, work in this area focuses on how these meaning systems affect organizations, behavior by organizations, and individual actors.[28] These findings stipulate that national culture shapes organizational forms and that these meaning systems affect firm behavior. We suggest that national cultures are integral in molding what firms do, and that one can see the impact and influence of cultures and meaning systems in the organization's activities—specifically, its strategic behavior.

An oft-cited theme of this literature is the role of macro mechanisms in promoting similarities among firms. Research has identified institutional effects[29] and has explained why one sees limited diversity in organizations within a field.[30] Because of the association between institutional theory and similarity between organizations, this approach has been interpreted as a theory of stagnation where organizations are constrained by wider field dynamics to be like other organizations and then are locked into certain patterns.[31]

We argue, however, that the effects of isomorphism can be interpreted in another way: as macro forces act to make the system's component organizations more similar, the organizations themselves change. Organizations are reorganiz-

ing themselves to be competitive in a given arena. It is not just the individual organizations that change, for such organizational change causes transformation in the overall population.[32] Therefore, change is continual within the system. Even if the population dynamics remain constant, the organizations themselves are altering. As the organizations alter they then influence the field. In addition to the internal field dynamics, a variety of forces for transformation (e.g. new technologies, organizational routines, new firms) promote innovation. As studies have indicated, innovation can come from a variety of places but influences behavior throughout the field.[33] Therefore institutional theory can be regarded, from this perspective, as a theory of change and one can appropriately apply it to questions of strategic choice.

International Business

One stream of international business research that has addressed issues of concern to institutional theorists examines the ways that external factors affect firm behavior. Scholars have demonstrated the important role that issues such as culture, political risk, and globalization play in business decisions within an international context. In general, the focus of this work has been on firm-level activity. However, we found no research that looked at the mechanisms that might promote certain types of firm activity across a range of countries.

Numerous scholars have focused on the importance of understanding the subtleties of the environment at the nation-state level and the organizing principles associated. Kogut[34] suggests that researchers should attempt to decipher the organizing principles within that nation. These organizing principles provide a source of competitive advantage or disadvantage.[35] Egelhoff[36] expresses that an organization's strategy should incorporate the critical or constraining elements of that national environment.

Other scholars have categorized different environments and their associated diversity as an opportunity for the organization to embrace. Kogut[37] posits that adeptness as a global strategizer arises from enhanced flexibility and recognition of arbitrage opportunities between different global environments. Bartlett and Ghoshal[38] identify that experience arising from the interface with diverse environments, and the associated learning potentials, may be a primary source of competitive advantage for multinationals in relation to domestic organizations.

The diversity of environments, and the cultures within them, has also been identified as a stimulus for heterogeneity of organization.[39] Doz and Prahalad[40] attribute this heterogeneity to economic and political characteristics of the different environments an organization interfaces with.

International business research has demonstrated that national boundaries matter in terms of business activity and performance. Different conditions are delivered to firms via nation state structures and global firms are influenced by this diversity.[41] In the next section we argue that by blending work in organization theory, international business, and strategy we can more fully explain broad patterns of international behavior.

Bridging Perspectives

What decisions firms make, the actions they take, and the responses that those actions bring are all influenced by realities in the macro-environment such as social, demographic, cultural, legal, technological, and political forces. These realities change over time, geography, and firm characteristics. For example, a major concern of the business literature is firm financing. Finance theory can help explain when, why, and how different financing forms are most appropriate given various contexts. However, when the goal is to identify the mechanisms that influence such outcomes, for example, to explain differences in financing behavior for women *vs* men or early stage financing options for US *vs* Irish firms in similar industries an institutional approach is needed. Wider social forces must be taken into consideration when patterns of behavior across firms are involved.

Social and political systems, reflected in the norms, rules, and history of a country or culture yield certain patterns of activity that should be seen across firms and industries. Essentially we argue that similarity in institutional environments makes particular activities more desirable to the firm, because these are seen as more efficient, legal or legitimate. In many nations, certain activities become routinized or 'taken for granted,' that is, they are seen as the natural solution to a problem faced by the firm. This leads to our conclusion that for firms from particular countries, listing on NASDAQ becomes the most logical or obvious choice—the mostly widely accepted or legitimate solution to the problem of how to raise capital.

This approach does not mean that there will not be variation across firms within a particular country, or that firms and actors do not play an important role in choosing the activities that they engage in. Quite the contrary, this approach suggests that the wider system structures, influences, enables and/or constrains firm behavior, but it does not *dictate* it. Firms are not merely pawns of the environment. Agency is very much present and important as firms and the actors make decisions chosen from a series of alternatives on a wide range of topics. Institutional forces[42] influence the availability and feasibility of these alternatives.

These institutional forces serve to help define a choice set for the firm, not prescribe that choice.[43] Identifying and implementing a productive strategy often means being able to acknowledge and take advantage of institutional forces. However, a large variation in firm behavior exists within a given context. Moreover, the context within which firms are making decisions may change radically from country to country and over time. Thus, firm behavior in the context of an institutional framework is influenced, not prescribed. As stated above, individual firm agency is a very important part of this approach. As firms respond to issues; functionality and efficiency concerns are part of the context.

We argue that an 'efficient' solution varies, depending on the context within which the firm is making a decision. With the formulation of a decision representing investment or commitment.[44] The very definition of an 'efficient' response is the result of the environment within which the organization is acting. Therefore, by identifying the institutional environment within which the firm is embedded in,[45] individual firm behavior can be better understood.

Political and legal systems are commonly cited by strategy and international business textbooks when discussing the effects of the general environment.[46] Given all the work that has documented the effects of political regimes on industrial productivity and corporate behavior, it is clearly an important part of the shaping of firm behavior.[47] Additionally, studies in organization theory have suggested that political systems play a direct role in the organization of the firm.[48] Here we extend this work by suggesting that the likelihood of adoption of specific corporate strategies is linked to the relationship of particular political systems across nation-state borders. Thus, we hypothesize that,

Hypothesis 1*A*: Countries with political systems similar to the USA will be more likely to be represented by firms on NASDAQ.

Legal systems are closely aligned with political systems. Types of legal systems vary throughout the world, but they influence the functioning of a firm in numerous ways—from issues of incorporation to acceptable firm behavior. For example, certain legal systems restrict foreign ownership, while others make this not only possible, but also even attractive. Therefore, similarity in legal systems should make the legal requirements of listing easier for the foreign company to understand and address and therefore promote behavior across nation-state borders. As a result we hypothesize that,

Hypothesis 1*B*: Countries with legal systems similar to the USA will be more likely to be represented by firms on NASDAQ.

One of the most powerful sources of values and meaning is national culture. Through culture, events and ideas are interpreted and classified. The interpretation organizations give to activities is highly dependent upon the culture within which they are based. Therefore, countries that share certain cultural traits or identities will be more likely to approach issues and problems in analogous ways. Specific to the context here, firms searching for finance solutions in an international arena will be more likely to look to countries with similar solution sets. Thus,

Hypothesis 1*C*: Countries with cultural systems similar to the USA will be more likely to be represented by firms on NASDAQ.

Throughout the world, the process of colonization transformed many traditional cultural systems. In most cases, the colonizer imposed its institutions and culture upon its colony creating, from a global perspective, networks of countries with similar influences to their own. Many of these institutions have directly contributed to the form of the colonized countries present day political, legal and cultural systems. This leads to,

Hypothesis 1*D*: Countries with a shared colonial history similar to the USA will be more likely to be represented by firms on NASDAQ.

Beyond demonstrating a country to country effect between entities foreign and US, we also are interested in demonstrating whether or not the process of international listing is open to an institutional explanation on a global scale. The expectation of mimetic behavior across players in a field is one of the

fundamental ideas of institutional theory and we test for its presence here by looking at global patterns of equity listing on NASDAQ over time.

Theory suggests that looking at a population over time, patterns of adoption and diffusion of practices across field players may be seen.[49] Within the firms that are constituents of a market there may be a commonality of knowledge in regards to listing of like firms—knowledge as a shared resource, as Powell *et al.*[50] demonstrated in the biotechnology industry, knowledge as a potential source of wealth creation,[51] knowledge as a tacit outcome of the innovation process,[52] knowledge as being also embedded within the organization,[53] etc. The evidence of institutional forces is seen at two levels, at the firm level through the actual adoption of a given practice, and at the population level as the pattern of practice adoption and diffusion occurs over time. It is the pattern of organizational activity as shown through practice adoption that is of interest here. Therefore,

Hypothesis 2: Over time, the number of countries with firms listed on NASDAQ will increase.

Methods

Setting

Firms began listing equity in international markets in force in the 1990s as part of the wholesale finance globalization process.[54] Distinctions in national-level investor markets (e.g. volume and investor risk propensity) prompted such action. In the USA foreign firms have listed most often on NASDAQ,[55] the second largest exchange in the world in terms of dollar value of trading.[56] Foreign companies choose NASDAQ for its flexible listing requirements[57] and the increased liquidity and visibility for stocks in a market-making environment.[58] Major US market alternatives include the New York Stock Exchange (NYSE). The NYSE draws larger, more global firms. Ideally firms listing on NYSE would have been included in this test but data was not available by country.

The decision to list on a foreign exchange requires the firm to meet the participation requirements of the foreign equity market(s). This commitment is substantial in terms of both time and money (e.g. staff time and expenses for application, announcement, marketing, and registration fees). After listing, firms must manage their multiple listings. They must respond to an expanded geographic base of investors, government regulatory systems, financial market officials, and business press in multiple languages and across differing service and performance expectations. Therefore, a firm's decision to sell equity on one or more exchanges is a significant, strategic decision that is appropriate to this investigation.

Sample

Since our concern is with country-level effects we chose for our sample all the countries of the world with a GDP per capita greater than US $2500 in 1998 ($N = 123$). We excluded countries with a GDP per capita under US $2500 since the likelihood of firms of those countries being able to foster and support

companies that would be successful enough to meet US equity listing requirements is minimal. We obtained the GDP per capita information from *The World Factbook*.[59]

To look at the rise and spread of international listing activity within and across countries we identified all the international firms involved on NASDAQ from 1991 to 1998. We felt that this was an appropriate period of study since international equity became a more common method of monetary acquisition in the 1990s.[60] We used 1998 as the year of comparison in regression tests as it was the most recent year of data obtainable.

Variables

Dependent. The concern in this work is the number and type of countries from which NASDAQ-listed firms originate. The dependent variable indicates whether or not one or more firms of a country are listed on the NASDAQ exchange in 1998; 1 = listed on NASDAQ, 0 = not listed. All information about the listing of firms (year of listing, country of origin, type of listing) was acquired directly from NASDAQ.

Independent. To capture the institutional forces that shape behavior, we use several variables. For the political variable, rather than using a specific type of political regime that is often hard to categorize, we follow work that uses the indicators of political freedom and civil liberties to rate a political system.[61] Our data, provided by Freedom House, is on a 1–7 Likert scale with 1 being most free (i.e. the United Kingdom) and 7 being most repressive (i.e. Syria).[62]

To differentiate between legal systems, we used commonly accepted categories[63]—common, civil, Islamic and socialist law—and coded country level information from *The World Factbook*.[64] Then each country was coded as either having a similar legal system to the USA (common law based) or dissimilar (civil, Islamic or socialist based); 1 = similar, 0 = not. For culture, we utilize Hofstede's[65] frequently used categories.[66]

Finally, we suggest that behavior is also informed by a historical legacy, often the result of shared experiences resulting from colonial heritage. This variable is operationalized by identifying the most recent colonial system for each country. The information came from *The World Factbook* 1998[67] and the *World News Digest*.[68] Colonial system was coded as similar to the USA (Anglo-based = 1), or not (other-based = 0).

Control variables. We were concerned that country wealth might confound our findings. Wealthier states are more likely to have well-developed firms that would meet NASDAQ listing requirements. Accordingly, we used gross domestic product (GDP) stated in trillions of dollars (US) as a control variable. This information was obtained from *The World Factbook*.[69] Additionally we used the number of phones in a country, which is a variable commonly used to measure modernization within a country.[70] As with the amount of wealth, we predicted that more modernized countries would be more likely to have firms that list on NASDAQ.

We also included the national level of exports as a proxy for the amount of activity in international markets. We believe that countries with more international activity would be more comfortable in these markets and therefore more likely to have firms that would list on NASDAQ. Both of these variables came from *The World Factbook*.[71] Finally, we controlled for proximity to the USA. One could assume that countries that are geographically close to the USA would have more interactions with it and thus their firms would be more likely to list on an exchange in the USA. Therefore, a dummy variable was created; 1 = Canada and Mexico, or 0 = not.

Analyses

The data on the effect of similarity in institutional variables on listing behavior across countries were analyzed using logistic regression, the method most suited to model the relationship between a binary dependent variable and several independent variables. Therefore, this study examines the effect of several variables on the probability that firms from a country will list on NASDAQ.

We used hierarchical logistic regression so that we could first look at the effects of control variables and then compare the results to a model with institutional variables added. The first model estimates the economic variables of GDP, number of exports, the number of phones and geographic proximity. The second model estimates these plus the effects of political, legal, cultural and colonial heritage systems that are similar to the USA in relation to NASDAQ participation in 1998 by nation.

Results

In Table 1 we report descriptive statistics on the variables. Since most of the institutional variables were dichotomous categorical variables, correlation tables are not provided.

Table 1. Descriptive statistics country listing behavior

	N	Minimum	Maximum	Mean	S.D.
Border	123	0	1	1.76	
Colonial	123	0	1	0.30	
Culture	123	0	1	0.17	
Legal	123	0	1	0.31	
Political system	123	0	1	0.51	
NASDAQ Intl participation	123	0	1	0.28	
GDP (US $ trillions)	123	0.000052	7.610	0.262	0.819
Exports 1997 (US $ billions)	123	0.001	776	0.0046	8980.26
Phones (thousands)	123	890	194 000	29 970	
Valid *N*	123				

Table 2. Hierarchical logit regression results on the dependent variable. Likelihood of national participation on the NASDAQ stock exchange

Variable	Model 1	Model 2
Constant	–1.24	–2.51
	(0.25)	(0.89)
Border	–5.98	–5.75
	(25.92)	(25.27)
GDP	0.0035[a]	0.0024[a]
	(0.0006)	(0.0006)
Phones	5.46	8.23
	(1.23)	(1.25)
Exports	–6.00	–5.50
	(3.65)	(3.65)
Colonial system		0.96[b]
		(0.48)
Legal system		0.67[b]
		(0.44)
Cultural system		−0.01
		(0.05)
Political system		−0.09
		(0.13)
χ^2	12.00[b]	22.12[a]
N	123	123

[a]$p<0.01$; [b]$p<0.05$. Standard errors are reported in parenthesis.

Hypothesis 1

The dependent variable for the logistic regression is countries with firms listed on NASDAQ in 1998. We investigate whether specific national institutional structures similar to the USA would predict NASDAQ participation. Table 2 shows the results of those models.

The first model examines the effects of the control variables on the likelihood of firms of the country participating on NASDAQ. The overall model is highly significant ($p=0.00$). However, the only coefficient that is individually significant is the GDP. It is not surprising that market size would predict likelihood of listing given that countries with larger markets would be more likely to support companies large enough to meet the listing requirements. The second model integrates the institutional variables into the model. The additional predictor variables increase the overall fit of the first model. As shown, the χ^2 increased from 12.008 in the first model to 22.124 in the second model, with a significant improvement of fit at the 0.05 level.

The effects of colonial heritage on national participation, is positive and significant. The coefficient indicates that countries that were British colonies are significantly more likely ($p=0.05$) to have firms that participate on NASDAQ than countries with different colonial systems. This finding supports hypothesis 1D.

Table 3. Number of countries with NASDAQ issues

1991	1992	1993	1994	1995	1996	1997	1998
20	24	25	22	24	29	29	31

The second variable tests the effects of the legal system. We argued that similarity in legal system would be an important factor for country level participation and firms with similar legal systems will be more likely to list. This variable is significant ($p = 0.05$) with a showing that countries with legal systems more similar to the USA are more likely to list on NASDAQ. This finding supports hypothesis 1B.

The variables for similarity in the political and cultural systems were not significant. Possible reasons for the lack of significance will be presented in the discussion section.

Hypothesis 2

Table 3 shows the number of countries represented on NASDAQ from 1991 to 1998. Over the 8-year period the number of countries increased by almost a third, beginning with 20 countries in 1991 and ending with a total of 31 countries in 1998. Thus, this data provides support for hypothesis 2—that over time, the number of countries with firms listed on NASDAQ will increase.

Discussion

The data on international listing activity supports our argument—wider social and culture forces do influence strategic choices. The data provides support for the hypotheses that similarity in legal systems and a shared colonial heritage will influence positively the probability of a country having firm participation on NASDAQ, a leading listing site for technology-orientated companies. Neither culture nor political systems are significant in the model. Culture may not have been predictive because cultures are so intermingled and varied around the world and as a result it is often difficult to establish the degree of similarity between cultures using national boundaries. One impact of globalization is the difficulty in separating similarity and differences between cultural systems by country. As a result, the present cultural indicators may not be fine-grained enough to pick up the similarities that might affect strategic behavior. Additionally, the variables colonial heritage and legal system may be capturing some of the variation. Moreover, Hofstede's cultural dimensions may not be capturing the values and attitudes that are necessary for capitalist institutions to flourish. In this case, the legal and colonial heritage may be more appropriate culture indicators because of the influence that they have had on different major national institutions. Given the anecdotal work on the importance of culture to strategy, more work should be done to explore this issue.

The fact that similarity in political system was not a significant predictor in the likelihood of a firm from a country listing on NASDAQ is surprising. A

related consequence of globalization is the increasing permeability of state boundaries and the difficulties of establishing political systems at the nation-state level. Recent trends towards regionalization may have confounded our findings. Moreover our measure of political system took into account the amount of freedom in a political system. Although many people have argued that a more open society will promote modernization and development, which would lead to more listings on NASDAQ from these countries, this measure was not supported. Perhaps, as with culture, the legal and colonial heritage was picking up some of this variation for political system. Clearly it is very difficult to separate legal, cultural and political systems from each other since they are interrelated and influence each other. Thus, political processes may be affecting strategic behavior in a variety of ways in which the measure we used is not picking up.

The results indicate how the effects of institutional forces are not static processes; not only did the number of foreign listings increase over the eight years of this study but the number of countries involved did as well. Institutional forces diffuse across firms and across countries; however, as the data suggests, the firms involved in this process are from countries that share traditions and legacies that influence their choices. Perhaps the most important point that this study makes is to demonstrate the influence of the macro environment on strategic behavior while also recognizing the agency of the firm. Obviously not all firms in a country obtain equity through international listings, so we infer that firms engaged in this activity are making an active choice to gain funding in this way.

As we expected the wealthier states were more likely to have well-developed firms that would meet NASDAQ listing requirements. Accordingly, the gross domestic product (GDP) was positively related to listing. The firms from these nations have access to the infrastructures or resources necessary to pursue listing on the NASDAQ.

This research has limitations. We only have eight years of data so we were unable to track when firms initially listed and entered into the data set. As a result, we had no way to assess performance over time or to determine if there are industry, legal, or strategic reasons for their listing behavior. In the future we would like to explore these questions further.

Nevertheless, we believe that this research represents a first attempt to remedy a gap in the strategy literature by looking at whether and how institutional forces play such a large role in the activities of firms. Our results suggest that this is indeed the case. Additionally, by taking a multidisciplinary approach, we demonstrate how research in several domains can help understand the phenomenon of firm behavior.

Opportunities for Future Research

The blending of institutional approaches with strategy and international business will help practitioners and academics better understand how firms participate in the global economy. Since our results imply that patterns across countries do occur, numerous questions arise that deserve future research. These have the potential to move in several directions. First, we would like to expand our study

to show how these dynamics work in other contexts. International capital is a relatively mobile phenomenon, will these findings be replicable for other types of international behavior, such as decisions around foreign direct investment or merger activity? Second, we would like to place this practice within a broader context—the connection between equity and other strategic action on an international scale should also be addressed. Since we argue that equity listing is more than a way for companies to obtain capital, we would like to explore the motivations for listing on foreign exchanges more fully. One way to do this would be with a series of interviews or surveys with CEOs, CFOs, and other critical decision-makers of international companies who are listed on NASDAQ. Such a study would explore the reasons behind their decision to list. Specifically, we would be interested in the behavioral as well as financial reasons behind any equity listing decision. Such studies would enable us to look directly at the firm's financial choices as part of a larger, overall strategy of the firm.

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