Does Prior Experience Really Pay? Institutional Environment Relatedness and Foreign Direct Investment Failure in the Brazilian Telecommunications Industry

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ABSTRACT

This study provides an in-depth re-examination of the foreign direct investment (FDI) conventional wisdom, which suggests that having prior experience with foreign investment leads to subsequent performance improvements. This thesis challenges this theoretical view with evidence demonstrating that experienced firms often fail. The overarching conjecture suggests that prior FDI experience can have both positive and negative effects on firm performance, given the level of similarity to the target country's institutional environment. Moreover, firms with similar prior institutional experience are more successful because of their ability to: 1) select better projects before entry, 2) accurately predict cash flows and 3) mitigate exposure to market volatilities. Institutional similarity is operationalized as a firm's prior experience in heterogeneous regulatory environments in 80 host countries. By utilizing field studies on telecommunications regulation, executive interviews (conducted in Brazil, Spain, Portugal and the U.S.) and a uniquely constructed FDI dataset, a knowledge acquisition theoretical framework is developed to explain the mechanisms of prior experience that drive performance. Empirical tests examine the impact of firms' prior experience on foreign investment performance in the Brazilian telecommunications industry from 1997-2004. Results indicate that experienced firms are four times more likely to fail when the experience is unrelated to the target investment country's regulatory institutional environment. This research contributes to our understanding of institutional environment experiential learning effects and the direct impacts on firm performance.

1. Introduction

As global economies expand, a growing number of multinational firms acquire experience in heterogeneous host country institutional environments. We should expect experienced firms to benefit strategically as foreign direct investment (FDI) theorists contend that prior foreign investment experience leads to subsequent performance improvements. Several empirical studies on foreign investment bear out this result (i.e., enhanced survival, Shaver, Mitchell, & Yeung, 1997; Li, 1995; Barkema, Bell & Pennings, 1996). Beyond the context of FDI, other organizational learning studies have consistently demonstrated similar effects of enhanced performance from prior experience (for a review, see Argote, 1999; Huber, 1991; Levitt & March, 1988; Argote & Kane, 2003). However, despite this widely accepted view, this research demonstrates that experienced firms frequently fail. This study unravels this puzzle to reveal the conditions under which prior experience leads to performance improvements.

To contextualize this problem, consider this example. In August 1999, *AT&T*, the global telecom giant, entered the Brazilian telecommunications industry with the strategic intent of "investing for growth".[1] However, by 2003, AT&T exited the market because of consistent losses caused by grossly overestimating earnings projections for five consecutive years.[2] Alternatively, a Mexican competitor, *America Movil*, entered the Brazilian telecommunications market during this same period and immediately realized profits in the first year and within three years became one of the national market leaders. What is particularly pertinent to both of these examples is the counterintuitive relationship between the firms' level of prior foreign investment

[1] As stated by *AT&T*'s CFO Charles Noski in a company press release dated September 15, 2000, "AT&T Latin America's strategy is all about investing for growth."

[2] *AT&T's* horrific downfall was evidenced by unexpected losses of $64MM, $63MM and $122MM in 2000, 2001 and 2002 respectively. Corporate headquarters floated the losses for three consecutive years. However, in 2003, unexpected losses resulted in corporate headquarters refusing to provide additional funding and the external market declined additional funding due to poor performance. By November of 2003, AT&T Latin America was delisted, filed bankruptcy and sold off its assets to its competitors.

experience and their performance outcomes. Comparatively, *AT&T* had prior experience in 20 countries before entering Brazil, while *America Movil* had little exposure to conducting foreign investments abroad.[3]

In further examining FDI into the Brazilian telecommunications industry from 1997-2004, descriptive statistics reveal evidence of systematic failures[4] among experienced multinationals (i.e., Sprint, Bell South, Bell Canada, *etc*.). Only 21% of successful foreign telecommunications firms in Brazil were experienced[5] while the remaining 79% of successful firms were non-experienced (see Table 1). More strikingly, 53% of the failures were from experienced firms. These counterintuitive findings are largely unexplainable by the existing conventional wisdom on foreign investment, which suggests that further disentanglement is necessary to explain the relationship between prior experience and subsequent performance. The aforementioned examples convey that having FDI experience is not a sufficient condition for improved performance. Rather, it seems that the right type of prior investment experience is necessary to achieve subsequent performance benefits. The extant literature on FDI (Johanson & Vahlne, 1977; Davidson, 1980) suggest that market specific knowledge enables firm success, but little explanation is provided about the mechanisms that succinctly connect a firm's experience to the subsequent performance outcomes. Thus, a study is warranted to further examine both the types of experience that lead to subsequent performance improvements and the specific mechanisms that drive investment success.

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[3] At the time of investment into Brazil, *America Movil* only had two foreign investment experiences outside of its home country Mexico.

[4] Failure is defined as a market exit not resulting from acquisitions, regulatory shifts, geographic consolidation, etc. For a more detailed account of how failures are coded, see section 3.4.1.

[5] Experience here is measured according to the conventional wisdom as cumulative FDI experiences (subsidiary locations) outside home country. This study redefines this measure in subsequent theoretical arguments as similar institutional experience derived from a firm's home or host country investment and find dramatically different results.

This paper explores both of these considerations. A conceptual framework that draws upon a triangulation of methods (i.e., field research case studies on telecommunications regulation, executive interviews conducted in Brazil, Spain, Portugal and the U.S., and two uniquely constructed FDI datasets) is used to examine the effects of firms' prior FDI experience on subsequent investments into the Brazilian telecommunications industry. The baseline assumption of this paper (a departure from the existing literature) suggests that experience can have divergent effects on firm performance, depending on the level of relatedness. The overarching hypothesis suggests that firms with similar institutional experience are more likely to succeed, while firms with dissimilar institutional experience are more likely to fail. Three distinct mechanisms drive the success of firms with similar experience: their ability to 1) select better projects before entry, 2) accurately predict cash flows and 3) mitigate exposure from market fluctuations. This study operationalizes institutional similarity as a firm's regulatory experience acquired throughout their investment history. Utilizing the regulatory distance measures constructed by Perkins (2006), I compute a firm specific distance measure, which captures the gaps between a firm's prior experience in both home and host countries versus that of the target investment country (Brazil) to predict the firm's likelihood to succeed.

The key contributions of this paper provide scholars and practitioners two valuable insights. First, experience can hinder firm performance. Firm experience that is not relevant to the target investment country's institutional environment is likely to hurt shareholder value by utilizing inapplicable assumptions in investment decision-making. However, firms that acquire unique patterns of sequential investment can potentially leverage their knowledge of idiosyncratic institutional environments as a source of competitive advantage. The challenge for foreign investment managers is to recognize the similarities across key institutional dimensions

in their investment portfolio to enable deployment of related competencies. Secondly, a broader insight of this study has implications for the yet to be resolved variation in organizational learning curve arguments. The unaccounted for heterogeneity in firms' experience also provides an alternative explanation for why firms have differing learning curves.

This paper proceeds in the following manner. The next section presents theoretical arguments on prior experience. Following, a discussion is provided on the empirical setting, methods and measures used to test the hypotheses. The paper concludes by demonstrating results that support the hypotheses and provides implications for future research on foreign investment and organizational learning.

2. Theoretical Discussion

There are two main hypotheses that are empirically tested separately. The first hypothesis argues that firms with prior experience in similar institutional environments are more likely to succeed than firms with less similar experience. I operationalize experience as knowledge acquired in global regulatory environments. The second hypothesis suggests that the mechanisms driving the successes of experienced firms differ in the level of accuracy in both decision-making and risk mitigation abilities.

2.1 What is Foreign Investment Experience?

It has been shown that firms with more experience are likely to benefit from performance improvements because of their ability to efficiently mitigate the risk inherent to foreignness.[6] Experienced firms are more adept at mitigating uncertainties because of their ability to foresee the inherent challenges of the host country environment based on previous FDI experience. The

[6] Scholars (Johanson & Vahlne, 1977; Davidson, 1980) have theoretically built arguments that suggest the benefit of prior FDI experience is the ability to use this market specific knowledge in subsequent ventures. Shaver, Mitchell & Yeung, (1997); Li, (1995); Barkema, Bell & Pennings, (1996) have all demonstrated that in fact experienced

primary rationale for such expectations suggests that more experienced firms possess higher degrees of market-specific knowledge, which reduces the level of uncertainty and thus increases their level of accuracy in entry and operating decisions (Shaver, Mitchell, & Yeung, 1997). However, there are many types of experience that a firm acquires from conducting foreign investment. It is not conclusive whether all experience leads to future performance improvements at the same propensity. The precedent in the literature for capturing experience is contextualized as a frequency of reinvestments in a single host country. This approach limits understanding how experience acquired in other countries may affect subsequent investments. It also constricts the ability to distinguish between performance effects driven by repetition[7] (i.e., learning curve arguments based on production efficiencies) versus variation in types of experience (i.e., institutional heterogeneity).

This thesis argues that there are two primary types of experience that firms acquire in conducting foreign investment. Firms gain experience from FDI by learning to efficiently estimate the *tangible* requirements of conducting business in a country such as property, plant and equipment planning, consumer profiling, purchasing, hiring of foreign nationals and other market-based factors. These types of investment requirements can typically be estimated more precisely as they leverage the routinized skill-based capabilities of the firm. Zander and Kogut (1995) postulate that these routinized firm capabilities that are easily codified and teachable are highly transferable. So expectedly, multinational firms should be able to transfer knowledge related to the tangible foreign investment requirements across sequential investments. Given

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firms are more likely to survive than the less experienced. Experience has also been shown to have other performance benefits such as higher profitability (Luo & Peng, 1999).

[7] Organizational learning theories suggest that firms that increase repetition of a task will benefit from productivity efficiencies or more efficient outcomes, thus learning curve effects. See Argote (1999), Chapter 1 for an overview of the learning by doing, learning curve literature.

these are tangible expenditures, there is also a higher degree of certainty in the cost structure which also reduces estimation errors *ex ante* foreign market entry.

As firms increase the frequency of foreign investments, they benefit from performance improvements proportionally as they accelerate down the learning curve. Such repetitive task cumulative effects have been proven in several organizational learning curve contexts (i.e., reduced production inputs, Dutton et al, 1984; reduced unit cost, Argote & Epple, 1990; reduced procedure times, Pisano, Bohmer and Edmonson, 2001; acquisition efficiencies, Hayward, 2002; Haleblian & Finkelstein, 1999). This argument parallels what has been proven in the existing FDI literature. Firms that have repeated investment experience in a given host country are more likely to survive (Shaver, Mitchell and Yeung, 1997) and are more profitable (Li, 1995). However, all knowledge acquired and transferred in foreign investments is not easily replicated. Some information sources acquired in global markets have greater degrees of variation.

A second source of experience can be gained from the *intangible* aspects of foreign investments such as the idiosyncratic institutional environment. These aspects of knowledge acquisition include non-market factors of the environment such as a firm's ability to manage expropriation risks of local governments and partnering firms (Perkins, Morck & Yeung, 2006), manage the variations in the regulatory environments, or know which local governmental officials to bribe to improve their capacity to operate in the country.[8] These factors are typically more difficult to observe and predict because of the vast heterogeneity of institutional practices across countries. Knowledge-based theorists (Kogut & Zander, 1993; Zander & Kogut, 1995) suggest that knowledge that is difficult to codify and is more complex in nature is harder to transfer. This could pose problems for multinationals seeking to share knowledge of the

institutional environment across subsidiaries in disperse geographic locations. Without having any relevant similar experiences, a firm could grossly misestimate the effect of such institutional parameters on their business. Because of the inherent heterogeneity of country-specific factors, it is more challenging for firms to identify and build in-depth competencies across each type of experience over time.

This paper focuses on the latter of these two types of experience. It is concerned with the effects of prior experience acquired in heterogeneous institutional environments on subsequent investment decisions. Firms' success in host countries hinges on their knowledge of the institutional dimensions including the political and governmental structures, laws, regulations and means of social interaction that have the ability to effect the appropriation and expropriation of firm cash flows. North (1991; pg 97) effectively defines the institutional environment as "humanly devised constraints that structure political, economic and social interactions. They consist of both informal constraints (sanctions, taboos, customs, traditions and codes of conduct) and formal rules (constitutions, laws, property rights)." The challenge for foreign investment managers is precisely predicting these institutional variations across investments.

Recent empirical studies on FDI reveal some of the institutional environments that affect firms' foreign investment strategies. More specifically, Henisz (2000) finds that country-level political hazards directly affect strategic entry choice and local partner selection; Kogut & Singh (1988) demonstrate that cultural distance affects foreign investment entry mode; and Zhao (forthcoming) demonstrates that property rights protection affects global R&D sourcing strategies. All of these studies find that foreign firms strategically navigate the institutional environment to avoid market uncertainties and expropriation risks. However, other aspects of

[8] For example, Henisz (2000) suggests that firms entering global markets with a high level of political hazard (as measured by corruption and direct taxation to multinationals) are better off entering the market as a minority joint

both the formal and informal institutional environment remain sufficiently understudied. There is little known about the effects of several components of the institutional environment on FDI performance including: regulatory conditions; laws; corporate governance structures; and the behavioral norms that generate culture. This paper will critically examine the effects of the formal regulatory institutions on firms' FDI performance. Admittedly, not all of the above-mentioned institutional components are mutually exclusive. Hence, I include the known institutional variables as measures of control to tease out such previously studied effects (i.e., cultural distance and political hazards; see section 3.4.3 for details on alternative explanations).

2.2 Regulatory Institutions and FDI Performance

The distinct contribution of this study is to develop an approach that precisely measures the differences in regulatory environments across nations and captures firms' prior experience in each host nations ex ante entry in Brazil. Before I delve further into this approach, it is necessary to understand why regulation is so important to allow for better contextualization of this research. The historical focus of FDI theory is rooted in the industrialization of manufacturing firms globally (Buckley and Casson, 1976). However, the last few decades of foreign investment represent expansive growth of service industries (i.e. energy, airlines, telecommunications, banking and other government services) fueled significantly by market privatizations and liberalizations of formerly state-owned and operated industries.[9] The implications for understanding regulation are immense as these competitive services are some of the most highly regulated industries; foreign investment managers need to proceed with caution, as rapid isomorphic growth without institutional understanding can be detrimental to firm success.

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venture with a local partner to avoid governmental expropriation, but are subject to private partner expropriation.

To this end, I build upon the insights conveyed by Shaver, Mitchell & Yeung (1997) which infers that *related* experience matters. Their research shows that firms are more likely to survive given the existence of their own prior investments in the country and competitive foreign entries in the host country. This key insight suggests that not all experience will lead to increased survival; but those experiences that relate to the given market context and leverage existing knowledge are likely to positively affect firm performance. This thesis argues that firms with experience in related institutional environments will benefit because of the similarities in the market context and thus have a more precise ability to predict and mitigate the institutional conditions. For example, the telecommunications regulatory laws are very similar in Brazil and Spain in comparison to the regulatory laws of the U.S. and Japan, which have more extensive and enforceable regulatory competitive market structure rules. The similarity in experience allows firms to understand the context of business norms and regulatory rules and practices resulting in more efficient and effective strategic decision-making. A foreign telecommunications executive from a regulatory environment similar to Brazil illustrates the point:

"The most important factor in being able to survive in the Brazilian telecom market is the ability to manage through crises; …companies coming from Latin markets are much more used to living through unstable situations. If you compare this market (Brazil) to Italy, Spain or Portugal prior to the E.U., the background of managing business is very similar in terms of the political, economic and regulatory instability."

Thus, we can expect that firms that have acquired experience from similar institutional environments will be more likely to succeed while firms that have dissimilar experiences are more likely to fail because of their lack of relevant knowledge of the market context.

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[9] For a more thorough explanation of the "new market economies" that resulted from global privatizations and liberalizations, see Emmons, 2000.

2.3 Mechanisms Driving Performance

This section discusses the mechanisms linking similar prior experience to performance metrics that positively influence survival. Firms with similar experience have a strategic advantage over firms with dissimilar experience in that they benefit from efficiencies gained by having acquired the right type of knowledge. Foreign investment theory provides two primary explanations for these experiential learning effects. One is that experienced firms benefit from enhanced risk mitigation. The other suggests that experience positively affects subsequent strategic decision-making (i.e., firms effectively avoid poor investment choices). This paper builds on both of these arguments by identifying the specific mechanisms that lead to performance improvements.

Often we presume that managers use a sophisticated capital budgeting model to estimate the investment parameters for future investments.[10] The implicit assumption is that managers are optimizing rationally by precisely seeking investments that provide the highest rates of return at the lowest level of risk. However, *ex post* results demonstrate that frequently such predictions fail. Such occurrences can be explained by the gaps in firms' knowledge, which I refer to as *knowledge voids*. This exists when a firms *inherited knowledge* or the *congenital knowledge* sources do not provide sufficient knowledge combinations to fill the void. In these cases, decision-making heuristics are used from dissimilar experience in which the knowledge was acquired in an alternative context. Thus, failure occurs when the wrong knowledge has been transferred combinatively in a mismatched environment.

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[10] The assumption is that firms assessing FDI opportunities ex ante entry are using some form of a net present valuation model (NPV), $NPV = C_0 + \frac{C_1}{1+r} \ldots + \frac{C_n}{(1+r)^n}$, to quantify wealth maximization opportunities for the shareholders.

I posit the three mechanisms of the risk mitigation that will vary given a firm's prior experience in a similar institutional environment are the: 1) ability to accurately predict cash flows, *C*, 2) ability to select better projects resulting in more selective entry, and 3) ability to mitigate exposure from market volatility.

2.3.1. Accuracy in Generating Cash Flow

First, firms with similar regulatory experiences benefit from more realized cash flows because of the accuracy in *ex ante* predictions. Thus, these experienced firms understand the regulatory laws, structures and agents' behavior and account for such behavioral norms in the investment valuation. For example, if we compare a fundamental telecommunications regulatory entry barrier, such as interconnectivity in two countries, the laws vary dramatically. In the U.S., the Federal Communications Commission (FCC) Under Section 251 of the 1934 Communications Act states: *"Carriers are required to interconnect directly or indirectly with the facilities and equipment of all other carriers. All services must be made available to competitors for resale, and local exchange carriers (LECs) must offer any service that is offered to customers to other telecommunications carriers"* [11]. By law, firms have to share their physical assets with competitors to provide telecommunications services to the end customer. In the U.S., compliance of this law is maintained through the credible threat of regulatory enforcement and sanctions (i.e., loss of license, fines, etc.). However, in Brazil, the regulatory law and responsibility of the regulator varies and has significant implications for firms. Brazil's regulatory authority, *ANATEL*, at the inception of this study did not posses legal authority to force incumbent firms to share assets. The General Telecommunications Law (*Lei Geral das Telecomunicações*), Law 9.472 of July 16, 1997, laid the foundations for market privatization

[11] Quoted from the Espicom Business Intelligence National Regulatory Authority Worldwide Report, 2002; pg 16.

and liberalization from a state-owned monopoly which stated that *ANATEL*'s responsibilities include monitoring interconnection agreements and arbitrating between service providers. Moreover, given *ANATEL*'s role as an arbitrator of interconnectivity competitive concerns, there are no enforcement and compliance mechanisms that punished the incumbent firms from lack of cooperation. If multinationals do not take into consideration such heterogeneity in regulatory law and enforcement and the probabilities of those laws changing over time, the uninformed firms can grossly misestimate the expected value of the investment. An executive from a firm that mispredicted the regulatory conditions stated:

> *"Interconnectivity is a big issue here in Brazil. ANATEL promised us interconnectivity with the big incumbent firms, but it has not happened after a year and a half. Our business is suffering as we expected those revenues. We could have made a lot more money if we figured out how to get ANATEL to regulate the unbundling issues for the mirrored licensees."*

The inability to predict how shifts in laws, adapt to varying institutional structures, or identify changes in normative behaviors of doing business with government regulatory officials can create large discrepancies in predicted cash flow versus the performance results ex post entry. A firm's ability to accurately predict cash flow directly affects performance. This ability not only affects first period of the investment, but consequentially affects the firm's ability to generate cash for future phases of the investment as well as its ability to pay off outstanding debts. If the forecasted risk of institutional variations is underestimated before entry, firms will suffer from cash management issues. For example, AT&T's Brazil operations, despite their foreign investment experience in 20 prior countries, repeatedly under predicted their cash flow requirements for three consecutive years because of inaccurate market knowledge. Fortunately, for the Brazilian subsidiary, the parent company relieved this error through continual unplanned

capital infusions. However, after the fourth consecutive year of the same error in prediction, the parent company denied additional capital request. Due to the continually poor performance, AT&T also has limited options to secure additional capital from financial markets. These cash management problems led to their bankruptcy, the sell-off of assets, and market exit in Brazil.

This inaccuracy in mitigating the investment risk creates problems in two manners. The initial forecast of discounted cash flows is inaccurately projected in periods $t_1 \ldots t_n$ because of a mismatch in institutional knowledge. Consequently, future payoffs will fall short and suffer from forecasting error based on prior knowledge in period t_0. Underestimations of the initial cash outlay forces the firm to infuse the investment with unexpected capital, which strains future cash needs in subsequent periods. This cycle of misestimation repeats itself in each period unless the firm has the ability to *learn-by-doing* in periods $t_1 \ldots t_n$ and update their priors in the next period. These two problems combined are likely to leave the firm with cash management shortcomings that become insurmountable to recoup. Unless they are able to recoup from these inaccuracies over time, a firm will likely exit the market. Firms with more similar institutional experiences have a greater ability to generate positive ex post cash flow than firms with less similar experience. In addition, we can assume that the greater the number of similar institutional experiences, the higher propensity for accuracy in risk mitigation.

2.3.2 Better Project Selection

Some firms can foresee such situations *ex ante* entry and decide to avoid investment in the target country completely. Because firms that have similar institutional experience will be accurate in their valuation predictions, they also benefit by having a greater ability to select the best projects. They are more able to 1) clearly assess the projects with better payoffs, 2) determine the degree of potential risk from the institutional environment, and 3) utilize the entry

strategies that are most effective given the target countries' institutional limitations. These combined effects allow experienced firms to make better foreign investment selection decisions. Firms with experience have a greater ability to avoid undesirable investments more efficiently because of their more in-depth understanding of the regulatory institutions. For example, an executive from a firm from a very similar regulatory environment revealed their investment selection strategy, which leveraged their knowledge of the market specific regulatory conditions:

> *"You have to be smart about your investment decision. We only buy the incumbent properties. This way, you are guaranteed the network and the regulatory policies are usually already set in your favor. Many of the people that now run ANATEL were previously from Telebras (state-owned incumbent operator) so that works to our favor when getting things done at ANATEL."*

Given that similar institutional experience allows firms to better understand the strategic benefits of investment projects more clearly, this should also result in performance benefits. Thus, firms with similar experience are more likely to pay less or a fair market price of an investment than firms with little or dissimilar experience. In their case, the inexperienced are likely to select the least financially attractive investment and pay a market premium.

2.3.3. Less Exposure to Market Volatilities

The prior two arguments reference the resulting effects of managerial decision-making prior to entry. Firms' level of accuracy in predicting cash flows and selecting projects reflect their ability to foresee anticipated market expectations. While these mechanisms directly affect *ex post* performance, a third mechanism focuses on the firm's ability to respond and adapt to unforeseen market fluctuations that may occur during the life of the investment. For example, many foreign investments are susceptible to higher market risks due to the unpredictability of market shocks such as frequent regulatory shifts, changes in governmental regimes,

hyperinflation or currency crises. While firms typically approximate the likelihood of such events and utilize hedging strategies to safeguard the firm from negative effects, firms that have lived through such aforementioned market volatilities are better exposed and adapt better risk mitigating strategies. There is little substitute for having experience with market shocks and utilizing this institutional specific strategies to mitigate through crises. For example, the Brazilian telecommunication regulatory faced several market shocks on an annual basis – 1998, unplanned loss of general director lead to political turn over; 1999 currency devaluation of 50%; 2000 market with 10 legal shift in regulation, and so on. To illustrate this point, consider the following regulatory fluctuations.

The foreign investment manager that experienced similar experience regulatory instability in previous countries stated:

> *"The most important point for foreign companies investing here in Brazil is their ability to manage crisis. [We] are in constant crisis. Regular changes in Brazil's political and regulatory environment create challenges; Fluctuations are normal. We are used to this because we have seen it in other countries. So we know what to do in these cases. Since [we] entered here in 1998, we've had at least three very strong shifts in a six year period."*

Alternatively, the investment executive with dissimilar experience from a more stable regulatory environment stated:

> *"Our business did well in the beginning under the leadership of Sergio Motta, the former head of ANATEL. He advocated for regulations to make the playing field fair for foreigners. We had a positive EBIT in the first quarter. Then things suddenly changed when the regulators at ANATEL and the Congress change. The politics and political climate changed. Our advocates [at ANATEL] died off; now all of a sudden, the government is against us. It is hard to get anything done through ANATEL any more. Our business has really suffered because of this."*

This suggests that firms with similar institutional experience will be more efficient at mitigating risks related to their investments during such market shocks. Their prior knowledge and familiarity with such types of occurrences provides experienced firms an ability to have realistic expectations of the level of market inefficiencies and likely not as surprised by fluctuation. They are better able to combine their prior knowledge and construct an effective strategy that suits the current situation to influence change in the failing market systems. Thus, firms with experience should have less deviation from their projected performance than firms with less relevant experience during volatile market events.

2.4 Measuring Regulatory Similarity

Thus far, this paper has discussed regulatory similarity, but not yet provided sufficient measurement to capture each firm's regulatory experiences globally. I construct a methodology by first utilizing the measures developed by Perkins (2006) that precisely capture regulatory environments in 80 countries. This study posits that industry regulation is a function of the laws, (i.e., competitive market structure rules such as pricing, technology selection, etc.), regulatory agency structures' ability to impose compliance on firms and the political power of the regulators. She suggests that when regulators' power is not mitigated by political competition, imbalances can foster corrupt behaviors that allow firms to circumvent the laws. Perkins (2006) captures six key dimensions of regulation that explain 78% of the variation in key regulatory measures across 80 countries (see Tables 12 & 13 for a more complete examination of these measures and dimensions of regulation). These six dimensions include 1) *regulatory competitive market structure*, 2) *regulatory standards*, 3) *regulatory political competition, 4) regulatory tollboothing,* 5) *regulatory entry barriers* and 6) *regulatory stability*. These regulatory

dimensions are arguably the most challenging areas of adaptation for multinational firms as they represent the largest regulatory variations across nations.

These dimensions capture the variations in types of prior experience (i.e., dimensions across countries) for each firm. I calculate a firm's prior home and host country institutional experiences versus that of the target country's (Brazil) regulatory environment by using a two-step method. Regulatory distance (d_i) is captured by measuring the level of similarity between each country, j, and that of the reference country Brazil. Each country's regulatory dimensions are captured in the column vector X_j such that,

$$X_j = \begin{pmatrix} reg\_ce\_\_standards_j \\ reg\_ce\_competiton_j \\ corrupt\_polcomp_j \\ corrupt\_tollboth_j \\ reg\_stability_j \\ reg\_entrybarriers_j \end{pmatrix} (6x1),$$

and the target country's dimensions are captured in the vector Y_j such that,

$$Y = \begin{pmatrix} reg\_ce\_\_standards_Y \\ reg\_ce\_competiton_Y \\ corrupt\_polcomp_Y \\ corrupt\_tollboth_Y \\ reg\_stability_Y \\ reg\_entrybarriers_Y \end{pmatrix} (6x1).$$

A Mahalanobis measurement technique is specified, instead of a Euclidian distance, because of the known correlation between the six regulatory dimensions. To illustrate this point, for example, a country's regulatory laws are not completely independent of the government's ability to mitigate corruption within the regulatory agency. If corruption occurs, the enforceability of laws potentially becomes more volatile as the regulators power becomes stronger. The Mahalanobis specification adds robustness by taking into account not only the means across countries, but accounts for the variances and covariances within each dimension of

regulation, in the inverse covariance matrix, $S^{-1}_{(6x6)}$. The calculation captures the squared distance,

$$d_j = \underset{(1x6)}{\left(X_j - Y\right)} \underset{(6x6)}{S^{-1}} \underset{(6x1)}{\left(X_j - Y\right)'}, \text{ where } j = 1 \text{ to n, for each country } j.$$

See Figure 1 for a graphical representation of this comparative distance measure.

This regulatory distance, d_j is piled up across each country such that $d_j(\forall_j)$ generates the vector $D = \begin{bmatrix} D_1 \\ \dots \\ D_n \end{bmatrix}$ for all countries j. This vector provides comparative distance measures for each host country and Brazil. However, the measure of interest is at the firm level of analysis. Therefore, an additional step is added to the method.

For each firm, i, I capture the global portfolio of investments prior to entering Brazil ($t \leq 1997$):

$$P = [p_{ij}] = \begin{bmatrix} 0 & 0 & 1 & p_{1n} \\ 1 & 0 & 0 & p_{2n} \\ \dots & \dots & \dots & \dots \\ 0 & 1 & 0 & p_{kn} \end{bmatrix}, \text{ (kxn) where } i = 1, 2, \dots, \text{k and k is the number of firms and } j =$$

1, 2, …, n and n is the number of countries.

To populate $\boldsymbol{P}_{nxk}$,, the systematic coding of one (1) equals headquarters or subsidiary investment presence and zero (0) for no investment presence of firm i in country j[12]. To determine firms' average type of experience, I simply multiply the $\boldsymbol{P}_{(kxn)}$ matrix by the $\boldsymbol{D}_{(nx1)}$ vector and average the summative scores as a crude measure of firms prior experience. This average assumes all experiences are weighted equally. Admittedly so, this basic computation dilutes the types of range in experience, home country versus host country effects, and the duration effects within

[12] Firm level subsidiary data was obtained from the Dunn & Bradstreet Million Dollar Database – International; the Gale International Business Locator; and company annual reports and websites.

countries. Thus, the method is refined by weighting the computation for both home and host country experiences such that *Firm Mahalanobis Distance*:

$FMD_i = \sum_{j=1, j\neq h}^{n} w_{i,j} p_{ij} d_j + w_{i,h} p_{ih} d_h$, where h=home country and j = all other countries with prior experience and the $\sum_{j=1}^{n} w_{i,j} = 1$. The following explains the $\{w_{i,j}\}$ weights.

Home Country Effects

A firm's home country experience represents the firm's *inherited knowledge* of the business practices and norms that existed prior to foreign expansion. These practices are deeply ingrained in the organization and are heavily relied upon particularly by foreign investment managers that report to the headquarters location. I argue that firms' home country effects have the strongest impact on firm performance. Several scholars (Kogut & Singh, 1998; Benito & Gripsrud, 1992; Erramilli, 1991; Barkema, Bell & Pennings, 1996) in the foreign investment research tradition use home country to measure proximity to the target country. Home country knowledge effects are replicated by using the above *FMD* measure for each firm where $w_{i,h} = 1$ and $w_{i,j} = 0 \ \forall j$.

Host Country Effects

Huber (1991, pg 91) argues that *congenital knowledge* is a combination of both *inherited knowledge* acquired from the owners at birth and other information the firm acquires before the initial investment period. This description of knowledge acquisition is directly relevant to multinationals' knowledge base prior to investing in the proximal target country. During this ex ante prediction period, key assumptions are directly inputted into foreign investment valuations. Firms rely on *congenital knowledge* to source information on which countries they will invest in, what inherent capabilities the firm has and what resources they will deploy in the targeted country environment. Given that firms decide to enter a country based on *congenital knowledge*

sources, firms also acquire additional knowledge by *learning-by-doing* (or experimental learning; Huber, 1991) ex post the entry decision. I measure both of these knowledge sources by shifting the weights between home to host countries where $w_{i,h} = 0$ and $\sum_j w_{i,j} = 1$ and all host country investment are weighted equally.

Combined Knowledge Effects

In many multinational corporations, foreign expatriates often rely on the corporate headquarters and vice versa. True multinationals and transnational firms are able to learn from global operations. Often, knowledge is transferred in these firms through the movement of managers from one subsidiary location to another (Almeida & Kogut, 1999). In these cases, both home and host country knowledge acquired are likely intertwined and have combined effects on firm performance. As a baseline assumption, the home and host country experiences are weighted equally in the *FMD* calculation where $w_{i,h} = 0.5$ and $\sum_j w_{i,j} = 0.5$.

The measurement methodology above presents a challenge in interpretability of the influence of firms overall experiences. Firms which have multiple foreign investment experience (in the case of AT&T) that might be both similar and dissimilar to Brazil can possible be underspecified by examining the mean experience overall. Thus, a downward bias exist for firms with broad variations in foreign investment experience. To provide more accurate depictions of each firms experience at the extremities, the measure, *host minimum*, is created.

For robustness, a *depth* measure is formulated to capture the number of years of investment experience in each type of regulatory environment. Depth is calculated from the year of inception of the first foreign investment in that country until 1998, the investment period before entering Brazil.

In addition, a *breadth* variable is created to capture the range of types of experience. Firms that have more variation in the types of host country regulatory environments also likely benefit by having the greatest degree of combinative experience in the aforementioned dimensions of regulation. The *breadth* of experience is captured by the variance, *V*, of the regulatory dimension scores across all firm investments, such that $V = \sum \left(X_{ij} - u \right)^2 / N$.

It is important to mention alternate explanations may contend that firms have different learning rates based on how they learn from these in-country experiences. While this is likely, the scope of this paper does not address these arguments. Such learning rate variations among firms should be addressed in future research.

3. Empirical Evidence

3.1 Empirical Setting

This study is specifically designed to measure a firm's propensity to exit Brazil given the firm's cumulative set of previous host country investments acquired in heterogeneous regulatory institutional environments. The selected empirical setting examines the entire population of foreign investment into the Brazilian telecommunications industry post market privatization and liberalization. This study observes firm entry into and exits from the Brazilian market during the period of 1997-2004. Brazil represents a sensible natural experiment for empirical investigation for several reasons. First, there is a broad range of foreign investment entries into Brazil representing firms from developed countries, emerging markets and underdeveloped countries. In the mid-1990s, Brazil underwent major economic growth as a result of the Real Plan (Plano Real), which attracted foreign investment from around the world to many of its recently privatized industries including telecommunications, electricity and gas. In the tele-

communications industry alone, market privatization attracted firms from 18 different nations with prior foreign experiences in 80 countries. Second, this study examines investment into the telecommunications industry, one of the most highly regulated industries. Given that Brazil underwent market privatization, the telecommunications regulatory agency and statutory laws were instituted at the inception of our study. Thus, this era provides a unique lens for examining how the regulatory conditions affect firms' investments over time. Third, market entry patterns into the telecommunications industry provide a clean methodological experimental design for event history modeling. The majority of firm entry (more than 80%) occurred within the first two years after market privatization, therefore, hazard model specifications used for empirical analysis are not burdened with left side censoring concerns. Lastly, telecommunications regulation in Brazil is closely representative of the mean level of telecommunications regulation among the 80 countries examined in this study. Given this, comparisons between types of experience are more equally distributed.

3.2 Data Collection and Description

There are 110 domestic and foreign firms providing telecommunications services in Brazil (including Standard Industrial Classification (SIC) codes 4812 - wireless, 4813 - fixed and 4822 - messaging and 4899 – misc. and satellite). A customized dataset of the entire population of foreign firm entries and exits into the Brazilian telecommunications industry was constructed first hand by collecting and triangulating data gathered from several data sources including the Conselho Administrativo de Defensa Economica (CADE), BNDES (The Development Bank of Brazil), ANATEL (the Brazilian telecommunications regulatory agency), and the Comissão de Valores Mobiliários (CVM – equivalency to the U.S. SEC). Data construction was also augmented by recounts of market events provided by 30 telecommunications and regulatory

agency executives. Subsequently, secondary sources including the ISI Emerging Markets database and other public press sources were used to validate each clinical case of the firm's entire event history. Ninety-five out of the 110 telecommunications firms are foreign-held subsidiaries owned by 66 foreign telecommunications parent firms from 18 different countries. The majority of these firms are publicly traded on at least one global stock exchange. This data generates 1,193 parent/year observations. More than 400 observations were dropped, including 348 observations that represent the domestic ownership in these subsidiaries, 60 observations with non-telecommunication participation (i.e., investment banks) and 5 observations of exits that were not failures (Headd, 2003) [13]. The result is a total of 782 parent/year observations left for empirical examination. The majority of foreign investment parent/year observations are from the United States (29%), Spain (13%), Italy (15%), Portugal (12%) and Canada (10%) (see Table 2 for all countries).

3.3 Methodological Approach

To empirically test the hypotheses, there are two key modeling requirements that need consideration in the empirical specification. First, the model should measure the likelihood that a firm succeeds or fails conditioned on their prior institutional experiences ex ante entry into Brazil. Secondly, it should measure how the changes in the covariates across time, *t*, affect survival rates. The model specified is a dynamic analysis hazard rate model (Carroll, 1983) to predict the likelihood of two states: firm success (0) or firm exit (1) given their prior experience in heterogeneous host country regulatory environments. This hazard rate model utilizes

[13] Firm exits were precisely coded to capture other reasons for market exit that are not resultant in failures. Alternate explanations for a firm exiting the event history included (2). a renaming of the parent or subsidiary (3) mergers/acquisitions,and (4) geographic regulatory constraints on the number of firms allowed ownership in a given region. Three of the five observations dropped for reasons of mergers and renaming were reconnected to their surviving related firms by adding in their time durations prior to the event. The other two dropped observations due

information about the duration of time lapsed, *T*, from the firm's date of entry into Brazil until the firm's exit at a given point in time *t* for every firm observation *i*. The *hazard rate* provides probabilities of failure in the next period, $t + \Delta t$ (scaled to years in this study) given the firm succeeded until time *t*, expressed as:

$$\lambda(t) = \lim_{\Delta t \to 0} \frac{\Pr ob(t \le T \le t + \Delta t \mid T \ge t)}{\Delta t}$$

Empiricists have demonstrated that the hazard functions that most accurately depict the lifecycles of organizations are non-monotonic functions (Hannan and Freeman, 1989; Carroll and Huo, 1986). Therefore, a log-logistic[14] accelerated failure time (AFT) model is specified for the reasons of its inverted-U shaped properties and the ability to forecast failure beyond the life of the study.

Another concern that requires attention in utilizing hazard rate models is both left-hand and right-hand censoring. Since the Brazilian telecommunications market was effectively deregulated beginning in July 1997, left hand censoring issues are primarily alleviated since almost no firms were in existence yet. Prior to this period, the telecommunications industry was state-owned and operated by *Telebras*. However, right-hand censoring could be problematic in interpreting the outcome of what will happen to firms that are between states of success and failure. To correct for such concerns, I use a model to fit Type 1 censored observations (Lawless, 1982).

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to regulatory constraints did not receive this treatment as the firms reason for the strategic changes are not transparent.

[14] The log-logistic model is such that the hazard rate is: $h(t) = \frac{\lambda\rho(\lambda t)^{\rho-1}}{1+(\lambda t)^{\rho}}$. The log-logistic regression model is $\log \boldsymbol{T} = -\boldsymbol{\beta}^{'}\boldsymbol{x} + \sigma \boldsymbol{W}$.

Expectedly, the construction of the null hypothesis would infer no statistical difference between firms with prior similar regulatory experience versus dissimilar regulatory experiences. The hypotheses presented predict a rejection of this claim.

A key limitation to this methodological approach is that it does not account for the endogeneity of the firm's choice to enter Brazil. The axiomatic assumption of this model is that firm entry is based on random selection. However, in previous work on firm entry-mode selection, Shaver (1998) illustrated the point that a firm's strategic choices are not indicative of a random treatment model. In the case of this study, I observe the performance of the firms that decided to enter the Brazilian telecommunications industry. The methodological approach suggested above does not account for the self selection bias that may exist in unobservable firm characteristics (such as possession of Portuguese language experts, international operating procedures, or international marketing skills) based on the entry choice captured in the error term, ε, and could potentially result in a statistically unstable result. The core problem is the confounding of the unobservable variable that could result from either the entry choice or the firm's ability to perform in Brazil.

To correct for specification errors, the subsequent version of this paper will conduct such correction techniques. Selection bias correction techniques specified for linear regression (Heckman, 1979) and discrete choice models have been well documented and applied across many disciplines. However, little attention has been given to the selectivity issues in duration models. Boehmke, Morey and Shannon (2006) propose a solution, using a Monte Carlo methodology, to improve the accuracy of the statistical inferences in duration models.

Given this paper is not yet able to achieve such corrections, individual clinical studies are conducted on each subsidiary investment in Brazil to better understand and define the observable

variables in the parameter matrix, X_i. This minimizes the effects of the unobservable characteristics of the firm that would result in such biases discussed above.

3.4 Variables

3.4.1. Dependent Variable:

The central dependent variable is firm survival (0) or failure (1) given the firm's entry into Brazil. Defining failure can be problematic in event history studies because many market exits are not the result of firm failures. In the case of this study, failure is defined as a market exit driven by a firms' divestment in one or more of their subsidiaries in Brazil. Given that firms can exit a market for a host of reasons (Headd, 2003), the following approach is carefully utilized to classify market exits and thus failures. First, clinical analysis of each firm is conducted (using search results from ISI Emerging Markets, Factiva and Lexis Nexis) to understand their reason for market exit. Then, six different transition codes are developed to capture the reasons for market exits including (1) divestitures, (2) mergers and acquisitions, (3) subsidiary or (4) parent renaming, and (5) swaps or asset sell offs due to regulatory constraints. All exits resultant from reasons 2 to 5 are not classified as failures. Recent literature also makes clear that firms sometimes strategically have planned exits for reasons of organizational learning effects (Nakamura *et al.*, 1996) or capital gains opportunities from viable businesses (Headd, 2003). To rule out these possibilities, the financial results of each firm are examined to ensure that the firm's divestment resulted from financial underperformance in earnings projections, difficulty securing capital to continue the investment, lack of understanding of local institutions or related situations.

3.4.2 Independent variables:

<u>Prior experience</u>

The primary explanatory variable is the regulatory distance measure, which captures each firm's prior experience in regulatory institutional environments versus that of Brazil. The calculation of this measure was previously discussed in section 2.2.

To reexamine the conventional hypotheses that frequency of FDI leads to subsequent performance improvements, I construct two additional variables. *Conventional FDI experience* captures the frequency of investments into Brazil. This measure replicates the methodology used in the existing literature on foreign investment. *Number of countries FDI* measures the number of foreign countries each firm has invested in prior to entering Brazil. The intent here is to examine the effects of incremental investment experience in different countries versus having no prior FDI experience where countries *j* range from 0, …, *n*.

The subsequent version of this paper will also examine other performance measures mechanisms discussed in section 2.3 including 1) *accuracy of cash flow predictions*, 2) *better project selection* and 3) *exposure to market volatility*. The recommended variable specification for each of these measures can be found in Appendix 7.

3.4.3 Control variables

Firm Specific

Several firm specific control variables are used to capture the impact of the hazard from other endogenous characteristics (Table 3). Controls include: firm size (measured by sales revenues), technology provided, geographic region of licensure, and incumbent status. Also, a dummy variable, *auction FDI restrict*, is created to code firms that participated in the first privatization licensing auction in Brazil in July 1998. Out of the nine privatization auctions, this one was the only that imposed foreign investment ownership restrictions on entrants.

Institutional Controls

I include several comparative measures of the institutional environment that previously substantiated explanation for firm level heterogeneity in strategic choice. The Hofstede (1980) cultural dimensions (*power distance - PDI, collectivism versus individualism - IDV, femininity versus masculinity - MAS, and uncertainty avoidance - UAI*) are used for controls by replicating the *cultural distance*[15] methodology by Kogut and Singh (1988, pg 422). For the exact formulation, see footnote[16] below. Their study opertationalized the distance measure referencing investment into the U.S. The approach is updated with Brazil as the reference country of measurement. I also utilize the *POLCON* measure constructed by Henisz (2002) which captures institutional political hazards for each home country and compare to Brazil by utilizing a Euclidian distance formulation[17]. The La Porta *et al* (1998) *legal origins* measure is included as a control to capture institutional variations from the underlying legal structures of each country. Given that Brazil's legal origins are based on the French civil law system, I recode the LaPorta *et al* measure from weakest (1 = *civil law*) to strongest (4= *common law*) legal systems to make Brazil to comparable reference[18]. Lastly, the *law and order* (Kaufmann, Kraay & Zoido-Lobatón, 1999) measure is also used to capture the institutional heterogeneity in the efficiency of

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[15] Hofstede does not measure the cultural dimensions in the country of Luxembourg. Therefore, I use the cultural measures for Belgium as a proxy for the culture in Luxembourg given the proximity, historical ties and cultural diffusion in this region.).

[16] Kogut and Singh (1988) define cultural distant by using the computation "$\boldsymbol{CD_j = \sum_{i=1}^{4} \{(I_{ij} - I_{iu})^2 / V_i\} / 4}$, where I_{ij} stands for the index for the *i*th cultural dimension and the *j*th country, V_i is the variance of the index of the *i*th dimension, *u* indicates the United States, and CD_j is the cultural difference of the *j*th country from the United States" (Kogut and Singh, 1988; pg 422).

[17] The Euclidian distance, $\boldsymbol{D_E = (p_x - q_x)^2 = |p_x - q_x|}$, is used to calculate a distance for each country in comparison to Brazil for the *POLCON*, *legal origins* and *law and order* variables. The simplest form of the Euclidean distance is used given that each of these measures is one dimensional.

[18] The La Porta *et al* (1998) study does not measure legal origins in two of the home countries included in this study, Panama and Luxembourg. Both of these countries have legal origins based on the civil law system and have been coded accordingly.

governments. For each of these institutional controls, a distance measure is also computed from each firm's home country and Brazil.

Industry Controls

Industry level controls include SIC codes for the telecommunications sectors 4812 – fixed (1), 4813 – wireless (2), 4822 – messaging service and 4899 – satellite services (4). Industry controls also include concentration and industry growth rates. These measures are conventionally used for industry effects related to the competitive pressures of the market.

Descriptive statistics on all of these variables are in Table 5.

Robustness

For robustness, I also test alternate measures for culture as the Hofstede measures have been criticized for limiting the dimensions of culture and lack of generalizability. Given the study was conducted in a single multinational corporation, firm effects and country effects are largely inseparable. Therefore, the Schwartz (1994) *cultural dimensions of values* and a *language* variables (Grimes, 1992) are also used. The *cultural dimensions of values* capture the composite scores of the 7 dimensions[19] of culture defined by Schwartz (1994) and measure the Euclidean distance between Brazil and that of the home country, *j*. The *language* variable is constructed by using the Grimes (1992) language family trees to measure a countries level of closeness in family relationship to the official language in Brazil, Portuguese. For example, 1 represents other sibling related countries where Portuguese is also the official language (e.g., Portugal). Two represents other Ibero-Romance languages (e.g., Spanish and French). Three represents Gallo Romance languages (e.g., Italian). Four represents other Indo-European languages (e.g., English, German, etc.) and so on.

[19] The seven cultural dimensions defined by Schwartz (1994) are conservatism, affective autonomy, intellectual autonomy, hierarchy, mastery, egalitarian commitment and harmony.

I also include a variable to capture the directional sign of the *firm Mahalanobis distance* (FMD). One known limitation and criticism of this measure is the computation, which calculates the squared distance, only provides positive measure of similarity. This can be misleading as similarity can come from regulatory environments that are both more stable (i.e., scores higher than Brazil) or less stable (i.e., scores less than Brazil). For example, Germany and Romania appear to have similar *FMD* in comparison to Brazil at 20.9 and 16.5 respectively. However, the actual regulatory environment in Germany is far more stable (i.e., regulatory scores of 28.0) than in Romania (regulatory scores of -9.26). The variable noted *plus_minus* captures the upward or downward directional effects.

Lastly, a *U.S. dummy* variable is created to account for any undisclosed liabilities of foreignness that may be only applicable to this set of firms. The plausibility of such unobserved country effects are real given that 50% of the failures in this study are from US firms.

4. Results

Table 7 summaries the hazard rate model results. Model 1 first examines the statistical significant and relevance of all included institutional, firm specific and industry control variables. Results confirm expectedly positive and significant firm size effects ($p \leq 0.10$ level) and SIC code sub-industry effects ($p \leq 0.05$ level). Thus, larger firms and competitors in more technologically advanced sectors of telecom (i.e. wireless and satellite versus fixed line services) have elongated survival durations. However, inconsistencies in the initial results are found among the institutional control variables. The *legal origins* and *law and order* variables results are negative and significant as expected. Unexpected signs occur on the *POLCON* and *culture distance* measures with insignificance on the culture distance measure also. Further

investigation is needed given that the existing literature predicts all four institutional variables should have negative effects the greater the distance.

Descriptive statistics reveal a multicollinearity problem with the *legal origins* variable and a few other institutional variables - *culture distance* at the .80 level, *FMD – 50/50* at the .74 level and the *FMD – home country* at the .78 level. (See Table 6 for correlation.) This explains the above mentioned instability in the coefficients of the institutional variables. To improve matrix stability and reliability of the partial results, the *legal origins* variable is removed from Model 1. As a result, the institutional controls achieve stability with negative coefficients and statistical significance ($p \leq 0.01$). This redundancy problem is treated in subsequent models by consistently eliminating the *legal origins* variable.

Model 2 measures the effects of prior FDI experience as operationalized in the extant literature (i.e., repeated investments in a single host country). Results reveal positive and significance of the *conventional FDI experience* variable ($p \leq 0.01$ level). This provides confirmatory evidence that firms which increasingly reinvest in the same host country have significantly higher survival rates than firms with fewer investments. However, the frequency of global FDI experience across countries has no significant benefits. The *number of countries FDI* measure reveals a positive but insignificant relationship with firm survival duration. Previously discussed controls remain stable with the exception of *POLCON* and *culture distance*, which lose statistical significance.

Models 3-5 add in the effects of the primary explanatory variables regulatory experience. The overarching hypothesis suggests that firms with similar regulatory experience, *firm regulatory distance (FMD),* are more likely to survive, while firms with dissimilar experience are more likely to fail. Model 3 examines the effects of the home country regulatory

environment alone. Results reveal both negative and significant effects of the *FMD – home country* variable ($p \leq 0.01$ level). Model 4 examines the effects of all previous host country investments each weighted equally. The variable *FMD – host country is* positive but insignificant. This result directionally suggests that having a broader range of experience outside the home country has positive implications for performance. Model 5 examines firm's home and host country experience equally weighted where $w_h = .50$ and $w_j = .50$. Results reveal negative and statistical significance of the *FMD – 50_50* variable which supports the main hypothesis.

Results in models 6 demonstrate that having a breadth of FDI experiences in a broad variety of regulatory conditions has positive but insignificant affects on firm performance. Model 7 demonstrates that firms with *host minimum* country experience more similar to Brazil than their home country significantly benefit from enhanced performance ($p \leq 0.01$ level). Results in model 8, with more instable control variables, demonstrate that a *depth* of experience in a specific country has positive but insignificant effects on performance. Such results should be more conclusively examined in future studies as model 8 was reduced from 782 to 283 observations given limited data availability at the conclusion of this study. The organizational learning literature also reveals that organizations do forget and the consequences are likely to negatively effect firm performance (Argote, Beckman & Epple, 1990; Argote, 1999; see Martin de Holan & Phillips, 2003 for a review). To understand the learning decay implications of the above presented depth measure, a learning decay measurement should also be developed for subsequent studies to capture the depreciation of knowledge transferred over time. The proposed decay rate, λ, should be tested at key increments (for example, 100% decay at both 5 and 10 years prior to the investment in Brazil). If learning depreciation effects prevail, the positive association of having a depth of experiences in model 8 may become instable over time.

Robustness checks tested in models 9-11 are reported in Table 8. Results hold constant if *language* is substitutes in the previous model 5 in lieu of the *culture distance* measure in model 9. The Schwartz (1994) cultural distance measures also maintain significant results in model 10. Model 11 results test the directional effects of firm success from institutional environments that are more stable versus less stable than Brazil. Results indicate that firms coming from a home country where the regulatory environment is less stable than Brazil are significantly ($p \leq 0.01$ level) more likely to survive than firms from a more stable regulatory conditions. This suggests that it is more difficult for firms to adapt to conditions that have less structure and formality in rule of law.

Further analysis shows that firms from host countries with similar regulatory conditions rarely experience market exit. For example, firms from Spain, Portugal, Mexico and Argentina did not experienced failure. Accordingly, their regulatory distances are 3.52, 1.96, 5.66 and 3.43 respectively. Alternatively, firms from the U.S., Canada, and Japan, more stable regulatory environments, frequently experience failure (see Table 4). Their regulatory distances versus Brazil represent larger gaps in the institutional environment at 26.03, 10.19 and 34.84 respectively. This data posses two further important questions. What are the magnitude differences in failure rates in comparing firms with similar versus dissimilar experience? Further, do firms with similar regulatory home country experience, but no prior FDI experience out perform firms with prior FDI experience, but dissimilar regulatory experience? To answer both of these questions, the data is recoded to differentiate firms within no prior FDI experience (1) from firms with prior FDI experience (0). The data is further categorized by levels of similarity based on the deviation from the mean[20].

[20] The data is coded (1) if the *FMD-50/50* is above the mean and (0) if the *FMD-50/50* is below the means.

The overall hazard rate of firms in the telecommunications industry is approximately 0.04 by the ending of this study. Results of the hazard rate analysis show dramatically differing magnitude effects of similar versus dissimilar experience. Firms with dissimilar experience are *six times* more likely to fail (0.12 hazard rate) than firms with similar experience (0.2 hazard rate; see Figure 2).

Table 9 provides insight into this second question. I further code the data into four categories based on prior FDI experience (1=no, 0=yes) and regulatory similarity (1=similar; 0=dissimilar). Results indicate that the firms most likely to succeed have similar regulatory experience, regardless of their prior FDI experience. The best performers are firms with no FDI experience, but similar home country regulatory experience at .004 hazard rate followed by firms with prior FDI experience and similar regulatory experience at .007 hazard rate. Interestingly, firms with prior FDI experience but dissimilar regulatory experience are only marginally more likely to succeed (.024 hazard rate) than firms with no prior FDI experience and dissimilar regulatory experience (.03 hazard rate). This confirms the previous finding that home country effects are the more powerful predictor of success

5. Conclusions and Implications

This paper addresses a fundamental and necessary question of FDI theory, "Does prior experience really pay?" in an effort to re-examine our understanding of experience. Conventional theories on foreign investment assert that firms with prior FDI experience benefit from subsequent performance improvements. However, this paper demonstrates that frequently experience leads to failure, particularly when the firm's experiences are unrelated to the target investment country's regulatory institutional environment. This paper deviates from the core

assumption that experience is measured as a frequency of foreign investments of multinationals. Experience, in this study, is measured by classifying the types of firms' institutional experiences based on six key regulatory dimensions (Perkins, 2006). The gap in firm's institutional experiences and that of the reference investment country, Brazil, is captured by using a Mahalanobis distance measurement technique. While this paper reveals that having similar institutional experience partly explains the variation in performance, the broader interpretation infers that firms can benefit strategically by learning from contextual business environments (i.e., non-market factors). Regulation is the key focal institutional structure of this study. However, this perspective applies more broadly to other national institutions such as government legal structures (La Porta *et al*, 1997), political climate (Henisz, 2000), intellectual property rights (Zhao, forthcoming), economic crises (i.e., currency devaluations), *etc*. The key managerial challenge is identifying the institutional dimensions that differ from the firm's capabilities ex ante investment entry. Informed managers can more accurately assess and strategically optimize the FDI sequential patterns of investment that leverage the firm's institutional capabilities. The advantage of the informed investment manager also enables experienced firms to select investments that appear to be risky to the inexperienced firm by uniquely deploying the experienced firm's institutional knowledge from diverse environments (Davidson, 1980). These investment benefits may appear intuitive; however, interviews with 28 telecommunications executives (conducted for this study) revealed that many foreign investment managers do not make such underlying connections. Oftentimes, managers were blindsided by such institutional variations. This leads us to the next contribution of this research.

This study also revealed that experience can negatively impact firm performance, particularly when the previously acquired experience mismatches with the key dimensions of the

target country institutions. By using this inappropriate knowledge from dissimilar experiences to determine investment decisions, firms increase the risk of failure by grossly overestimating performance outcomes and expectations. Such managerial overconfidence often results in a pattern of underperformance. This leaves investment managers more risk-adverse to subsequent foreign investments by assuming the lack of success is the consequence of exogenous market factors when, in fact, lacking performance is highly influenced by managers' inefficient decision-making (Clapham & Schwenk, 1991). The inability of managers to adapt to some institutional environments indicates that perhaps some firms suffer from learning competence traps (Levitt & March, 1988; Levinthal and March, 1993) developed from selected and inherited investment knowledge. Hence, managers become trapped in myopic thinking that prohibits adaptation to dissimilar institutional dimensions. Case in point, a telecommunications executive provided this view of their colleagues' decision-making myopia:

"These guys think they have seen everything. They find a solution that worked in the U.S. and try to use it in Brazil. The problem is: this is not Indiana!"

The comparative regulatory measures utilized in this paper are exemplars from the global telecommunications industry. The impact of this study has broader generalizability across other highly regulated industries such as environmental regulations on energy; patent protection and drug content regulations on pharmaceuticals; state and local regulations on health care; or similar application in the airlines, high tech and banking industries. This research unveils unexplained heterogeneity in foreign investments that is largely overlooked by strategy scholars.

Because the experimental design is limited to examining firms' investment performance in a single country and a single industry, admittedly, the generalizability of the results needs further testing in more expansive scope of variation. This study design is also limited in its

ability to measure whether organizations have learned from these experiences over time. Firm learning could be more precisely measured by examining firms' performance in each of these prior investment countries over the entire history of the internationalization process. Thus, a more complete analysis of the sequential investment patterns of successes and failures of these firms begins to meaningfully explain the heterogeneity in learning rates of firms. Given that existing organizational learning arguments do not sufficiently explain such variation among firms' learning curves, future research extensions of this work could provide more insight to experiential learning effects. However, to give just credit to this research, this study informs organizational learning theories that the environmental context of the learning matters; frequently, unobserved heterogeneity embedded in the context potentially explains learning inefficiencies and a potential rationale for why such learning rates differ. The methodological framework used to measure the gaps in knowledge acquisition provides a useful methodology for application in future organizational learning studies.

Foreseeable future research extensions call for further investigation of the variations in firm learning rates, further identification of the characteristics of efficient sequential foreign investment patterns and development of a model that depicts the relationship between unique FDI institutional experience and sustainable competitive advantage. This research is also well positioned to make significant contributions to the literature on organizational learning. The detailed data collection efforts on foreign investment of multinationals' investments and performance globally provides a unique lens to explore and compare different organizational learning theories within a single study. The conventional wisdom in organizational learning suggest that leaning occurs through repetition in routines (i.e., learning curve). More contemporary organizational learning theories demonstrate specific types of in-depth knowledge

(i.e., merger and acquisition experience) also has significant performance benefits. More nuanced learning models demonstrate that knowledge decays over time as organization forget.

While all of these arguments have been independently explored, there is an inconsistent view on how these aspects of organizational learning are related. This research is well positioned to demonstrate the relationship of several learning theories in a single study research design. A future direction of this project will compare these organizational learning perspectives and map their interrelatedness.

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Table 1**: FDI Experience versus Similar Institutional Experience and Firm Failure**

Parent	FDI experience[1]	Similar Experience[2]	Failed
Aether Systems	0	0	0
America Movil	0	1	0
Amper	0	1	0
Telespazio	0	1	0
Comsat	0	0	0
Diveo	0	0	0
Iberdrola	0	1	0
Global Village Telecom	0	1	0
IMPSAT Fiber Networks	0	1	0
Intelligent Mobile Solutions	0	1	0
Universal Telecom Services SA	0	1	0
Magnum Group	0	1	0
National Grid	0	1	0
Nextel Communications, Inc.	0	0	0
Portugal Telecom	0	1	0
SGC	0	1	0
Spring Wireless	0	0	0
Telecom Italia	0	1	0
Telefonica	0	1	0
TeleNova Corporation	0	0	0
Wireless New Technology	0	0	0
Acom Comunicacoes	0	1	0
360 Degrees Americas	0	0	1
Advent Paam Global	0	0	1
ComTech Telecommunications	0	0	1
Globalstar	0	0	1
Itochu	0	0	1
ITXC Corporation	0	0	1
LCC International	0	0	1
Nippon Telegraph & Telephone Corp	0	0	1
Primedia	0	1	1
SK Telecom Co	0	1	1
Starmedia	0	0	1
Telesystem International Wireless Inc.	0	0	1
Velocom	0	0	1
Williams Communications	0	0	1
Flag Telecom	1	1	0

France Telecom	1	1	0
Loral Space & Communications	1	0	0
Mastec	1	0	0
Nortel Networks	1	0	0
PanAmSat Corporation	1	0	0
Sprint Corporation	1	0	1
Bell Canada	1	0	1
AES Corporation	1	0	1
AT&T	1	0	1
Bell South	1	0	1
Deutsche Telekom	1	0	1
Gilat Satellite Networks Ltd	1	1	1
KDDI CORP	1	0	1
MCI/Worldcom	1	0	1
Motorola	1	0	1
Primus Telecommunications Group	1	0	1
Qualcomm	1	0	1
RSL Communications	1	0	1
SBC	1	0	1
SES Global	1	1	1
Telia	1	0	1
Total Failures			**30**
- *Experienced*	53%	13%	
- *Non Experienced*	47%	87%	
Total Success			**28**
- *Experienced*	21%	61%	
- *Non Experienced*	79%	39%	

[1] Experience with FDI outside home country <5 prior to the investment in Brazil

[2] Similar experience in home or host country

Figure 1: **Mahalanobis Distance of Regulation**

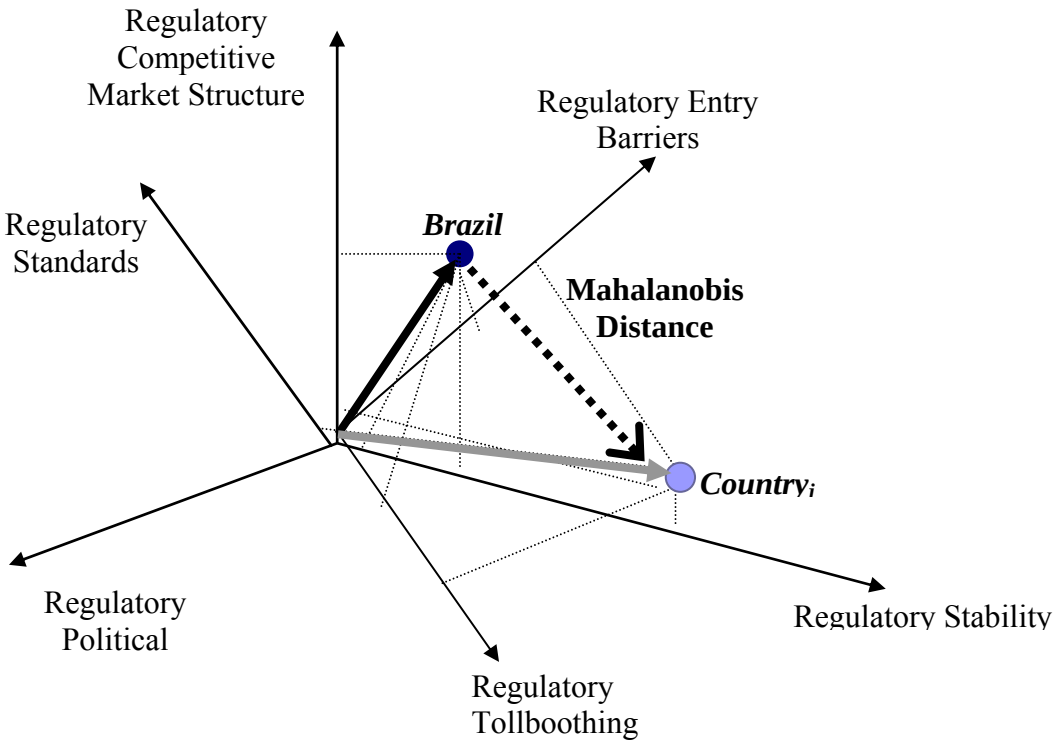

Table 2**: Descriptive Statistics: Parent Company Home Country**

Home Country	***Freq.***	***Percent***	***Cum.***
Argentina	21	2.69	2.69
Canada	76	9.72	12.4
Denmark	5	0.64	13.04
France	19	2.43	15.47
Germany	4	0.51	15.98
India	9	1.15	17.14
Israel	16	2.05	19.18
Italy	114	14.58	33.76
Japan	32	4.09	37.85
Korea	4	0.51	38.36
Luxembourg	6	0.77	39.13
Mexico	34	4.35	43.48
Panama	1	0.13	43.61
Portugal	96	12.28	55.88
Spain	104	13.3	69.18
Sweden	5	0.64	69.82
UK	12	1.53	71.36
US	224	28.64	100
Total Parent/Year Observations	782	100	

Table 3: **Control Variables**

Variables	***Description***	***Data Sources***
Prior Experience		
Number of Countries FDI	Sum of prior host countries of FDI	• D & B Million Dollar Database
Institutional Effects		
POLCON	Political hazards in home country of origin	• Henisz (2002)
Legal Origin	Legal origins of home country	• LLSV (1998)
Cultural Distance	Cultural dimensions; MAS, PDI, UAI, IDV	• Hofstede (1980)
Law & Order	Quality of government measure	• KKZ (1999)
Firm Effects		
Size	Sales Revenues	• Comissao Valores Mobiliarios
Technology	Technology (i.e., fixed, wireless, etc.)	• ANATEL
Incumbent	Acquisition of an incumbent firm	• ANATEL
Company Region	Geographic regions of service	• ANATEL
Industry Effects		
SIC CODE	Sub-sectors within telecom	• D & B Million Dollar Database
Auction_FDI_Restrict	Auction with FDI ownership restricted	• ANATEL

Table 4: **Descriptive Statistics: Home Country Success/Failure**

Home Country	***Success***	***Failure***	***Total***	***Regulatory Distance***
Argentina	21	0	21	4.86
Canada	60	16	76	10.80
Denmark	5	0	5	10.24
France	19	0	19	5.23
Germany	3	1	4	20.90
India	9	0	9	5.77
Israel	15	1	16	5.95
Italy	113	1	114	4.97
Japan	25	7	32	34.84
Korea	3	1	4	12.78
Luxembourg	5	1	6	3.34
Mexico	34	0	34	5.66
Panama	1	0	1	9.24
Portugal	96	0	96	1.96
Spain	104	0	104	3.52
Sweden	4	1	5	8.69
UK	12	0	12	7.25
US	195	29	224	26.03
Total	**724**	**58**	**782**	

Table 5: **Descriptive Statistics: Summary Data**

Variable	***Obs***	***Mean***	***Std. Dev.***	***Min***	***Max***
POLCON_2002	782	0.116964	0.0659	0.019279	0.325773
Culture Distance	782	1.964202	1.263836	0.384713	6.857662
Legal Origin	782	1.407928	1.454769	0	3
Law & Order	782	3.372123	0.895795	1	4
Size_Revenues	782	1064247	2008717	1000	10400000
Technology	782	5.7711	2.902166	1	13
Incumbent	782	0.294118	0.455937	0	1
Company Region	782	6.778772	4.704961	1	14
SIC_code	782	4818.711	21.91377	4812	4899
Auction FDI Restricted	782	0.191816	0.393981	0	1
Number of Countries FDI	782	5.140665	4.74315	0	24
Conventional FDI Experience	782	7.505115	6.847851	1	22
FMD - Host Country	782	7.707668	4.445958	0	20.89716
FMD - Home Country	782	12.55844	10.62921	1.96	34.84
FMD_50_50	782	11.8095	7.668423	1.96	34.84
US_Dummy	782	.286445	.4523892	0	1

Table 6**: Correlation Table: Institutional Experience and FDI Performance**

Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**
POLCON_2002	1														
Culture Distance	0.335	1.000													
Legal Origin	0.455	0.803	1.000												
Law & Order	0.032	0.695	0.563	1.000											
Size_Revenues	-0.171	-0.231	-0.246	-0.183	1.000										
Technology	-0.152	-0.059	-0.052	-0.013	0.126	1.000									
Incumbent	-0.351	-0.348	-0.347	-0.224	0.383	0.258	1.000								
Company Region	0.193	0.121	0.256	0.189	-0.077	-0.221	-0.429	1.000							
SIC_code	0.012	0.153	0.139	0.157	-0.094	0.009	-0.179	0.251	1.000						
Auction FDI	0.335	-	-	-	-	-	-	-	-	1.000					
Restricted		0.020	0.003	0.159	0.091	0.209	0.315	0.159	0.145						
Number of Countries FDI	-0.145	-0.137	-0.027	-0.015	-0.003	-0.054	-0.099	-0.104	-0.002	-0.017	1.000				
Conventional FDI Experience	-0.310	-0.565	-0.692	-0.280	-0.246	-0.113	-0.394	-0.278	-0.154	-0.026	-0.050	1.000			
FMD - Host Country	-0.090	-0.015	-0.038	-0.214	-0.064	-0.074	-0.036	-0.052	-0.025	-0.013	-0.512	-0.086	1.000		
FMD - Home Country	-0.398	-0.675	-0.780	-0.550	-0.208	-0.027	-0.215	-0.220	-0.139	-0.016	-0.023	-0.624	-0.005	1.000	
FMD_50_50	-0.310	-0.644	-0.738	-0.567	-0.191	-0.016	-0.141	-0.197	-0.130	-0.059	-0.104	-0.575	-0.093	-0.945	1

Table 7: **Hazard Rate Regression Results**

Variable	**Model (1)**	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**
POLCON_2002	0.007395***	-0.0021933	-0.0060673***	-0.005313***	-0.0054436***
	(.002904)	(.001615)	(.0011836)	(.00187)	(.001691)
Culture Distance	0.000177	-0.0000229	-0.0002415***	-0.0003294***	-0.0002378***
	(.000167)	(.000079)	(.000080)	(.000075)	(.000077)
Legal Origin	-0.000710***				
	(.000146)				
Law & Order	-0.000954***	-0.0008676***	-0.0006909***	-0.000843***	-0.000641***
	(.00026)	(.000207)	(.000164)	(.000206)	(.000160)
Size_Revenues	1.23E-10*	1.11E-10*	5.86E-11	1.10E-10	5.08E-11
	(.000000)	(.000000)	(.000000)	(.000000)	(.000000)
Technology	0.000012	0.0000126	2.84E-05	-8.45E-06	0.0000177
	(.000023)	(.0000229)	(.000022)	(.000024)	(.000021)
Incumbent	-0.000528***	-0.0007295***	-0.0001585	-0.0005402***	-0.0000952
	(.000192)	(.000202)	(.000195)	(.000204)	(.000190)
Company Region	0.000007	0.0000102	2.05E-06	-4.31E-06	-8.63E-07
	(.000015)	(.000015)	(.000014)	(.000016)	(.000014)
SIC_code	0.000009**	7.34E-06**	1.14E-05***	6.96E-06*	9.02E-06***
	(.000004)	(.000003)	(.000004)	(.000004)	(.000004)
Auction FDI Restricted	-0.000836***	-0.0011092***	-0.0006562***	-0.0008755***	-0.0007862***
	(.000160)	(.000165)	(.000149)	(.000169)	(.000143)
US_Dummy	0.0003569**	0.0005176***	0.0013457***	0.0004393***	0.0010991***
	(.000158)		(.000196)	(.000163)	(.000171)
Number of Countries FDI		0.0000139			
		(.000015)			
Conventional FDI Experience		0.0000934***			
		(.0000183)			
FMD - Home Country			-0.0000614***		
			(.000009)		
FMD - Host Country				1.56E-06	

				(.000015)	
FMD_50_50					-0.000071***
					(.000010)
Cons	7.56195***	7.570631***	7.552674***	7.574395***	7.563963***
	(.018232)	(.016367)	(.020214)	(.018160)	(.016952)
Number of obs	782	782	782	782	782
Log likelihood	281.98641	284.99999	289.07689	266.92552	288.37553

*p≤0.10; **p≤0.05; ***p≤0.01
Values in parentheses are standard errors

Table 7 *continued*: **Hazard Rate Regression Results**

Variable	Model (6)		Model (7)		Model (8)	
POLCON_2002	-0.0075012	***	-0.0098495	***	0.0112679	***
	(.002249)		(.002581)		(.0037032)	
Culture Distance	-0.0004892	***	-0.0005682	***	0.0151234	***
	(.00012)		(.0001211)		(.003388)	
Legal Origin						
Law & Order	-0.0008761	***	-0.0011552	*	-0.0348164	
	(.000281)		(.0004353)		(.3086488)	
Size_Revenues	1.13E-10		8.83E-11		3.79E-11	
	(.000000)		(7.87e-11)		(.0000000002)	
Technology	-5.03E-06		0.0000229		-0.0000538	**
	(.000028)		(.0000273)		(.0000249)	
Incumbent	-0.000393		0.0000776		0.0002643	
	(.000278)		(.0003133)		(.0015426)	
Company Region	5.13E-06		4.99E-06		0.0000628	**
	(.000019)		(.000017)		(.0000202)	
SIC_code	0.0001377		5.00E-05		0.0001341	
	(.000109)		(.0000988)		(.0000957)	
Auction FDI Restricted	-0.0006509	***	-0.0006139	**	-0.0004117	
	(.000229)		(.0002123)		(.0002836)	
US_Dummy	0.0007398	***	.0006344	***	-0.0088335	***
	(.000204)		(.0001649)		(.0021132)	
Breadth	-1.36E-06					
	(.000002)					
Host Minimum			-.0002388	***		
			(.0000461)			
Depth					4.58E-06	
					(.000028)	
Cons	7.60836	***	7.61112	***	7.701213	***
	(.001271)		(.0019382)		(1.234433)	
Number of obs	647				283	
Log likelihood	203.27				149.78	

Table 8: **Robustness Checks**

Variable	*Model (9)*		*Model (10)*		*Model (11)*	
POLCON_2002	-0.0051232	***	-.0108574	***	0.0001922	
	(.001786)		(.0038935)		(.002068)	
Culture Distance					-0.0002706	***
					(.000099)	
Legal Origin						
Law & Order	-0.0004838	***	-.0014468	***	-0.000646	***
	(.000165)		(.000366)		(.000212)	
Size_Revenues	2.86E-11		3.21e-11		9.53E-11	
	(.000000)		(7.02e-11)		(.000000)	
Technology	0.0000249		.000012		0.000014	
	(.000021)		(.0000267)		(.000023)	
Incumbent	-0.0000839		-.0002271		-0.0003893	**
	(.000195)		(.000253)		(.000193)	
Company Region	7.58E-06		8.48e-06		0.0000126	
	(.000014)		(.000018)		(.000015)	
SIC_code	0.0002771	***	.0003129	***	0.0002904	***
	(.000089)		(.0001114)		(.000010)	
Auction FDI Restricted	-0.0005553	***	-.000624	***	-0.0005711	***
	(.000165)		(.0002055)		(.000181)	
US_Dummy	.000684	***	-.0000622		0.0006183	***
	(.000170)		(.0004394)		(.000153)	
FMD_50_50	-0.0000357	***	-.000056	***		
	(.000012)		(.0000135)			
Language (Grimes)	-0.0006624	***				
	(.000144)					
Culture (Schwartz)			-.0019694	***		
			(.0005035)			
Plus_Minus					.0011351	***
					(.000234)	
Cons	7.607667	***	7.61117	***	7.605004	***
	(.000953)		(.001843)		(.000076)	
Number of obs	782		648		782	
Log likelihood	295.63		189.83		281.27	

Figure 2

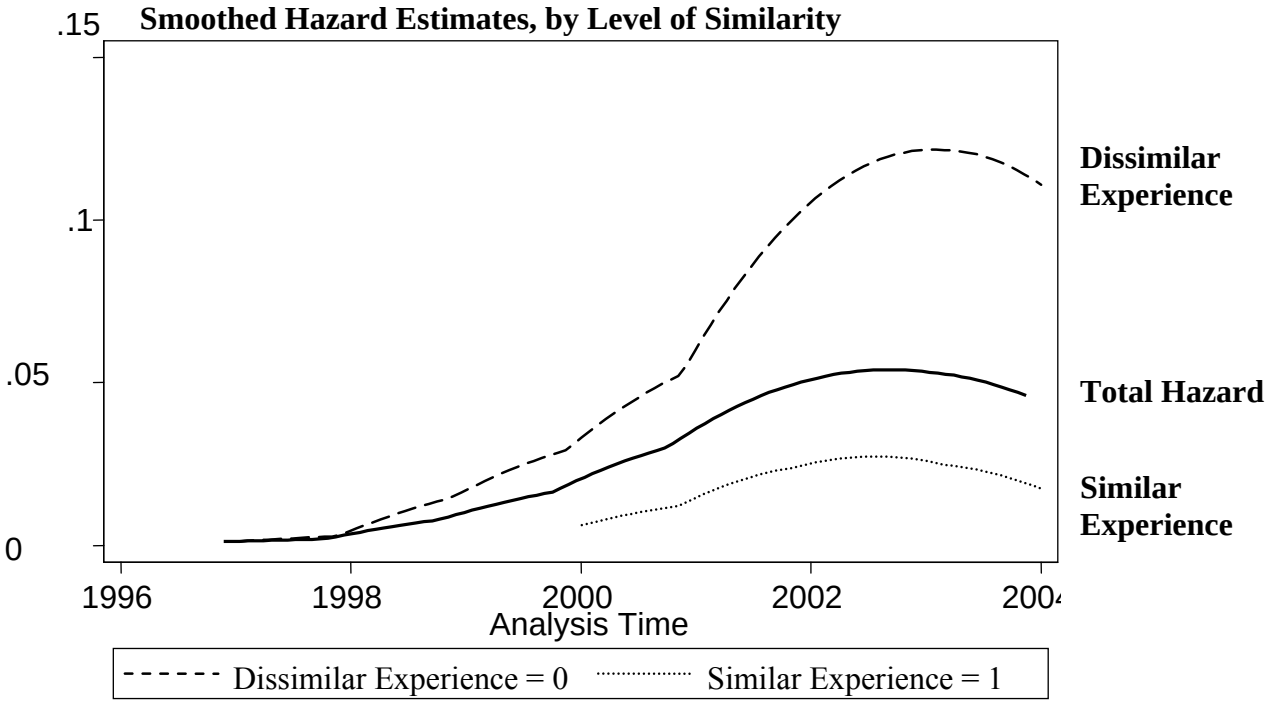
Smoothed Hazard Estimates, by Level of Similarity
.15
.1
.05
0
1996
1998
2000
2002
Analysis Time
Dissimilar Experience = 0
Similar Experience = 1
Dissimilar Experience
Total Hazard
Similar Experience

Table 9: Categorical Hazard Rates of Non-Experience FDI versus Similar Regulatory Experience

FDI Experience/Regulatory Similarity	***Hazard Rate***	***Success***	***Failures***	***Total***
No FDI/Similar Reg. Exp.	0.004	48	1	49
No FDI/Dissimilar Reg. Exp.	0.030	72	14	86
Yes FDI/Similar Reg. Exp.	0.007	444	19	463
Yes FDI/Dissimilar Reg. Exp.	0.024	160	24	184
Total		724	58	782

Appendix 7: Mechanisms driving performance – Proposed measurements

Accuracy of Cash Flow Prediction

I recommend a measure of the accuracy between the firms' ex ante cash flow predictions versus the ex post actual performance results. To capture predicted cash flow, I use privatization valuation data commissioned by the Brazilian Ministerio de Comunicacoes. Net cash flow for all investment years post privatization are obtained from the Comissão de Valores Mobiliários (CVM) and Gazeta Mercantile.

Better Project Selection

To measure better project selection of each firm, I recommend using one of two measures as the available data for each measure alone represents less than 30% of the sample. First, for all firms that entered Brazil through license auction, the auction price premiums above the government's minimum bid amount for the property are used to measure the firm's project selection ability. If this data is not obtainable, I use a modified version of a firm's payback period for the investment represented by: Payback period = # of years to a positive cash flow.

Exposure to Market Volatility

I recommend measuring a firm's ability to manage through market volatility by examining the change in the ex ante versus ex post quarterly earnings projections after an unpredicted shift in the regulatory governing regime. For instance, if a firm received positive returns in the first ear, the code would be 1, in five years, 5, and so on.