INTERNATIONALIZATION OF MOBILE NETWORK OPERATORS:
INSTITUTIONAL DISTANCE, REGIONAL EFFECTS AND COUNTRY FACTORS

A Dissertation in
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by
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ABSTRACT

Competition in the mobile telecommunications market is enhanced by entry of foreign mobile network operators (MNOs). Competition results in lower prices of mobile services that, in turn, can lead to increased levels of adoption. Despite these benefits, to date understanding of the drivers behind increasing international involvement (i.e., internationalization) of MNOs has not been systematically evaluated. Existing studies on internationalization in other domains have shown the importance of industry-, country- and regional-level factors in internationalization. Furthermore, differences in institutional environments between countries (known as institutional distance) have recently been shown to explain internationalization strategies of firms.

To that end, the goals of this study are to: 1) systematically evaluate MNO internationalization which, despite many rich case studies on internationalization of individual MNOs and MNOs in separate geographic regions, has not yet been done; 2) test the importance of industry-specific factors in institutional distance and their effects on MNO market entry from a home to a host country and 3) assess the impact of the regional dimension on MNO internationalization.

By achieving these objectives, this study makes the following contributions. First, it develops a theoretically-based framework that explains and predicts internationalization of MNOs. The framework considers several factors in MNO internationalization: institutional distance between the home and host countries of the MNO, regional factors and characteristics of the host country. A survival regression model is built and tested based on the framework using data on MNO entries into 36 countries of Europe and South America during the time period 1995—2006. Second, following institutional theory, this study combines the national- and industry-level measures of institutions, thus advancing international business research on the effects of institutional distance on market entry.

Results of this study show that internationalization can be explained by both institutional and regional factors. The differences between institutions of MNO’s home and host countries have a consistent effect on MNO entry as the MNO internationalizes. By comparison, the effect of regional experience on entry eventually decreases as the MNO enters more countries. Country characteristics, including the level of technology adoption and quality of life, were found to not have a significant effect on MNO entry.
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<th>Full Form</th>
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<tbody>
<tr>
<td>BIC</td>
<td>Bayesian information criterion</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FDI</td>
<td>Foreign direct investment</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross domestic product</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and communication technologies</td>
</tr>
<tr>
<td>LR</td>
<td>Likelihood ratio</td>
</tr>
<tr>
<td>M&amp;A</td>
<td>Mergers and acquisitions</td>
</tr>
<tr>
<td>MNO</td>
<td>Mobile network operator</td>
</tr>
<tr>
<td>UNCTAD</td>
<td>United Nations Conference on Trade and Development</td>
</tr>
<tr>
<td>VIF</td>
<td>Variance inflation factor</td>
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</table>
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1. INTRODUCTION

1.1 Problem motivation

Mobile telephony is seen as a logical completion of the “personal computing revolution” that started with the advent of IBM’s Personal Computer in 1981, which brought the power and resources of computing and subsequently the internet to offices and homes around the world and boosted productivity. The increasing capabilities of mobile phones and their ability to perform many tasks that were previously done on personal computers is particularly promising for developing countries, where adoption of computers has so far lagged behind developed nations (UNCTAD, 2007). Furthermore, many innovative business models are being built around mobile phones, such as the joint project between Vodafone and WWF in Tanzania. In this project, fishermen use mobile phones to obtain market and weather information, which helps them manage their time and find out the price of fish while offshore (Vodafone, 2006). Additionally, studies show that additional 10% in mobile technology adoption in an average developing country adds 0.5% to GDP per capita (Waverman et al., 2005). In summary, telecommunications have turned into a central driving force behind the development of information societies and a global information economy, rather than being a mere complement to economic development (Melody, 2001a; UNCTAD, 2007; World Bank, 2008).

Mobile telecommunications industry has experienced a surge in growth over the past decade. In 1995, only 8.2% of the population living in developed countries and 0.4% of people in developing countries had a mobile phone. By 2004 76.8% of people were mobile subscribers in developed countries and 18.8% in developing countries (International Telecommunications Union, 2006). In addition to reflecting the phenomenal growth, these numbers also indicate the closing gap between developed and developing countries, changing from a difference in penetration of 20 times in 1995 to only four times a decade later. Driving forces behind the growth in mobile telecommunications have been advances in technology and liberalization of telecommunications markets. However, although the divide has shrunk in relative terms, greater efforts are necessary to increase the level of mobile technology adoption in the developing world even if it may not be possible to achieve levels of adoption on a par with developed countries.

Adoption of mobile technology in a country requires large-scale investments to build infrastructure in order to provide mobile service. Firms that provide the service, mobile network operators (MNOs), provide such investments and build the infrastructure, thereby contributing to the level of development of the country. They also have to obtain licenses for mobile spectrum, which in some cases are provided for free but many times cost substantial amounts of money (for example, six third-generation licenses auctioned in Germany in 2000 cost the MNOs $51 billion). Thus, MNOs also contribute to the financial well-being of countries.

Many MNOs are partially or wholly owned by large multinational operators, and the number of instances of foreign market entry by MNOs has substantially increased in the past decade (Gerpott and Jakopin, 2005a). When MNOs enter a foreign country, investments they provide are, in effect, foreign direct investments (FDI). For many countries FDI bring in not only money but also new technologies and better business practices (Rossi and Volpin, 2006). This is especially true of developing countries. FDI by MNOs thus help improve infrastructure, promote higher levels of adoption of information and communication technologies and enhance business
practices. With these, developing countries are able to increase their productivity and overall well-being. In addition, improvements in mobile telecom benefit the existing stock of capital in the country as well.

Therefore, it is in the interests of national governments to promote entry of MNOs from other countries. Furthermore, given the importance of the regional dimension in firm internationalization (Rugman and Brain, 2003), regulatory structures at the regional level may also play a role in facilitating FDI in the region. However, not all governments have managed to create adequate conditions to attract FDI in mobile telecom, or to enjoy all the benefits that such FDI might bring. Governments and policymakers in developing countries that are considering or have only recently begun to attract FDI in mobile telecom can benefit from knowledge about conditions they should create in their country to attract more foreign firms.

A framework that explains MNO internationalization would thus be beneficial to governments and policymakers by making their efforts in attracting FDI from MNOs into their country more focused. It would also benefit MNOs, which would be able to relate their practices to general trends in the industry. This is particularly salient given the importance of the regional dimension in internationalization. MNOs from one region would be able to link their practices not only with other MNOs in the same region, but also with MNOs from other regions. It should be noted, though, that because such framework would not attempt to model behavior of decision-makers in MNOs, it would not provide insight on how actual internationalization decisions are made in MNOs.

Additionally, such framework would contribute to research on internationalization of MNOs. The regional orientation of internationalizing firms described above has been documented but is still largely unaccounted for in theoretical frameworks, and it has yet to be linked with some other theoretical developments in the studies of international business. By explicitly recognizing regionalization, such framework would advance theoretical understanding of internationalization.

### 1.2 Problem definition and scope

Although such multi-level framework that addresses MNO internationalization in a systematic manner would be very beneficial, to date there is a lack of consistency in the understanding of country- and regional-level drivers of MNO internationalization. This study addresses that problem by constructing a conceptual framework that explains entries of mobile network operators (MNOs) from a particular home country to foreign (host) countries. Foreign entries are regarded as part of the internationalization process of the firm, defined as the gradual increase in international involvement of firms (Johanson and Vahlne, 1977).

Internationalization of MNOs is seen as being driven by several factors: MNO characteristics, host country characteristics, institutional distance between the home and host countries of the MNO and regional factors. To test whether these factors indeed influence MNO internationalization, and whether they explain internationalization reliably, the study will answer the following research questions:
**RQ1** What factors influence internationalization of MNOs?

**RQ1a** How reliably does the selected set of factors predict internationalization behavior of MNOs?

In addition to the general factors mentioned above, studies of firm internationalization have shown that internationalization should be regarded within the context of the industry the firm operates in (Boter and Holmquist, 1996). This is even more salient in the mobile telecom industry, given its relatively high amount of regulation compared with some other industries. This study addresses these mobile industry specifics in MNO internationalization by asking the following question:

**RQ2** How do mobile industry-specific characteristics affect MNO internationalization?

Furthermore, MNOs usually follow a “learning curve” with respect to internationalization. As they start to internationalize, they seek host countries that are similar to their home country in some respects. One concept that accounts for such similarities is institutional distance, which includes country regulations, norms and culture (Kostova, 1999; Xu and Shenkar, 2002). The concept of institutional distance may also help explain the recent finding that most multinational firms do not operate on a global scale but rather are confined to their geographical regions (Rugman and Brain, 2003).

Two approaches to institutional distance have been used to date. These approaches are differentiated with respect to their treatment of context: “generic” (context is irrelevant) and “industry-specific” (context is relevant) institutional distance. However, empirical studies tend to use either one or the other approach, and little comparison between them has been done to date. I will test whether a combination of a generic and industry-specific institutional distance, which I will call hybrid institutional distance, better explains MNO internationalization than only generic or only industry-specific one. This leads to the following research question:

**RQ3** Does hybrid institutional distance better explain MNO internationalization than only generic or only industry-specific institutional distance?

Finally, I will link the concept of institutional distance with research on regional patterns of multinational activity by asking:

**RQ4** Does institutional distance between countries exhibit regional patterns?

To answer these research questions, I construct a framework of internationalization of MNO and operationalize a hybrid institutional distance. These are informed by three major bodies of research. The first one is institutional theory where the institutional distance construct has been operationalized. The second domain is internationalization of firms, which explains how firms internationalize and provides explanation for patterns of internationalization. The third domain is telecom policy studies, which explores, among other, effects of various policy and regulatory mechanisms on the telecom market.
This research covers 36 countries in two regions, Europe and South America. The timeframe of the research is 1995—2006. The model and the hybrid institutional distance are constructed using survival regression analysis based on the data set of MNO entries into foreign markets constructed during the study, as well as on secondary data.

1.3 Research merit

This research has both theoretical and practical merit.

From the theoretical perspective, this study empirically compares several theoretical approaches to firm internationalization, including the internationalization process model, the institutional distance approach and the regionalization approach. Furthermore, it compares the role of generic and industry-specific institutional factors in MNO internationalization. Finally, by creating a framework of internationalization of MNO, this study advances understanding of internationalization of firms in the mobile telecom sector.

From the practical standpoint, the results of research may assist policymakers at the national and regional policymakers in development of programs and policies of attracting FDI, in particular to the important mobile telecom sector, in the country or region. Furthermore, this research may help MNOs to compare their internationalization strategy with general trends in the industry or assist in development of such strategy if it is yet to be created.

The following section presents an overview of relevant literature.
2. LITERATURE REVIEW

A natural starting point for a discussion about internationalization of MNOs is the general theories of internationalization of the firm, which serve as the partial theoretical foundations of this study. In addition to internationalization theories, the theoretical foundations of this study are derived from institutional theory and institutional distance constructs that have been developed to date. Also important is the role of regional experience in internationalization. A review of each of these theoretical approaches is presented below. Having described the theoretical underpinnings, this section concludes with an overview of the empirical research on factors that influence FDI and internationalization in telecom, both mobile and fixed.

2.1 Theories of internationalization of the firm

To understand internationalization of MNOs, I first consider theories of internationalization of the firm in general. A variety of such theories have been developed to date, and they can be categorized into two groups: static theories, which do not explicitly account for a temporal dimension, and dynamic theories, which include a temporal dimension. These theories are summarized in Table 1.

Static theories of internationalization includes the internalization theory, the eclectic paradigm, transaction cost theory and the born-global theory. This group of theories, in addition to not accounting for the temporal dimension, considers factors internal to the firm as primary drivers of its internationalization. These internal factors, for example, help the firm allocate resources more efficiently (internalization theory) or achieve greater labor, material or transaction cost advantages (eclectic paradigm, transaction cost theory), which may lead the firm to internationalize.

More specifically, the internalization theory (Buckley and Casson, 1976; Hymer, 1976) argues that firm internalize their operations to deal with market imperfections such as uncertainty over future markets or government intervention. This allows for arranging value-added activities across borders. The eclectic paradigm (Dunning, 1980) suggests that the extent and pattern of international production is determined by ownership advantages, advantages of countries or regions in terms of location and advantages that the firm obtains from internalizing markets for a set of assets it possesses (Dunning, 2000:125). Transaction cost theory (Williamson, 1971) suggests that the mode of international expansion of firms, namely internationalization through contracts (e.g., creating a joint venture with a firm in the foreign country) or through hierarchy (e.g., creating a wholly-owned subsidiary of the firm in the foreign country) is influenced by transaction costs incurred by each option. Finally, the born-global theory suggests that some firms become international at or shortly after their inception. These firms are typically small and belong to an industry with high reliance on technology (Knight and Cavusgil, 1996).

The category of dynamic theories includes the resource-based view, the product life cycle theory and the internationalization process model. These theories explicitly include the temporal dimension, and, unlike most static theories, consider factors that are external to the firm, most
prominently characteristics of the host country market (product life cycle theory and internationalization process model).

<table>
<thead>
<tr>
<th>Theory</th>
<th>Dynamic or static</th>
<th>Manufacturing or services</th>
<th>Pattern or facilitators of internationalization</th>
<th>How environment is accounted for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internalization (Hymer, 1976)</td>
<td>Static</td>
<td>Manufacturing</td>
<td>None other than the ability to exploit internalized advantages</td>
<td>Structural and cognitive market imperfections</td>
</tr>
<tr>
<td>Eclectic paradigm (Dunning, 1980)</td>
<td>Static</td>
<td>Manufacturing</td>
<td>None other than the ability to exploit ownership, locational and internalized advantages</td>
<td>Given</td>
</tr>
<tr>
<td>Transaction cost theory (Williamson, 1985)</td>
<td>Static</td>
<td>Manufacturing</td>
<td>Contracts versus hierarchy (firms) in foreign activities</td>
<td>Given</td>
</tr>
<tr>
<td>Born-global theory (Knight and Cavusgil, 1996)</td>
<td>Static</td>
<td>General</td>
<td>None other than location of customers of the product or service (regardless of psychic proximity)</td>
<td>Given</td>
</tr>
<tr>
<td>Resource-based view (Penrose, 1959)</td>
<td>Dynamic with the accumulation of resources addition (Dierickx and Cool, 1989)</td>
<td>General</td>
<td>(Primarily intangible) resources that lead to creation of long-term competitive advantage</td>
<td>Given</td>
</tr>
<tr>
<td>Product life cycle (Vernon, 1966)</td>
<td>Dynamic</td>
<td>Manufacturing</td>
<td>Firm follows demand to less and less developed countries</td>
<td>Differences in level of development of countries</td>
</tr>
<tr>
<td>Internationalization process model (Johanson and Vahlne, 1977)</td>
<td>Dynamic</td>
<td>Initially tested in manufacturing</td>
<td>According to psychic distance</td>
<td>Important determinant of behavior</td>
</tr>
</tbody>
</table>

Table 1. Comparison of theories of internationalization (Sources: Andersen, 1997; Axinn and Matthyssens, 2002; Barney, 1991; Cantwell, 2000; Dierickx and Cool, 1989; Dunning, 1980; Johanson and Vahlne, 1977; Knight and Cavusgil, 1996; Törnroos, 2002; Williamson, 1985).

The resource-based view (Penrose, 1959) posits that firms internationalize when they possess resources that give them competitive advantage, and usually these resources are intangible. Furthermore, firms can search for and accumulate resources over time (Dierickx and Cool, 1989) — a temporal dimension that has been added later to this view. The theory of product life cycle (Vernon, 1966) views internationalization of firms as sequential process, with innovating firms first firmly establishing themselves in their home market and later, as production processes become standardized, they start exporting to other markets where customers are willing to pay a higher price for the innovative product, and eventually the firm would set up operations in large foreign markets. Vernon acknowledged later (Vernon, 1979) that his theory was less general than he originally suggested, but that it still might be used to account for firms that start internationalizing and to firms in rapidly industrializing countries, such as Mexico and Brazil. Finally, the internationalization process model (Johanson and Vahlne, 1977), also known as the Uppsala model, argues that firms internationalize in stages, first setting up operations in countries with close “psychic distance” to the home country of the firm and gradually expanding
after they learn more about the new market. The environment therefore is seen as an important determinant of firm’s internationalization behavior.

Thus, many theories consider internationalization as essentially static in the sense that they try to explain differences between entry modes of firms at a specific time (Andersen, 1997). Moreover, many theories consider the environment that firms operate in as given rather than conditioning behavior of the firms, in spite of the fact that internal and external barriers have been shown to negatively affect international performance (Cicic et al., 2002; Patterson and Cicic, 1995). Other critiques of the more traditional theories include the fact that they all focus on manufacturing rather than service firms (Axinn and Matthyssens, 2002), which presents a problem today when services account for a much larger share of GDP than manufacturing in developed countries.

The internationalization process model (Johanson and Vahlne, 1977) addresses some of these criticisms. It is not a static model but rather sees internationalization as a stepwise (and therefore time-dependent) process whereby firms increase the degree of their internationalization as they learn from their experience. Indeed, research in the institutional domain shows that firms can learn from other, especially competing, organizations by adopting mimetic behavior in the face of uncertainty (DiMaggio and Powell, 1983). Environment influences firms through the psychic distance between the home and the host countries of the firm: the internationalization process starts in the host country with the minimal psychic distance and gradually expands into more psychically distant countries.

The research undertaken in this dissertation conceptually builds upon the internationalization process model. However, this research is not interested in entry mode of the MNO, which is the focus of the internationalization process model and, indeed, most other theories of internationalization. Instead, attention is primarily drawn to environmental factors at various levels of analysis that facilitate the fact of entry. For that reason, the study also incorporates theoretical perspectives from other domains, namely institutional theory and telecom policy.

Advances in theory and practice since the time the internationalization process model was introduced have made some criticisms against it less significant, while amplifying others. The argument that the theories of internationalization are geared towards manufacturing firms is not as straightforward as it may first appear, because there are few “pure” services or goods — most products are a combination of the two (Buckley, 1991). With respect to the domain of this study, a telephone conversation is a service, but in fact subscribers pay not only for the service itself, but also for setting up and maintaining the physical facilities necessary for provision of the service (Dunning, 1989) as well as for handsets. Additionally, consumption of telecom services needs to coincide in place and time with its provision, making it a location-bound service (Boddewyn et al., 1986). Therefore, telecom can be seen as a combination of goods and services.

The concept of psychic distance is one of the more important in the internationalization process model. It is defined as “factors preventing the flow of information between firm and market” (Johanson and Wiedersheim-Paul, 1975), and it has been criticized from several perspectives. First, evidence from information and communication technology (ICT) sectors such as e-commerce suggests that firms can internationalize to psychically close and distant countries simultaneously, especially in an increasingly culturally homogenous world (Axinn and Matthyssens, 2002). Second, the concept includes several implied assumptions, both conceptual
and methodological, that may not necessarily hold across industries or geographical regions. Some of these assumptions include temporal linearity, indicating that firms enter more distant countries at later stages of internationalization; discordance, suggesting that different facets of distance may influence internationalization differently; and corporate homogeneity, indicating that all firms are equally affected by distance (Shenkar, 2001). Some of these assumptions may not always hold. Finally, researchers identified what is referred to as psychic distance paradox, which suggests that perceptions of firms with regard to psychic distance may not be true in reality and this can disrupt their operations in foreign countries (O’Grady and Lane, 1996). A recently introduced concept of born-global firm further diminishes the role of psychic distance for a particular set of firms. Born-global firms are defined as “companies that, from or near founding, obtain a substantial portion of total revenue from sales in international markets” (Knight and Cavusgil, 2005).

Thus, while the internationalization process model may be a useful tool for studying foreign market entry, it needs to be altered to accommodate for the uncertain status of psychic distance. The following section discusses one recently developed alternative to the psychic distance construct: institutional distance.

### 2.2 Institutional distance

The internationalization process model introduced the notion of psychic distance between countries, which was used to explain the path that firms follow when internationalizing. Firms were seen as progressively going from countries with smaller psychic distance from their home country to those with larger psychic distance (Johanson and Vahlne, 1977). This concept has evolved from a purely cultural one (Kogut and Singh, 1988) to the one encompassing many business and political factors, for example, legal and competitive environments, financial resources, language, education, or levels of industrial development (Dow, 2000; O’Grady and Lane, 1996). However, psychic distance did not account for many factors important to firms that operate in several countries. Perhaps the most significant drawback of this concept was the lack of attention to institutions (which influence telecom service through the regulatory environment of a country), in addition to the fact that it was poorly operationalized (Xu, 2001).

These criticisms are addressed by the concept of *institutional distance*, which is based on the notion of institutions. While a uniform conceptualization of institutions within the international business research community has yet to emerge, one conceptualization, based on the work of Scott (1995), views a country’s institutional profile as consisting of regulative, cognitive and normative components. Scott’s clear and understandable explication of the construct provides a sound theoretical base on which theoretical and practical advances have been made in the fields of international business (Gaur and Lu, 2007; Kostova, 1997; Xu and Shenkar, 2002), economics (Bénassy-Quéré et al., 2007; Busenitz et al., 2000), political science (Barnes et al., 2004; Laffan, 2001), organization science (Tempel and Walgenbach, 2007) and technology adoption (Munir, 2002). The concept of institutional distance has been used to explain foreign ownership strategy of multinational firms (Eden and Miller, 2004; Gaur and Lu, 2007), patterns of FDI (Bénassy-Quéré et al., 2007), international trade flows (Beugelsdijk et al., 2004) and increasing
homogeneity of organizational forms across countries (Tempel and Walgenbach, 2007), among others.

Thus, institutions are a multi-faceted construct that are applied in a wide variety of contexts. Furthermore, as Scott (1995) notes, institutions permeate several levels of analysis, from the organizational subsystem (part of an organization) to the world system (global level). This distinction among levels of analysis is helpful in defining and understanding different factors that may be at play at each level.

The complex nature of institutions may be one reason why not all researchers follow the separation of institutions into the three components. Nonetheless, many agree that institutions consist of both formal (typically regulative) and informal (normative and cognitive) constraints (Bénassy-Quéré et al., 2007; Demirbag et al., 2007; Eden and Miller, 2004; Rodrik, 2006; Scott, 2001). While some researchers combine the normative and cognitive components into a single measure (Gaur and Lu, 2007), others have empirically validated that these three components are distinct (Busenitz et al., 2000; Yamakawa et al., 2008).

Institutions served as the foundation on which the concept of institutional distance was operationalized. Institutional distance can be classified into two major types according to their treatment of context into generic (where context is irrelevant) and industry-specific (context is relevant). Generic institutional distance considers the overall institutional environment (Daude and Stein, 2007; Rodrik et al., 2004) and industry-specific one is related to a particular industry or a specific area of inquiry, such as entrepreneurship (Busenitz et al., 2000; Kostova, 1997). Given the multi-level nature of institutions, each type of institutional distance may be more relevant to a particular level of analysis. However, little comparative analysis of these two types of institutional distance and of the areas of applicability of each has been performed to date.

The following paragraphs examine the nature of the three components of institutions in further detail.

2.2.1 Regulative component

The regulative component of institutions reflects formal constraints in the form of rules and regulations that exist in the society (Scott, 2001:51). Examples of such formal constraints are laws, government regulations and policies that promote particular types of behavior.

While researchers outside of the contemporary institutional tradition sometimes do not include informal components in their operationalizations of institutions, both institutional and non-institutional scholars largely agree on the importance of the regulative component in the definition of institutions. Indeed, for many scholars in economics the notion of institutions is primarily reflected by these formal constraints imposed by governments or regulating bodies (e.g., Acemoglu et al., 2004; Rodrik et al., 2004).

The regulative component of institutions has been shown to play an important role in attracting FDI, as well as in economic development in general. In particular, a stable and predictable regulatory infrastructure without excessive regulatory burden in a country has been shown to
lead to a higher amount of inward FDI into that country (Bénassy-Quéré et al., 2007; Daude and Stein, 2007; Globerman and Shapiro, 2002), to increase the amount of foreign trade (Cheptea, 2007) and to result in higher growth, productivity (Globerman and Shapiro, 2002) and income levels (Rodrik et al., 2004).

Several data sources have been used by researchers to operationalize the regulative component of institutions. A research group at the World Bank led by Daniel Kaufmann (Kaufmann et al., 2002) developed a series of governance-quality indicators, which consist of six sub-components. These components are constructed using secondary data from a variety of sources, such as surveys, as well as from hard data. Primarily done in the field of political economy, studies that use these indicators tend to assess the impact of the country’s institutions on overall FDI regardless of the domain or industry (e.g., Linders et al., 2005) or only analyze host country institutions (e.g., Daude and Stein, 2007). Researchers typically either use one of the sub-components (Oliva and Rivera-Batiz, 2002) or average all or some of the sub-components (Daude and Stein, 2007; Easterly et al., 2006; Rodrik et al., 2004).

Another data source used in empirical studies is the Global Competitiveness Report published by the World Economic Forum (World Economic Forum, 2006). The Report consists of several meta-components of competitiveness of countries, and has been used in international business research in cross-section studies of entry mode choice (Xu, 2001; Yiu and Makino, 2002) and ownership strategy (Delios and Beamish, 1999; Xu, 2001) of multinational firms. The regulative component is operationalized using a combination of components of competitiveness. However, although the Report may be a valid choice for cross-section analysis, it is harder to use for time-series analysis, since its structure is not stable over time: some editions do not contain measures that are present in others.

2.2.2 Normative component

The normative component reflects norms and values that exist in a society, thus reflecting appropriate and desirable models of behavior, as well as specifying the way in which things are expected to be done (Scott, 2001:55). This component of institutions can thus manifest itself as a barrier to entry for MNOs (Kostova and Zaheer, 1999; Xu and Shenkar, 2002). Indeed, because of variation in institutional environments across countries, MNOs face the necessity of establishing and maintaining legitimacy in several institutional environments simultaneously to avert the risk of being treated discriminatively in each (Eden and Miller, 2004). This is harder to attain in the case of the normative than in regulative component, since norms are often neither externalized nor made readily available, especially to outsiders (Scott, 2001:55—56).

An appropriate measure to account for the normative component of institutions is the Rule of Law component of the World Governance Indicators. The Rule of Law measures the extent to which the rules established in the society are trusted and followed. However, previous studies have shown that a significant correlation between the Regulatory Quality and the Rule of Law components is expected (Daude and Stein, 2007; Mauro, 1995). This may prevent the use of the Rule of Law component to operationalize the normative component of institutions.
An alternative measure for the normative component may be data on cross-border mergers and acquisitions (M&A). The amount of cross-border M&A in a country indicates the strength of a corporate governance regime. Furthermore, it has been shown that M&A activity volume is higher in countries where accounting standards are higher and shareholder protection is stronger (Rossi and Volpin, 2006). This measure therefore may serve as a proxy for corporate norms and values, indicating, among other, the integrity of business conduct in a given country. This measure may thus suit well the purpose of accounting for norms and values of a country’s business environment.

It is important to draw the distinction between M&A and FDI. FDI is defined as investment that “reflects the objective of a resident entity in one economy obtaining a lasting interest in an enterprise resident in another economy” (IMF, 1993). By contrast, M&A refer only to a purchase by one company of another, foreign company (acquisition), or an agreement between two companies from different countries to “go forward as a new single company” (merger) (UNCTAD, 2005). In other words, while M&A is part of FDI, they do not denote the same concept, with FDI being a broader concept that, in addition to M&A, also includes another major component of greenfield investment, or investing in a startup abroad.

2.2.3 Cognitive component

The cognitive component is a reflection of shared beliefs and perceptions on what constitutes social reality and meaning in the society (Scott, 2001:57). As such, this component is semantically close to culture, and Scott has referred to it as the cognitive-cultural component.

It is not surprising then that most operationalizations of the cognitive component are based on measures of culture. Perhaps the most widely used cultural measure is Hofstede’s (1980) dimensions (Busenitz et al., 2000; Kogut and Singh, 1988; Shenkar, 2001). However, aside from methodological problems (see, e.g., Baskerville, 2003; McSweeney, 2002), these measures have been calculated for only 53 out of the 192 countries in the world today. A major expansion and update of the indicators that was conducted in 2004 still accounts for only 62 countries (House et al., 2004). Alternative measures have generated theoretical advances in our understanding of culture (e.g., Leung et al., 2005; Schwartz, 1994; Smith et al., 1996), but they too face the same problem of global coverage.

In a significant departure from the methodology described above, some researchers suggested operationalizing culture based not on perceptive measures, which need to be captured (e.g., through a survey or interviews) after they are operationalized, but on readily available cultural characteristics such as differences in language and religion (Ghemawat, 2001; Leung et al., 2005).

Linguistic similarities are an indication of a common relationship between two countries, currently or in the past (Matei, 2006), which in turn is an indicator of differences in values and norms. People’s religious affiliations, on the other hand, capture attitudes towards work ethic, conservatism as well as individuality vs. collectivism, among others, which have been used in various operationalizations of cultural dimensions (Leung et al., 2005). An additional benefit of using linguistic and cultural variables compared to cultural dimensions constructed from surveys
is that they are readily available and can be used by researchers and practitioners for studies of the widest geographic scope.

2.2.4 Culture: normative or cognitive?

An important caveat regarding the treatment of culture should be noted. Although the theoretical grounds for each of the normative and cognitive components has been well developed (Scott, 1995), there is a certain incoherence regarding the operationalization of these two components. Scott notes that the normative component reflects norms and values, while the cognitive one (which he calls cultural-cognitive) describes shared beliefs and perceptions in a society. Many researchers have used some measure of culture (e.g. cultural distance of Kogut and Singh (1988)) in operationalizations of institutional distance. However, some use culture to operationalize the normative component (Busenitz et al., 2000; Demirbag et al., 2007; Yiu and Makino, 2002), while others use it for the cognitive one (Bruton et al., 2004; Xu, 2001). Still others do not make a conceptual distinction between the normative and cognitive components (but they do separate out the regulative one) and use a single measure to account for both (Gaur and Lu, 2007; Eden and Miller, 2004).

In this research, I attribute culture to the cognitive component and use all three components of institutions following the theoretical foundations laid by Scott (1995).

2.3 Role of regional experience

In addition to national-level institutional distance factors, international market entry may also be influenced by characteristics of the region. Besides entering individual nations, firms engaging in a more aggressive strategy may pursue internationalization through either a regional or global strategy (Axinn and Matthyssens, 2002; Cook and Kirkpatrick, 1997; Schlie and Yip, 2000). Rugman and Brain (2003) show that of the 500 largest multinational firms that collectively account for over half of the world trade, very few are pursuing a truly global strategy.

Alternatively, the regional strategy enables firms to overcome certain problems faced by those pursuing a global strategy. Such problems include diversity of standards, customer demand for locally differentiated products, critical importance of being an insider (which is far easier attained by being a regional rather than global company) and difficulties of managing global organizations (Morrison et al., 1991).

Performing operations outside of the firm’s home country is becoming increasingly easy as markets move towards further integration (Ghemawat, 2003). This and the realization by the managers that international operations are of critical importance has given rise to “global mania,” with globalization of competition and pursuance of global strategies by companies (Morrison et al., 1991). Nonetheless, global markets are still far from perfect integration, despite postwar multilateral free trade principles that view regional trade blocs as “suboptimal arrangements” (Poon, 1997). This situation is described by Ghemawat (2003) as semiglobalization, and it is likely to remain as such for a considerable time (although in the case of trade, regionalism is
viewed as a “building block” (Frankel and Wei, 1998) to further trade liberalization. Because of this, most multinational firms may in fact have a regional scope of operations (Elango, 2004).

Pursuing a regional strategy has several advantages. Costs of coordination in regional markets (as compared to global) are reduced, subsidiaries are easier to manage because of close geographical distance, degree of learning is lower (Elango, 2004), the firm is sensitive to regional demand preferences and has the insider advantage (Schlie and Yip, 2000). Overall, regional strategies allow reaping advantages of economies of scale and scope without the risks associated with operating on a global scale (Rugman and Brain, 2003).

2.4 Country characteristics

Having reviewed theoretical developments in internationalization of firms, the discussion now turns to empirical research on country characteristics that influence FDI in general as well as specifically in the telecom domain. This section reviews country characteristics that were found to be important determinants of FDI in domains other than telecom, and the next section discusses telecom-specific factors.

Because MNO entry into a country is, in effect, part of overall FDI that a country attracts, the country characteristics that may potentially influence MNO entry are drawn from the broader research on overall inward FDI as well as from the telecom context. Quality of life in a country has been shown to be an important determinant of FDI in a country (Cheng, 2006; Globerman and Shapiro, 2002) with a positive relationship between quality of life and FDI. Higher quality of life leads to fuller realization of human potential, generally giving the population access to more advanced educational and health care facilities. This, in turn, increases the skill level and life expectancy of the workforce and potential consumers of the firm’s product, which has been shown to be associated with higher levels of inward FDI (Globerman and Shapiro, 2002; Mody and Srinivasan, 1998).

It has also been demonstrated that FDI has a strong reinforcing effect on itself (Cheng and Kwan, 2000; Dunning et al., 2007). In other words, larger amounts of inward FDI in the present lead to even larger amounts of FDI in the future. This is due to establishment of particular inputs, such as skilled labor, services for marketing and distribution, as well as gaining reputation in the host country market (Wheeler and Mody, 1992). This reinforcing effect of FDI is also consistent with the internationalization process model, which predicts gradual expansion of operations not only into new markets, but also in the markets the firm already established its presence in as the firm gains more experience in that market (Johanson and Vahlne, 1977).

The size of the host country market positively affects the inflow of FDI, all else being equal. Firms investing into a larger market have fewer concerns regarding achieving sustainable level of operations (Caves, 1993). Because the domain of this study is mobile telecommunications, the size of the host country market can be well described by the number of existing mobile subscribers in the country: larger number of existing subscribers indicates a smaller market (proportionate to overall population).
2.5 Internationalization in fixed and mobile telecom

Research on fixed telecom industry has identified several factors behind internationalization of firms in this sector. Internationalization is seen as a possibility to reap early-mover advantages and obtain a large share of a foreign market by quick entry, especially in unsaturated markets (Sarkar et al., 1999). Additionally, operators can internationalize in an attempt to take advantage of the convergence in regulatory norms and business practices (Joseph, 1995), to directly serve a new market or diversify an operator’s investment portfolio (Sarkar et al., 1999).

However, fixed telecom is a more regulated industry than mobile and, as Sarkar et al. (1999) note, fixed has been an industry with a relatively low degree of internationalization prior to 1990s due to an approach to the industry based on the exclusivity of national service providers. Thus understanding of the extent to which patterns and factors of internationalization in fixed telecom can be applied to the mobile domain requires further investigation.

In the realm of mobile telecom, an MNO has two major options for internationalization: through its existing subscribers (providing international connections and roaming to its existing customers) and through obtaining new customers in a foreign country (Gerpott and Jakopin, 2005a; Henten, 2001). This study focuses on internationalization through obtaining new customers, as this is the case when the MNO brings FDI into a foreign country.

While little systematic evaluation of internationalization of MNOs has been performed to date, rich case studies of individual internationalization occurrences as well as national- and in some cases regional-level studies provide indication of factors that may influence MNO internationalization. These factors are reviewed below.

Cultural and geographical similarities. Countries that are culturally or geographically close to the MNO home country are more likely to be entered by the MNO. For example, Scandinavian operators focused on expansion to Baltic countries and Deutsche Telekom from Germany concentrated on markets geographically close to Germany (Whalley and Curwen, 2004). However, studies of larger internationalization patterns based on psychic dispersion (Ronen and Shenkar, 1985) did not provide an adequate explanation of internationalization (Whalley and Curwen, 2006), indicating that factors other than culture may be at play.

A related influence comes from regional factors. Accession of new countries to the EU in 2004 and 2007 made the new members more attractive to investors from the “old Europe” (Whalley and Curwen, 2004). Overall, MNOs tended to confine their investments to a single region as of 2004, leading to a conclusion that many MNOs are regional in their internationalization activities (Whalley and Curwen, 2005b; Whalley and Curwen, 2003). Evidence for the regionalization pattern comes as well from other parts of the world. In Latin America three out of four companies that operate in Brazil also control most of the Latin American market (Maciel et al., 2005). Eastern European and Central Asian countries are the primary target of internationalization for Russian MNOs (Lisitsyn et al., 2005). Within regions, operators typically pursue two basic strategies: they concentrate either on major markets (in Europe these are France, Germany, Italy, Spain and the UK) or on sub-regions (Scandinavia, Central and Eastern Europe) (Whalley and Curwen, 2005a; Whalley and Curwen, 2003).
Another factor is *saturation of the host country market* in the sense of a maximum number of MNOs a country can sustain. European countries generally have no more than four 2G operators, with the exceptions being the Netherlands and Turkey (Whalley and Curwen, 2003).

In many cases *third-generation license allocations* were specifically designed by regulators to attract new operators to the market. Perhaps the most prominent example in Europe is Hutchinson Whampoa, an MNO from Hong Kong which operates almost exclusively third-generation networks in Europe. Interestingly, new generations of wireless may extend the size of the market for mobile services, thus decreasing the level of market saturation (Rieck et al., 2004). Furthermore, many MNOs tend to use the same technology across all of their subsidiaries in an effort to cut costs and reap economies of scale (Gerpott and Jakopin, 2005b).

### 2.6 Institutional and regional factors in mobile telecom

Reforms in the telecom sector in many countries have led to privatization of state telephone companies, increased and stimulated competition and creation of independent regulators in the industry. These reforms were caused by the advent of new technologies and increased threats to country’s competitiveness if reforms were not conducted in areas related to telecom, such as computer and software industries (Cowhey and Klimenko, 2001). Generally, telecom reforms separated the telecom legislative process, regulatory functions and provision of service that had been fulfilled by a single body.

In some countries, reforms in telecom were driven by local forces. Existing institutions were increasingly proving inefficient and inadequate in the face of changes in social, political and economical environments. Changes in technology were also affecting the existing “order” of telecom regulation, and reforms were an answer to the new circumstances (Melody, 1999). In other countries, however, the reason to conduct reforms resided primarily outside of the country, with transnational forces and policy harmonization being the main drivers of telecom reform (Bartle, 2002).

In countries where the reforms were implemented, regulatory functions are performed by a body that functions separately from the government or telecom operators. As observed by Córdova-Novion and Hanlon (2003), nominal independence of the regulator is provided through various means, such as by statute or through a ministerial or presidential order. Levi-Faur (2004) shows that by 2002 all of the 14 European Union countries he included in his review had a nominally independent telecom regulatory authority, while in Latin America this number was 10 out of 16.

The goal of regulators is to ensure that public policy objectives of telecom are met. This includes, in particular, spectrum licensing, or the process by which authorizations to provide telecom services in a particular spectrum band, are awarded. There are several dominant selection criteria, including “first come, first serve” used in the early days of commercial mobile telephony, comparative evaluation, which is based on subjective assessment (“beauty contest”), pure auction, and a combination of auction and comparative evaluation criteria. Conditions of operation, such as coverage obligations, can also be included in the terms of the license (Intven et al., 2000:2-25).
Thus, MNOs are regulated at many stages and in many aspects of their operations, which indicates a substantial burden of regulation in the mobile telecom industry. To start operation, they should obtain or win a license, and continuing operations occur under the scrutiny from regulators.

2.7 Summary

The discussion above has identified several factors that are likely to influence market entry of an MNO. These factors include institutional distance, regional experience, host country factors (the degree of saturation of the market, quality of life and the overall amount of FDI), as well as telecommunications policy factors at the regional and national levels.

An integrated research on these factors would make fundamental contributions to the domains of international business research and telecom, as will be shown in the next section.
3. THEORETICAL FRAMEWORK

The framework developed in this study builds on the theoretical perspectives discussed above. More specifically, the theoretical framework conceptually draws on three major perspectives, each of which allows consideration of different aspects of MNO internationalization: the role of generic and industry-specific institutional distance, the role of MNO’s regional experience and characteristics of the host country.

An integral part of the theoretical framework is a measure of institutional distance. I operationalize and use a hybrid institutional distance measure, which contains both generic and industry-specific components. This measure compares existing approaches to institutional distance and their role in MNO internationalization behavior.

The following two sections describe the theoretical framework by first considering institutional distance and then discussing the model of MNO internationalization. These are followed by the introduction of hypotheses relevant to MNO internationalization and institutional distance, which are tested in this study.

3.1 Generic and industry-specific institutional distance

Institutional distance is based on the three components of institutions: regulative, normative and cognitive (Scott, 1995). One of the goals of this study is to compare the influence of generic and industry-specific institutional factors on MNO internationalization. Given the importance of the two approaches that was verified empirically, I propose a hybrid approach to operationalizing institutional distance. A hybrid measure of institutional distance consists of both generic and industry-specific components. However, it is not intended to replace either of them: in particular studies the domain specificity may not be significant, and the generic distance could be used. An obvious challenge in developing a hybrid measure may be poor availability of data.

This study operationalizes the hybrid institutional distance measure for all three components of generic institutions using publicly available data sources. For industry-specific institutions, only the regulative component, which is arguably a significant feature of the mobile telecommunications industry, is operationalized. While ideally the hybrid approach would be used for all components of both the generic and industry-specific measures, data availability has not made this possible.

The hybrid institutional distance measure used in this study is shown in Figure 1.

I calculate institutional distance as the difference of the regulatory, cognitive and normative components of institutions between two countries. With regard to generic institutional distance, the regulative component is operationalized based on the Regulatory Quality component of the World Governance Indicators (Kaufmann et al., 2004), the normative component is operationalized as the amount of cross-border M&A in a country and the cognitive component is based on linguistic and religious data for a country.
The industry-specific regulative component consists of two measures, which were chosen to capture factors essential in both making a greenfield investment as well as in engaging in an M&A. In other words, these regulative measures address the two methods by which an MNO can enter a country. These two measures are the existence of an independent telecom regulator and the method of allocating spectrum licenses. It has been noted that the major component of telecom reforms is the separation of policy, regulatory and operational functions of telecom (Intven et al., 2000:1-3; Melody, 2001b). Thus, the existence of separate regulators in the country is included in industry-specific institutional distance.

Another important part of telecom regulatory environment, particularly in its relation to entry, is spectrum licensing, which can take several forms, from extension of an existing license through “first come—first serve” and beauty contests to auctions. In practice, allocations often combine features of two or more of these methods, however I classify the method used at each licensing event as one of these basic types for consistency. Spectrum licensing method is thus another component of the industry-specific institutional distance.

While other industry-specific factors could have been included in the index, they would require substantial additional data collection efforts. Unlike generic institutional variables, many of which have been operationalized and regularly updated by international organizations such as the World Bank and the United Nations, mobile telecom-specific data is scattered across a wide variety of sources, including news and individual MNO reports. Including these variables would thus counter one of the objectives of this research, namely to rely on sources of data that are publicly available and can be easily used by other researchers. Collecting these data may constitute the objective of future research which, given the large amount of data to be collected, may require significant research efforts.

It should be noted that my approach to regulative and normative components of institutions permits a stand-alone, as opposed to a relative, operationalization. In other words, for these two components one can establish a scale with minimum and maximum values along which the regulatory and cognitive components are measured, and speak, for example, of good regulation (in the case of the regulatory component) or quality business practices (for the normative
component). In calculating institutional distance I take the absolute value of the difference between these components for the host and home countries.

The cognitive component does not permit such stand-alone operationalization. Knowing, e.g., that 50% of population of a potential host country speaks French and 70% are Protestants is not necessarily meaningful for an internationalizing MNO. On the other hand, knowing, for example, that the religious profile of the host country does not significantly differ from the company’s home country but linguistic profile does, is significant. This means that while the company may face a linguistic barrier, values and norms that are held by individuals in both countries are likely to be similar due to a shared religious affiliation.

The following section discusses the framework of MNO internationalization, the manner in which generic and industry-specific institutional measures are included in it, and the subsequent section formulates hypotheses for the study.

### 3.2 Framework of MNO internationalization

The framework conceptually draws on three major theoretical perspectives. First, the framework builds on the internationalization process model of the firm and investigates the role of previous experience in MNO internationalization (Johanson and Vahlne, 1977). Second, constructs from the institutional theory are used, and the effect of the generic and industry-specific types of institutional distance on internationalization is considered (Kostova, 1997; Scott, 2001). Third, building on regionalization studies, this research seeks to test the role of the region in internationalization (Rugman and Brain, 2003). Finally, the framework also includes characteristics of the host country that have been demonstrated as significant determinants of MNO entry in studies of mobile telecom and FDI in other domains. Several factors that cover important determinants of FDI as indicated in the literature, namely human capital and market factors, are included. These are complemented by the factor that reflects the regulated nature of the mobile telecom industry. More specifically, the host country characteristics included in the framework are the quality of life, which leads to fuller realization of human potential and thus may broaden the base of the population that are receptive towards technology and are more likely to afford it. The overall amount of FDI in the country are also included, since FDI were shown to have a reinforcing effect on themselves, and MNO entry constitute part of overall FDI that a country attracts. The level of technology adoption, which indicates the market size for the potential MNO and thus is likely to influence its entry, is also included. Finally, because mobile telecom is a regulated industry, inclusion of this factor will test whether FDI in regulated industries show different dynamics than overall FDI in the country.

The resulting framework, including hypothesized relationships with MNO entry (negative or positive), is shown on Figure 2.
In addition to specifying what the framework includes, it is also important to note what it does not include. The framework does not distinguish between different modes of entry and does not evaluate the effect of internationalization on MNO performance. While these problems are by all means important, they would shift the focus of the study to the firm level and bring into consideration a host of theories and frameworks of modes of entry and firm decision-making, which are beyond the scope of this study. Equally, this study does not attempt to investigate the decision-making process or consider behavioral assumptions about how decisions in MNOs are made.

Overall, the conceptual framework reflects recent findings and trends and proposes that MNO entry in a country is conditioned upon several factors: institutional distance between the home and host country, regional factors and characteristics of the host country. It has been shown (Rugman and Brain, 2003) that internationalization is primarily regional, not global, and hence this study accounts for regional experience. Additionally, by including both the generic and industry-specific measures of institutional distance, this study tests for the relative importance of institutional factors in the mobile telecom domain.

The dependent variable is entry of an MNO from one (home) country to another (host) country. It is operationalized as the instance of entry in a particular year and is a binary variable, which equals 0 if the MNO is not present in the country and 1 if it is. This research seeks to understand,
among other things, what factors affect MNO entry and time from the beginning of the internationalization process to entering a particular country.

To systematically assess the impact of various factors on MNO internationalization and answer research questions, I now proceed to formulate hypotheses for this study.

### 3.3 Hypotheses

#### 3.3.1 Generic and industry-specific institutional distance

Previous research showed that institutional distance affects international business activities (Busenitz et al., 2000; Daude and Stein, 2007; Kostova, 1996; Xu and Shenkar, 2002). However, existing studies use either only generic or only industry-specific measures of institutional distance. I use a hybrid approach and include both generic and industry-specific measures in the model to test relative merits of each in explaining MNO internationalization.

Furthermore, the internationalization process model suggests that firms internationalize to countries with successively greater psychic distance from their home country. Transferring this logic to the level of institutional distance, it can be expected that MNOs internationalize to countries with successively larger institutional distance from their home country. The corresponding hypotheses are:

| \( H1a \) | **Generic institutional distance** between the home and host countries of the MNO is negatively related to MNO entry into a host country. |
| \( H1b \) | **Industry-specific institutional distance** between the home and host countries of the MNO is negatively related to MNO entry into a host country. |

Given the multi-level and multi-faceted nature of institutions, including both the generic and industry-specific measures in this study may add to understanding of the role of institutions in MNO entry. To test whether adding the industry-specific institutional distance to the generic one indeed contributes to the explanation of MNO internationalization, I hypothesize:

\( H1c \) Including an industry-specific institutional distance in the model improves prediction of MNO entry over the model with a generic distance only.

If this hypothesis confirmed, this study will lend support to the idea that in the case of mobile telecom, the hybrid institutional distance measure better explains internationalization than the generic institutional distance measure alone.
3.3.2 Role of regional experience and regional factors

Some researchers have pointed out that most multinational companies are regional, not global, in their operations (Rugman and Brain, 2003). Thus, a framework that aims to explain MNO internationalization should include regional factors. The regional level of analysis also resonates with the concept of learning from the internationalization process model as well as with research on institutional distance. These state that firms internationalize to host countries according to the institutional distance between the home and host countries. Since the proposed framework is based on these theoretical and practical developments, it accounts for regionalization by including a variable that reflects the amount of MNO experience in the region. Therefore I hypothesize:

**H2a** Previous entries into other countries of the same region by the MNO are positively associated with MNO entry in a country.

Although the telecom industry has been significantly liberalized and deregulated, governments still have control over conditions of MNO entry and subsequent operation in the market. In many countries details of these conditions are determined by national governments and regulatory authorities. However, with the growing importance of regions, it can be expected that some of these conditions are harmonized across members of the region. Depending on the level of integration within a region, the regional authority may have more power than national ones. Therefore, the regional level of analysis can be seen as increasingly important in telecom regulations. Consequently, I expect it to have a significant influence on entry of MNOs in member countries of the region. The respective hypothesis is:

**H2b** Presence of a regional-level telecom regulator is positively associated with MNO entry in a member country of the region.

Although the concept of institutional distance was introduced a decade ago, some basic characteristics of this measure are yet to be explored. One of these characteristics is institutional similarity between different regions. Investigating this is even more important in light of the rise of the regionalization approach in international business. Additionally, a bridge between the regional and institutional distance research has yet to be built. Understanding the nature of institutional distance within and between regions may help reconcile these two approaches as well as help explain firm entry within and between regions.

To that end, I explore regional similarities in both generic and industry-specific institutions. Regional-level institutions are operationalized as the presence of regional bodies that promote discussions between regulators of member countries. Such bodies facilitate elite networking or policy harmonization through emulation throughout the region (Bennett, 1991).

Presence of regional-level telecom institutions contributes to harmonization of regulatory environments in member countries. Additionally, it can be expected that at least some countries in the region are close to each other with respect to other institutional components. Although some individual countries may have more in common with countries outside of the region than within the region, I hypothesize:
3.3.3 Influence of other factors on MNO entry

I also include variables with host country characteristics in the framework to test for effects specific to the host country. These variables are the quality of life, the amount of FDI and the level of technology adoption.

Quality of life in a country has been shown to be an important determinant of FDI in a country (Cheng, 2006; Globerman and Shapiro, 2002) with a positive relationship between quality of life and FDI. Following the logic used by Cheng (2006) in his study of location choices of Japanese investors in China, I assume that higher quality of life is associated with higher income levels, which create and stimulate the demand for mobile services. Therefore, countries with higher quality of life should represent a more attractive market for an MNO, ceteris paribus. The corresponding hypothesis is:

**H3a** A country’s **quality of life** is positively associated with MNO entry in a country.

It was shown that FDI has a strong reinforcing effect on itself (Cheng and Kwan, 2000). I account for this self-reinforcing effect by including the amount of FDI per capita in the framework. Another reason for including this factor in the framework is that the (proportionate) amount of FDI a country attracts represents its economic openness (Reuveny and Li, 2003). It can be expected that MNOs, as other multinational companies, prefer to invest in countries that are more open to foreign investment. Therefore I hypothesize:

**H3b** The amount of **FDI per capita** in a country is positively associated with MNO entry into the country.

Level of technology adoption describes how advanced a country is in terms of infrastructure development and adoption of information and communication technologies. This variable also describes market size in the telecom industry, and market size is one of the few determinants of investment that most researchers agree on (Chakrabarti, 2001). Thus, lower levels of adoption of mobile technology indicate larger market size, which can be expected to be more attractive to the MNO. The corresponding hypothesis is:

**H3c** **Level of technology adoption** in a country is negatively related to MNO entry in a country.

The following section summarizes the independent variables included into the framework.
3.4 Summary of independent variables

Operationalization of the variables included in the model and institutional distances is shown in Table 2. Subscripts at variables indicate dimensions across which the factor varies: \( j \) indicates home country, \( k \) host country and \( t \) year.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Variable group</th>
</tr>
</thead>
<tbody>
<tr>
<td>( INST_REG_{jkt} )</td>
<td>Difference in the regulative component of institutions (regulatory environments) between the ( j )th (home) and ( k )th (host) countries of the MNO in the year ( t ).</td>
<td>Generic institutional distance</td>
</tr>
<tr>
<td>( INST_NORM_{jkt} )</td>
<td>Difference in the normative component (attitudes and norms) between the home and host countries.</td>
<td></td>
</tr>
<tr>
<td>( INST_COGN_{jkt} )</td>
<td>Difference in the cognitive component (cultural distance) between the home and host countries.</td>
<td></td>
</tr>
<tr>
<td>( INST_D_REG_{jkt} )</td>
<td>Difference in industry-specific institutions (quality of telecom regulation) between the home and host countries. It is operationalized as the existence of an independent regulator.</td>
<td>Industry-specific institutional distance</td>
</tr>
<tr>
<td>( INST_D_LIC_{jkt} )</td>
<td>Difference in industry specific institutions (spectrum licensing policy) between the home and host countries. It is operationalized as the predominant selection criteria for licenses.</td>
<td></td>
</tr>
<tr>
<td>( PREVENTR_{jkt} )</td>
<td>The number of investments the MNO has made in other countries of the region until year ( t ).</td>
<td>Regional experience and regional factors</td>
</tr>
<tr>
<td>( REGIONTELE_{kt} )</td>
<td>Presence of a telecom regulatory body in the region that the host country belongs to.</td>
<td>Regional experience and regional factors</td>
</tr>
<tr>
<td>( GDPCAP_{kt} )</td>
<td>GDP per capita (quality of life) in the ( k )th host country at year ( t ).</td>
<td>Other factors</td>
</tr>
<tr>
<td>( FDICAP_{kt} )</td>
<td>Amount of FDI per capita in the host country.</td>
<td></td>
</tr>
<tr>
<td>( MOBILE_{kt} )</td>
<td>Mobile technology adoption (in percentage of the population) in the ( k )th host country.</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Independent variables included in the model of MNO entry.
4. METHODOLOGY

The hypotheses introduced in the previous section are tested using a variety of statistical methods, including the use of descriptive statistics, t-tests and survival analysis. The data set used in the analysis covers the period of 1995—2006 and includes MNO entries in Europe and South America.

The time span for this study was chosen for several reasons. First, many changes in the approach to telecom regulation caused by liberalization and privatization in the sector, such as creation of independent regulatory authorities and adoption of more market-oriented spectrum allocation methods has been occurring during this time period. Second, it is the period when mobile telephony was being actively adopted across the world, which was paralleled by a significant increase in international expansion by MNOs. Finally, some independent variables, including data on the regulative component of institutions, are available from the middle of 1990s.

The two regions were selected because, as the following sections will show, they are similar in some respects while disparate in others, which allows to draw comparisons within and between regions. Europe displays a higher degree of homogeneity on the regulative component of institutional distance, while South America is more homogenous culturally and with respect to methods used to allocate spectrum licenses. Including these two regions also allows to enhance the validity of the results: most countries in South America are classified as developing, while most European countries are developed.

Both the modeling and sources of data are discussed in detail in the following sections.

4.1 Survival analysis

Because internationalization is a process that occurs over time, I use survival analysis to test the effect of independent variables on time until MNO entry into a country. Survival analysis is widely used to model time to events in a variety of applied fields, including medicine, biology, engineering and economics. A common feature of data used in survival analysis is that it may contain censored or truncated observations: some observations are known to have occurred before or after a certain point in time but this point is unknown (censoring), or some observations are excluded from the sample because they do not experience the event of interest before a particular time (truncation) (Klein and Moeschberger, 2003). In this study, this method is robust to the fact that some MNO entries in Europe and South America have occurred or will occur outside the time period under consideration.

I use the semi-parametric Cox proportional hazard model (Cox, 1972). It is semi-parametric in the sense that there is no need to specify the baseline hazard function, which models time to event, while considering the effect of parameters, or independent variables, on the time to event.
The baseline hazard need not be specified to interpret the results as well (Lee, 1992)\(^1\). The Cox model has been used in studies of foreign acquisitions and foreign ownership strategies in international business (Gaur and Lu, 2007; Guillén, 2003; Nadolska and Barkema, 2007), as well as technology diffusion in mobile telecom and patterns of telecom demand (Heitfield and Levy, 2001; Kauffman and Techatassanasoontorn, 2005).

The event under consideration in this study is the entry of an MNO into a country. The hazard function, or the hazard rate, describes the instantaneous probability that MNO entry into the country will occur at a particular time \( t + \Delta t \) given that it has not occurred before time \( t \). The inverse of the hazard rate can be interpreted as the expected time until MNO entry occurs. For example, if a hazard of entry into a particular host country for an MNO is 0.1 (with time measured in years), then MNO entry into this country is expected to occur in 10 (1/0.1) years (Kauffman and Techatassanasoontorn, 2005).

The Cox model estimates the hazard rate for entry into country \( x_i \) in the following form:

\[
h(t|x_i) = h_0(t)e^{\beta x_i},
\]

where \( x_i \) are the independent variables and coefficients \( \beta \) are to be estimated from the data. \( h_0 \) is the baseline hazard function and, as noted before, is left unspecified in the case of the Cox model. However, leaving \( h_0 \) unspecified requires that the ratio of hazard rates of two subjects \( x_i \) and \( x_j \) is constant over time. For example, if it is assumed that the hazard of MNO entry into a country with an independent telecom regulator is twice as high as entry into a country without a regulator, this ratio stays constant over time. This is called the proportional hazard assumption and can be expressed in the following manner:

\[
\frac{h(t|x_i)}{h(t|x_j)} = \frac{h_0(t)e^{\beta x_i}}{h_0(t)e^{\beta x_j}} = e^{\beta x_i-x_j} = \text{const},
\]

provided that the independent variables \( x_i \) and \( x_j \) do not change over time. This allows measuring the effect of \( \beta \) on the hazard rate without specifying the baseline hazard function \( h_0 \). Violation of this assumption can result in biased estimates, which may lead to incorrect inference regarding the impact of independent variables (Box-Steffensmeier and Zorn, 2001).

After the survival model has been estimated, I will check whether the proportional hazard assumption holds by using a test of scaled Schoenfeld residuals suggested by Grambsch and Therneau (2003). It tests the null hypothesis of whether a generalized linear regression of the scaled Schoenfeld residuals of time-dependent variables has a zero slope against functions of

---

\(^1\) This can be compared with parametric models, which explicitly specify the baseline hazard. For example, the parametric Weibull model with monotonously increasing hazard rate may be used in a study of the effect of a treatment on recovery when the treatment is known to have a progressively more powerful healing effect with time. However, choosing a wrong parametric model may lead to estimators of the wrong quantity (Klein, J. P. and Moeschberger, M. L., 2003).
time. If the slope is nonzero (i.e., if the null hypothesis is rejected), the proportional hazards assumption is violated.

It is also important to understand how well the estimated model fits the data. I will test the **goodness of fit** of the model using Cox-Snell residuals (Cox and Snell, 1968). If the Cox proportional hazards model has a good fit with the data, the true cumulative hazard function conditional on the vector of independent variables is distributed exponentially with a hazard rate of $1$ (Cleves et al., 2002). In other words, Cox-Snell residuals should form a straight line at a 45° angle, perhaps with some variability in the right-hand tail, which is expected due to censoring. I will plot the estimated Nelson—Aalen cumulative hazard function against the residuals and assess deviation of the residuals from the true hazard function.

Before estimating the model, a test for **multicollinearity** will be performed. multicollinearity means that two or more independent variables are correlated, and this can lead to large variances of parameters of collinear variables (Kennedy, 2003:206). To test for multicollinearity, pairwise correlation coefficients will be calculated. Values of the coefficients over 0.7 indicate high correlation between two variables (Kennedy, 2003:209). An additional test for multicollinearity will be provided by variance inflation factors (VIFs). VIFs are the main-diagonal elements of the inverted correlation matrix. A suggested rule of thumb is that VIF $>10$ indicates collinearity (Kennedy, 2003:213). If multicollinearity is detected, further checks need to be performed to determine if it should be corrected (for example, by dropping a variable) or can be retained (Kennedy, 2003:210—212).

### 4.2 Data sources

#### 4.2.1 Dependent variable: MNO entry

The dependent variable is the instance of entry of MNOs into foreign countries. It is a binary variable with 0 indicating non-presence and 1 indicating presence of an operator in a country. The year of each entry (i.e., of the first occurrence of 1) is recorded, with values of 1 entered in all subsequent years except in the case of exit, and I record entries as well as non-entries (i.e., countries which an operator did not enter).

Data for operator entry was collected in a two-stage process to ensure reliability. At the first stage, data on operator presence and year of entry was collected from operators’ websites, general and specialized telecom news sources (e.g., BBC News, tele geography.com, etc.) and industry association websites (e.g., GSM Association, CDMA Development Group). At the second stage, these data were verified and expanded using results of consistent search queries on LexisNexis Academic, a news aggregator service that includes data from such sources as Financial Times, Wall Street Journal, Agence France-Presse, The New York Times, AFX News and Business Wire.

The following information about each entry was collected: 1) name of the operator in its home country or name of the operator’s parent or owner company (e.g., France Telecom); 2) home country of the operator; 3) host country where the operator entered; 4) local name in the host...
country (e.g., Orange); 5) year of entry into the host country; 6) year of exit, if any; 7) type of entry: “greenfield” or through an M&A.

The following paragraphs outline the two stages of data collection in more detail.

**First stage.** This stage started with identification of the major international operators in Europe and South America. International or home country websites of these operators were checked to identify the countries in which these operators have presence. Then national websites of each country with the operator’s presence were visited. The “company history” or “company timeline” section was located there, and information on operator entry in the country was entered into the dataset. If the website did not contain information on operator entry, publicly available news sources were searched to obtain that information.

**Second stage.** The information obtained at the first stage was then verified using consistent search queries of historical news articles at LexisNexis Academic. These queries were consistent across the whole dataset in the sense that 1) they were conducted on the same platform, i.e. LexisNexis, and 2) the queries were formulated in a uniform manner: the name of the parent company was searched within a specific distance from the host country name in the text. For example, the query “(France Telecom) W/4 Slovakia” instructs the search engine to search for “France Telecom” within four words from “Slovakia.” The distance was typically set to four words, but in some cases the query did not yield relevant results or yielded too many, and the distance had to be increased or decreased accordingly. In a small number of cases these modified queries still yielded too many results, and the query was reformulated (for example, to include the name of the operator in the host country instead of its name in the home country).

Most entry events were documented in several news sources. Additionally, most searches returned not only information on the entry event itself, but also anticipatory information prior to the entry and information on operator’s activities in the country after the entry. On average, approximately three news articles that documented entry and in some cases post-entry activities were read for each entry event. This was in addition to data from general and telecom news sources, industry associations, as well as operators’ websites, that were collected on the first stage.

This search method may not be adequate for determining prices at which the licenses or shares in operators were acquired, or market shares of operators in each year, because of the potential need to reconcile discrepancies among data sources. However, the granularity of data required for this study is low: only the year of entry or exit are required. Therefore, this method was deemed appropriate for compiling the data set, and validity of data was confirmed by checking data in several sources.

The resulting data set does not attempt to fully describe internationalization of all MNOs within the timeframe and geographical regions. As a result, it may not include every instance of entry for all countries in the timeframe of the study. However, it includes data for 20 large MNOs, and it includes data on all exits, if they occurred, for the instances of entry in the data set. The two-staged process of data collection described above ensured that if an exit occurred for an operator entry included in the data set, it was accounted for. Current operator presence in countries was ensured through collection of data from the operators’ website at the first stage. During
verification of that data at the second stage, information about previous presence of operators in some countries emerged. Once such information was obtained, a new record in the data set was created and details on the presence of the operator in these countries were searched for. For example, as part of verifying entry date of France Télécom into Slovakia, one of the news articles stated that France Télécom had operations in Greece, which was not indicated at France Télécom’s website and therefore not reflected in the data set. Subsequent searches revealed that France Télécom indeed had operations in Greece from 1992 to 1999. Thus, the data set contains accurate information on entrance and exits of operators in the time of the study.

This data set contains information on the **type of entry**: whether an entry occurred through a purchase of a license (and a subsequent building of a network, “greenfield” entry) or through a purchase of a stake in an existing operator. Licenses have often been purchased by consortia of firms, and when several MNOs participated in the same consortium, an instance of entry for each of the operators was recorded.

After an MNO obtained a stake in an operator, **ownership changes** (i.e., increasing or decreasing of a stake in an operator by an MNO) were not recorded unless the MNO completely sold its stake. In that case, exit of the MNO was recorded.

**Ownership structures** were intended to be treated in the following manner. If an MNO had one or two degrees of separation (through ownership) from a company, such ownership was attributed to that MNO. However, in practice this rule did not apply to any firm in the resulting data set. For example, Telecom Argentina, which is partially owned by Telecom Italia, established a subsidiary Núcleo in Paraguay in 1997. If Núcleo further established a subsidiary in another country itself, this subsidiary would not be attributed to Telecom Italia (but would be to Telecom Argentina).

4.2.2 Independent variables

I relied on several sources of data for the independent variables.

The regulative component of the **generic institutional distance** was accounted for by the Regulatory Quality component of the World Governance Indicators. The Regulatory Quality component measures the amount of regulation, burden imposed by excessive regulation as well as the existence of market-unfriendly policies (Kaufmann et al., 2004).

The normative component is accounted for by the amount of cross-border M&A in a country as percentage of GDP. I use M&A data from the United Nations Conference on Trade and Development (UNCTAD) statistics database, which is a major source of these data in empirical studies (Daude and Stein, 2007).

The cognitive component (in effect, cultural distance between two countries) combines data on linguistic and religious affiliation for a particular country. Data on languages spoken in a country was obtained from the Ethnologue database (Gordon, 2005). Data on religious affiliation has been drawn from one of the most comprehensive and widely used compilations of religious affiliations across the globe to date, “L’État des religions dans le monde” (Clévenot, 1987;
Montalvo and Reynal-Querol, 2005). Although this source was compiled two decades ago, I deemed appropriate to use it, as changes in religious affiliations on the national level tend to be slow. The methodology used for constructing cultural distance is described in the following section.

With regard to industry-specific institutional distance, researchers either develop their own measures (Busenitz et al., 2000; Kostova, 1997) and collect data for them or rely on existing data sources (Bénassy-Quéré et al., 2007; Xu, 2001). I chose the latter approach to enhance the generalizability of the results of this study. The regulative component is comprised of two variables: the existence of an independent telecom regulator and the method used for licensing spectrum. Data on the existence of an independent regulator was obtained through websites of national regulators and telecom ministries. Data on licensing method was obtained from country and regional level regulators websites and news sources.

Distances between pairs of countries were calculated from data for individual countries by subtracting the value of a variable for one country from the value for the other and taking the absolute value of the difference. For example, institutional distance for the regulative component between countries $i$ and $j$ are calculated as follows: $INST\_REG_{ij} = |INST\_REG_i - INST\_REG_j|$.

Construction of the industry-specific institutional distance requires some additional explanation since it involves categorical, rather than continuous, variables. Existence of an independent telecom regulator in a country was coded as a binary variable: 0 for absent and 1 for present. Thus, the “distance” between countries on this variable is either 0 (countries are similar: both either have or do not have an independent regulator) or 1 (countries are different: in one country the regulator is present while in the other it is not). Spectrum licensing methods were placed on a continuum from 1 (extension of a previous license, the most bureaucratic-oriented approach), through 2 (first come—first serve), 3 (beauty contest) to 4 (auction, the most market-oriented approach). The distance was then calculated as the difference in spectrum licensing methods.

Data for most other independent variables was obtained from public databases. The sole exception is the number of previous MNO entries in the region, which was constructed using the MNO entry data set. For example, this data set contains data on the years of France Télécom entries in Europe, which allows calculating the number of previous entries for a particular year.

Data for telecom industry characteristics, measured as the number of mobile subscribers per capita, came from the International Telecommunications Union. This source is widely used by researchers and is one of the few sources that contain data on the global scale. It should be noted, however, that its reliability has been questioned by industry experts. The primary concern is the accurateness of the data, which is collected from individual operators who may employ very

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1 Note that although the same set of data is used for both the dependent and one of independent variables, this is not problematic since these two variables capture conceptually different aspects of MNO internationalization. For a given year and given country, the dependent variable is a country-specific binary variable that indicates MNO presence in that country in that year, while previous MNO entries is a region-specific continuous variable that captures MNO entries into countries of the region in the past years.
different methods for estimating the number of their subscribers. This leads to potential problems with, for example, interpreting numbers above 100% of subscribers per capita: does this indicate that some individuals in the country possess more than one mobile phone, or that some subscriptions that are no longer active were counted in? Thus, I use this data source with reservations regarding its accuracy\(^1\).

Data on quality of life, operationalized as GDP per capita, was obtained from the World Economic Outlook Database maintained by the International Monetary Fund and updated semi-annually (International Monetary Fund, 2007).

Data on overall FDI, similarly to data on M&A, was obtained from the UNCTAD database.

Finally, information on the membership in the regional telecom regulator was obtained through websites of the regulators. In Europe the regional telecom regulator is the European Regulators Group (ERG) established in 2002, and in South America it is Regulatel established in 1998.

Independent variables were plotted against the normal curve to check for normality of their distribution. Based on this check for normality, transformations were applied to some variables: logarithmic to FDI per capita (LNFDICAP) and amount of M&A (INST_NORM) and exponential to cultural distance (INST_COGN). The appendix shows distributional graphs of existing and transformed variables.

### 4.2.3 Cultural distance

In this study, cultural distance between countries refers to differences in languages and religions between these countries. The smaller the value of cultural distance, the more similar the countries are.

Cultural distance \(d_{ij}\) was calculated using the following formula:

\[
d_{ij} = \sum_{k \in [L_{ij} \cap R_{ij}]} (w_{ik} - w_{jk}) \cdot w_{jk} \tag{1}
\]

where \(L_{ij}\) is a set of languages common between countries \(i\) and \(j\) (i.e., languages spoken in both of these countries); \(R_{ij}\) is a set of common religions; \(w_{ik}\) is the percentage of speakers of language

\(^1\) While these data may not be a very accurate reflection of the absolute number of subscribers in a country, its biases are more likely to be consistent across years and countries. This makes its use in time-series cross-section research, such as this one, less problematic.
or adherents of religion \( k \) in country \( i \); similarly, \( w_{jk} \) is the percentage of speakers of this language or adherents of this religion in country \( j \).

Smaller values of \( d_{ij} \) indicate greater similarity between the two countries. Additionally, as formula (1) shows, no weighting was applied to language and religion and they were treated with equal significance.

The rationale for formula (1) is as follows. \((w_{ik} - w_{jk})\) is the difference between proportionate speakers of the language in the two countries. It shows how different these countries are (i.e., the largest the value, the more different are the countries). Note, however, that this does not show how significant is this difference.

To understand why significance of the difference is important, consider two scenarios. (They consider only language differences for simplicity.) In the first, country A has 90% speakers of a certain language and country B has 75%. In the second, country A has 20% speakers of the same language and country B has 5%. The relative distances are equal in both cases: \((0.9 - 0.75) = 0.15\) in the first case and \((0.2 - 0.05) = 0.15\) in the second. However, in the first case this distance is more significant than in the second one, because speakers of this language are the majority in both countries.

To incorporate this significance of the distance, the expression \((w_{ik} - w_{jk})\) is multiplied by the smaller of the two percentages of speakers, \(w_{jk}\). This also helps prevent over-inflation of the distance measure in situations when \(w_{ik}\) is very large (close to 1) and \(w_{jk}\) is very small (close to 0).

This methodology can be illustrated with the following example. Again, for simplicity it will only include languages. Consider a sample language data set shown in Table 3.

<table>
<thead>
<tr>
<th>Country</th>
<th>Language1Name</th>
<th>Language1%</th>
<th>Language2Name</th>
<th>Language2%</th>
<th>... (up to 5 languages)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>Dutch</td>
<td>44.65%</td>
<td>French</td>
<td>38.65%</td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>Finnish</td>
<td>92.42%</td>
<td>Swedish</td>
<td>5.62%</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>French</td>
<td>84.40%</td>
<td>Portuguese</td>
<td>1.24%</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Sample data set for calculation of cultural distance.

Let us calculate the distance between Belgium and France. The only common language between them is French (language \( k \)), and there are more (proportionate) speakers of French in France (country \( i \)) than in Belgium (country \( j \)). Therefore, \(w_{France,French} = 0.844\) and \(w_{Belgium,French} = 0.387\). Then, following formula (1),

\[
d_{France,Belgium} = (w_{France,French} - w_{Belgium,French}) \cdot w_{Belgium,French} =
\]

\[
= (0.844 - 0.387) \cdot 0.387 \approx 0.18.
\]
### 4.3 Test of predictive power

After the model is estimated, its predictive power will be tested by splitting the sample and using data for the year 2006, the last year in the data set, for ex post forecasting. A measure of forecasting accuracy proposed by Theil (1958), known as Theil inequality coefficient, will be used. It is formulated as an index of dispersion:

\[ U = \frac{\sqrt{\sum (P_i - A_i)^2}}{\sqrt{\sum P_i^2} + \sqrt{\sum A_i^2}} \]

where \( P_i \) are predictions and \( A_i \) are actual outcomes. It can be thought of as a coefficient that shows deviations of pairs of predicted and actual values, \( P_i \)'s and \( A_i \)'s of a particular variable (Hee, 1966). \( U \) lies in the interval \([0, 1]\), with 0 indicating that predictions are perfect and 1 showing that actual and predicted values are negatively proportional (Ledin, 2001:191—200; Leuthold, 1975).
5. RESULTS

The nature of MNO internationalization and the role that various factors play in this process are examined through a variety of statistical tests described in the following sections. I begin with descriptive statistics that demonstrate the basic properties of many of the variables, which are infrequently reported yet provide a deeper understanding of the nature of the institutional distance construct. This is followed by results of the survival analysis, and hypothesis testing concludes this section.

5.1 Descriptive statistics

The data used for the analysis describes 124 instances of entry of 13 MNOs from 13 home countries into 36 host countries of Europe and South America. I included only one MNO per home country for methodological reasons, to avoid an additional error term from operator-level variables in the model. Table 4 shows entries of these MNOs in Europe and South America, as well as their presence in the rest of the world.

<table>
<thead>
<tr>
<th>Operator</th>
<th>Home country</th>
<th>Entries in Europe</th>
<th>Entries in South America</th>
<th>Presence in the rest of the world</th>
</tr>
</thead>
<tbody>
<tr>
<td>América Móvil</td>
<td>Mexico</td>
<td>0</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Deutsche Telekom</td>
<td>Germany</td>
<td>7</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>France Télécom</td>
<td>France</td>
<td>14</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Hutchinson Whampoa</td>
<td>Hong Kong</td>
<td>8</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>KPN</td>
<td>Netherlands</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Radiolinja</td>
<td>Finland</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TDC</td>
<td>Denmark</td>
<td>10</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Telecom Italia</td>
<td>Italy</td>
<td>4</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Telefónica</td>
<td>Spain</td>
<td>8</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Telekom Austria</td>
<td>Austria</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Telenor</td>
<td>Norway</td>
<td>8</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>TeliaSonera</td>
<td>Sweden</td>
<td>12</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Vodafone</td>
<td>UK</td>
<td>18</td>
<td>0</td>
<td>11</td>
</tr>
</tbody>
</table>

Sources: own calculations and derived from Whalley and Curwen, 2006.

Table 4. MNOs included in the analysis, number of their entries into Europe and South America and presence in the rest of the world.

While retaining only one MNO per home country is to a certain extent a limitation of this study, the data collected for this research indicates that if more than one MNO for each country is considered, this would result in only 16 additional entries by four MNOs: Orange from the United Kingdom (which was bought by France Télécom in 2000), Tele2 from Sweden (which is a virtual MNO in most countries where it operates), Mannesmann from Germany (bought by Vodafone in 2000) and Vivendi Universal from France. Thus, judging by the data at hand, in most countries there appears to exist a “flagship” internationalizing MNO, with other MNOs in the country being much less internationalized. Retaining only one MNO per home country therefore does not significantly limit this study.
As shown in Table 4, of the 13 firms 10 have entered markets not considered in this study and thus have experience in a wide range of contexts. However, the overlap between European and South American activities is relatively low, with only four of the 13 having operations in both regions. This point is further illustrated in Figure 5. For example, América Móvil from Mexico targets almost exclusively South American countries, while Deutsche Telekom has operations throughout Europe but none in South America. Telecom Italia and France Télécom are examples of mobile carriers operating in both regions, with the latter having a substantial number of interests in other parts of the world as well.

5.1.1 Generic and industry-specific institutional distance

To understand patterns of MNO internationalization, it is helpful to gain intuition about the nature and dynamics of the institutional components.

Figure 3. Regulatory quality in countries included in the analysis, 1995—2006. (a) Average regulatory quality, 0 is worst and 5 is best. (b) Percentage change in regulatory quality, 2006 compared to 1995. (Source: calculated from Kaufmann et al., 1996—2007.)
Figure 3 and Figure 4 show the distribution of average values of the regulative and normative components and their change over the time span of the study.

The average values of the regulative component are highly regionalized (Figure 3a). South American countries, with the exception of Chile, dominate the list of the ten countries, while European countries tend to have higher average values on this component. However, the two exceptions are Bulgaria and Romania, which also are among the bottom ten countries and which are to date the most recent entrants to the EU in 2007. The dynamics of the regulative component also exhibits regional patterns (Figure 3b). In almost all South American countries (the exception again being Chile) the regulatory quality decreased in 2006 compared to 1995. On the other hand, regulatory quality in Romania and Bulgaria, which have low average scores, it grew markedly over that period. This also shows the highly dynamic nature of these institutional factors.

![Figure 3](image1)

![Figure 4](image2)

Figure 4. Cross-border mergers and acquisitions as percentage of GDP, 1995—2006. (a) Average M&A. (b) Change in M&A, two-year average of the period end to period start. (Source: UNCTAD, 2008)
The normative component does not exhibit such clear regional patterns as the regulative one, as shown in Figure 4a. Indeed, several South American countries, such as Chile, Bolivia, Argentina and Brazil, have quite high amounts of M&A as percentage of GDP. As shown in Figure 4b, the normative component in almost all countries, both in Europe and South America, has grown (with the sole exception of Bolivia), sometimes quite markedly.

5.1.2 Role of regional experience and regional factors

Figure 5 shows the geographic distribution of MNO entries. This distribution demonstrates the high level of intra-regional investment between the European nations and the lack of such investment in South America.

Notes: 1. Classification of economies as developed and developing follows that of the United Nations. 2. Romania and Bulgaria are classified as economies in transition, however, given their accession to the EU in 2007 I deemed it appropriate to classify them as developed.

Figure 5. Entries of MNOs included in the analysis into European and South American countries.
5.1.3 Institutions and regions

Figure 6 shows the distribution of the components of the generic institutional distance within and between the regions included in the study. As seen in Figure 6, the two regions that were considered in this study have different patterns of similarity and dissimilarity with respect to individual components of institutions: e.g., Europe is relatively homogenous on the regulative component, but heterogeneous on the cognitive one. The degree of similarity between South American countries on these components is different: countries are relatively homogenous on both the regulative and cognitive components.

The role of cognitive distance in MNO internationalization, as shown in Table 8, is significant, and Figure 6 shows large variations in cognitive distance (as indicated by large distance values).
between European countries and small variations between South American ones. However, Table 10 indicates that cognitive distance within and between regions is not significantly different. To check whether MNOs within Europe internationalize into countries with smaller cognitive distance first, I conduct a t-test on the number of previous entries into host countries with cognitive distance below and above the mean. The results are shown in Table 5. They indicate that the average number of previous entries into countries with cognitive distance below the mean is significantly lower than the number of entries into countries with cognitive distance above the mean. In other words, at the time MNOs enter cognitively similar countries, they have less internationalization experience. Thus, entries to cognitively closer countries tend to occur earlier in the MNOs internationalization process.

<table>
<thead>
<tr>
<th>Entries into countries with cognitive distance…</th>
<th>Average number of previous entries</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below the mean</td>
<td>8.337</td>
<td>-3.299***</td>
</tr>
<tr>
<td>Above the mean</td>
<td>9.625</td>
<td></td>
</tr>
</tbody>
</table>

Table 5. Average number of MNO entries from and into European countries with cognitive distance above and below the mean.

Figure 7 shows the licensing methods used in spectrum allocations in Europe and South America. For countries that adopted auctions, the year when an auction was first held is shown. Countries that have used beauty contests display the year of the last beauty contest.

Figure 7. Types of spectrum allocation events in Europe and South America and dates of first occurrences (for Europe, data on 3G allocations only is shown).
Europe shows more variation with respect to the allocation method than South America. Countries of South America, with the exception of Venezuela and Paraguay, have been using auctions, and most of them have adopted auctions before 2000. By contrast, European countries have not overwhelmingly adopted auctions: 11 countries continue to use beauty contests. Furthermore, many of the European countries that adopted auctions have done so after 2000. Thus, there exists a high variation of the spectrum licensing method within Europe and between Europe and South America.

5.2 Statistical results

To ensure theoretical relevance and empirical validity of the results, I first check the data for existence of multicollinearity. Then I proceed to enhancement of the original model and consider whether previous experience has an effect on continuing internationalization of the MNO. Then I estimate several models to identify the best model specification. Finally, I check whether the proportional hazard assumption holds for the best model and assess its goodness of fit. This section presents each step in turn.

5.2.1 Testing for multicollinearity

To check for potential multicollinearity, I calculate pairwise correlations between independent variables and variance inflation factors (VIFs) (see Table 6).

<table>
<thead>
<tr>
<th></th>
<th>LNFDICAP</th>
<th>GDPCAP</th>
<th>MOBILE</th>
<th>INST_REG</th>
<th>INST_NORM</th>
<th>INST_COGN</th>
<th>INST_D_REG</th>
<th>INST_D_LIC</th>
<th>REGIONTELREG</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNFDICAP</td>
<td>0.250***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDPCAP</td>
<td>0.231***</td>
<td>0.637***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOBILE</td>
<td>0.426***</td>
<td>0.523***</td>
<td>0.533***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INST_REG</td>
<td>-0.251***</td>
<td>-0.442***</td>
<td>-0.445***</td>
<td>-0.220***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INST_NORM</td>
<td>0.079***</td>
<td>0.133***</td>
<td>-0.046**</td>
<td>0.020</td>
<td>0.113***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INST_COGN</td>
<td>0.038**</td>
<td>-0.054***</td>
<td>-0.054**</td>
<td>0.013</td>
<td>0.188***</td>
<td>0.165***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INST_D_REG</td>
<td>-0.061**</td>
<td>0.025</td>
<td>-0.088**</td>
<td>-0.262**</td>
<td>-0.102**</td>
<td>0.081</td>
<td>0.033</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INST_D_LIC</td>
<td>-0.075**</td>
<td>-0.076**</td>
<td>-0.069**</td>
<td>-0.069**</td>
<td>0.024</td>
<td>-0.027</td>
<td>0.054**</td>
<td>-0.005</td>
<td></td>
</tr>
<tr>
<td>REGIONTELREG</td>
<td>0.026</td>
<td>-0.069**</td>
<td>-0.043**</td>
<td>0.363**</td>
<td>0.350**</td>
<td>-0.059**</td>
<td>-0.054**</td>
<td>-0.383</td>
<td>-0.064***</td>
</tr>
</tbody>
</table>

VIF 1.296 2.116 2.055 2.422 1.700 1.124 1.089 1.225 1.017 1.751

Significance levels: * p < 0.05; ** p < 0.01; *** p < 0.001

Table 6. Coefficients of pairwise correlations between independent variables and variance inflation factors.

Although many correlations are significant, no pair of variables has a correlation coefficient greater than 0.7 and all variables have VIF < 10. These results indicate that multicollinearity is not an issue (Kennedy, 2003).
5.2.2 Enhancement of the original model

From the internationalization process model it follows that the impact of experience and institutional distance on the firm should decrease with continuing internationalization. To test whether this is the case in the mobile telecom industry, I consider interactions between experience and institutional variables (Cleves et al., 2002:142). To that end, I create four additional variables: the interaction of experience with itself, \( PREVENTR^2 \), and interaction of experience with institutional distance variables: \( INST\_REG \times PREVENTR \), \( INST\_NORM \times PREVENTR \) and \( INST\_COGN \times PREVENTR \).

I then add each of these additional variables in turn to the original model of MNO entry (shown on Figure 2) and calculate the resulting model. If an interaction is significant and a particular variable indeed changes with experience, the additional variable in the model would have a significant effect.

<table>
<thead>
<tr>
<th>Interaction variable</th>
<th>Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>( PREVENTR^2 )</td>
<td>-0.024***</td>
<td>0.000</td>
</tr>
<tr>
<td>( INST_REG \times PREVENTR )</td>
<td>0.078</td>
<td>0.135</td>
</tr>
<tr>
<td>( INST_NORM \times PREVENTR )</td>
<td>-0.006</td>
<td>0.732</td>
</tr>
<tr>
<td>( INST_COGN \times PREVENTR )</td>
<td>0.002</td>
<td>0.979</td>
</tr>
</tbody>
</table>

Table 7. Coefficients and significance levels of interactions between institutional distance variables and experience.

The results of estimation of models with these four variables are shown in Table 7. Only \( PREVENTR^2 \), or the effect of previous experience on itself, is significant and thus this variable will be added to the model.

5.2.3 Results of survival analysis

I estimate three survival models of MNO entry, which are shown in Table 8. Model 1 is the “base” model that was originally proposed to be estimated (see Figure 2). Model 2 includes the additional interaction variable, \( PREVENTR^2 \) (the number of previous investments in the region squared), which was identified as significant in the previous section. A comparison of models 1 and 2 will reveal whether this addition is justified. Model 3 is used to determine whether the addition of an industry-specific institutional measure has significantly improved the original model.

To determine whether a model is significant, I employ the likelihood-ratio (LR) test, which tests whether a particular model is significantly better than an empty model with no covariates. All three models are significant in this sense, as indicated by their LR \( \chi^2 \) statistics.

I also use the LR test to select the best of the three models. All three models are nested: e.g., models 1 and 2 have all the variables that were originally proposed to include in the model, and model 2 additionally includes another variable, \( PREVENTR^2 \). Therefore, the LR test can be used, and the models’ \( \chi^2 \) statistics can be compared (the number of degrees of freedom equals the number of additional variables). The incremental \( \chi^2 \) statistics of the improvement of each model are also shown in Table 8.
## Table 8. Influence of regional, country-level and institutional factors on MNO entry.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>Hazard ratio</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>Hazard ratio</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>Hazard ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREVENTR</td>
<td>0.164</td>
<td>0.029</td>
<td>1.178</td>
<td>0.503</td>
<td>0.091</td>
<td>1.653</td>
<td>0.499</td>
<td>0.089</td>
<td>1.647</td>
</tr>
<tr>
<td>PREVENTR²</td>
<td>-0.024</td>
<td>0.006</td>
<td>0.976</td>
<td>-0.024</td>
<td>0.006</td>
<td>0.976</td>
<td>-0.024</td>
<td>0.006</td>
<td>0.976</td>
</tr>
<tr>
<td>LNFDICAP</td>
<td>0.164</td>
<td>0.134</td>
<td>1.178</td>
<td>0.187</td>
<td>0.135</td>
<td>1.205</td>
<td>0.216</td>
<td>0.135</td>
<td>1.241</td>
</tr>
<tr>
<td>GDPCAP</td>
<td>-3.8e-6</td>
<td>1.51e-5</td>
<td>1.000</td>
<td>-1.06e-5</td>
<td>1.55e-5</td>
<td>1.000</td>
<td>-6.43e-6</td>
<td>1.56e-5</td>
<td>1.000</td>
</tr>
<tr>
<td>MOBILE</td>
<td>-0.005</td>
<td>0.009</td>
<td>0.995</td>
<td>-0.002</td>
<td>0.009</td>
<td>0.998</td>
<td>-0.006</td>
<td>0.009</td>
<td>0.994</td>
</tr>
<tr>
<td>INST REG</td>
<td>0.002</td>
<td>0.297</td>
<td>1.002</td>
<td>0.016</td>
<td>0.298</td>
<td>1.016</td>
<td>-0.028</td>
<td>0.297</td>
<td>0.973</td>
</tr>
<tr>
<td>INST NORM</td>
<td>0.236</td>
<td>0.099</td>
<td>1.266</td>
<td>0.226</td>
<td>0.099</td>
<td>1.253</td>
<td>0.216</td>
<td>0.098</td>
<td>1.241</td>
</tr>
<tr>
<td>INST COGN</td>
<td>-1.061</td>
<td>0.317</td>
<td>0.346</td>
<td>-1.049</td>
<td>0.316</td>
<td>0.350</td>
<td>-1.001</td>
<td>0.310</td>
<td>0.367</td>
</tr>
<tr>
<td>INST D REG</td>
<td>-0.529</td>
<td>0.254</td>
<td>0.589</td>
<td>-0.564</td>
<td>0.255</td>
<td>0.569</td>
<td>-0.564</td>
<td>0.255</td>
<td>0.569</td>
</tr>
<tr>
<td>INST D LIC</td>
<td>-0.462</td>
<td>0.202</td>
<td>0.630</td>
<td>-0.441</td>
<td>0.203</td>
<td>0.643</td>
<td>-0.441</td>
<td>0.203</td>
<td>0.643</td>
</tr>
<tr>
<td>REGIONTELREG</td>
<td>0.068</td>
<td>0.429</td>
<td>1.070</td>
<td>0.019</td>
<td>0.433</td>
<td>1.020</td>
<td>0.166</td>
<td>0.431</td>
<td>1.180</td>
</tr>
</tbody>
</table>

Note: 1) Incremental $\chi^2$ is shown in comparison with a particular model, which is indicated. E.g., “vs. M2” means “in comparison with Model 2.” 2) BIC = Bayesian Information Criterion, which will be used later during robustness check to compare non-nested models. 3) GDPCAP was tested using both unadjusted US dollars and dollars adjusted for purchasing power parity, with no significant difference in results. The table shows results for unadjusted dollars.

Model 2, which is the base model with an additional variable PREVENTR², is selected as the best model. It shows a significant improvement from both model 1 (the base model) and model 3, which does not include industry-specific institutional distance.

### 5.2.4 Testing the proportional hazard assumption and goodness of fit

Whether the proportional hazard assumption holds with regard to model 2 was checked using the test of scaled Schoenfeld residuals of time-dependent independent variables (Grambsch and Therneau, 2003). It tests the null hypothesis that the slope of generalized linear regression of scaled Schoenfeld residuals has a zero slope (Grambsch and Therneau, 2003), and rejection of the null hypothesis means that the proportional hazard assumption does not hold. The results of the test are shown in Table 9.

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\rho$</th>
<th>$\chi^2$</th>
<th>$p$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREVENTR</td>
<td>-0.166</td>
<td>2.07</td>
<td>0.150</td>
</tr>
<tr>
<td>LNFDICAP</td>
<td>-0.024</td>
<td>0.06</td>
<td>0.811</td>
</tr>
<tr>
<td>GDPCAP</td>
<td>0.094</td>
<td>0.69</td>
<td>0.406</td>
</tr>
<tr>
<td>MOBILE</td>
<td>-0.117</td>
<td>1.68</td>
<td>0.194</td>
</tr>
<tr>
<td>INST REG</td>
<td>0.063</td>
<td>0.39</td>
<td>0.535</td>
</tr>
<tr>
<td>INST NORM</td>
<td>0.130</td>
<td>1.42</td>
<td>0.234</td>
</tr>
<tr>
<td>INST COGN</td>
<td>-0.147</td>
<td>2.18</td>
<td>0.140</td>
</tr>
<tr>
<td>INST D REG</td>
<td>-0.015</td>
<td>0.02</td>
<td>0.894</td>
</tr>
<tr>
<td>INST D LIC</td>
<td>0.138</td>
<td>1.63</td>
<td>0.201</td>
</tr>
<tr>
<td>REGIONTELREG</td>
<td>-0.092</td>
<td>0.66</td>
<td>0.416</td>
</tr>
</tbody>
</table>

Table 9. Results of the test of proportional hazards assumption.
Because the test results for all variables have an insignificant \( p \)-value, there is not enough evidence to reject the null hypothesis. Thus, the proportional hazard assumption is not violated.

I test the goodness of fit of the model using Cox-Snell residuals (Cox and Snell, 1968). Cox-Snell residuals should form a straight line at a 45° angle, perhaps with certain variability in the right-hand tail. Figure 8 shows the estimated empirical Nelson—Aalen cumulative hazard function plotted against the residuals.

![Figure 8. Cumulative hazard of Cox-Snell residuals for assessment of the goodness of fit.](image)

Although there is some variability in the right tail, overall the pattern of Cox-Snell residuals demonstrate an adequate fit of the model to the data (Cleves et al., 2002).

### 5.2.5 Test of predictive power

To answer RQ1a, in addition to performing the analysis of fit of the model, I performed a test of its predictive power. I did this by splitting the sample, calculating the predicted value of the hazard ratio for the year 2006, the last year in the sample, and comparing the predicted values to actual values. The comparison was performed with Theil inequality coefficient (Theil, 1958).

The value of Theil coefficient was \( U = 0.063 \). This indicates that the difference between predicted and actual outcomes is small, and thus the model possesses a satisfactory predictive power (Frey and Schneider, 1981; Ledin, 2001:191—200; Weise, Bachtler et al., 2001).

### 5.3 Hypothesis testing

Model 2 was selected as the best model, and I use it to test the hypotheses of this study. The following sections describe hypothesis testing with respect to major constructs of the study.
Hypothesis 1a regarding the effect of **generic institutional distance** is partially supported. Of the three components of institutional distance (regulative, normative, and cognitive), two are significant. Regulative institutional distance between the home and host countries of the MNO (\( \text{INST}_{\text{REG}} \)) is not significant in the model. Conversely, the normative and cognitive components of institutional distance are significant. However, the effect of the normative component (\( \text{INST}_{\text{NORM}} \)) is the opposite of that hypothesized: while hypothesis 4a predicts that a smaller distance between the home and potential host countries facilitates entry, the results indicate that a larger normative distance is more likely to lead to entry. More specifically, an increase in the normative distance between the home and host countries by 10% increases the hazard rate by 2.3% (\([1 – \exp(0.0226)] \times 100\%\)). For example, in 2001 the normative distance between Austria and Switzerland was approximately 10% higher than between Austria and Sweden. This indicates that an MNO from Austria has a 2.3% higher hazard of entering Switzerland than Sweden in that year. With regard to the cognitive component (\( \text{INST}_{\text{COGN}} \)), hypothesis 4a is supported: smaller cognitive distance leads to an increased likelihood of entry, and an increase in the cognitive distance of 10% decreases the hazard rate by 10% (\([1 – \exp(-0.1049)] \times 100\%\)). For example, cognitive distance between Austria and Estonia is approximately 10% higher than between Austria and the Netherlands. Therefore, the hazard of an Austrian MNO entering Estonia is 10% lower than entering the Netherlands.

The hazard ratios of the variables that represent interactions between components of institutional distance and experience (e.g., \( \text{INST}_{\text{REG}} \times \text{PREVENTR} \)) are insignificant. Experience thus does not have an effect on how institutional distance influences entry: in other words, institutional distance has a constant (with respect to experience) and significant effect on entry.

Hypothesis 1b that tests the influence of **industry-specific institutional distance** is fully supported: entry of the MNO is more likely to occur into a country with the smaller industry-specific institutional distance. This is confirmed by both components of industry-specific distance, \( \text{INST}_{\text{D}_\text{REG}} \) and \( \text{INST}_{\text{D}_\text{LIC}} \), that were included in the model. Similarity on the independent regulator variable, \( \text{INST}_{\text{D}_\text{REG}} \) (either it exists in both the home and the host country or does not exist in both) increases the hazard rate by 43% (\([1 – 0.569] \times 100\%\)). A one-unit increase in the similarity of the licensing method, \( \text{INST}_{\text{D}_\text{LIC}} \), increases the hazard by 35.7% (\([1 – 0.643] \times 100\%\)).

Furthermore, a comparison of models 2 and 3 gives support to hypothesis 1c regarding the effect of adding the industry-specific institutional distance in the model. Model 3 is identical to model 2 except that it does not contain industry-specific institutional distance. LR test of the \( \chi^2 \) statistics of the two models yields a significant result, indicating that model 2 is significantly better than model 3.

5.3.2 Role of regional experience and regional factors

Hypothesis 2a, which tests the effect of previous investments on MNO entry, is supported. MNO experience in the region, or the number of previous investments, exhibits an inverted U-shaped relationship with entry into another country of the same region, as indicated by the significant
positive effect of the linear term, \( \text{PREVENTR} (p < 0.001) \), and the significant negative effect of the quadratic term, \( \text{PREVENTR}^2 (p < 0.001) \). In other words, the hazard rate first increases and then decreases with more experience (see Figure 9).

![Figure 9. Schematic relationship between MNO regional experience (number of entries) and the hazard rate.](image)

The results indicate that the hazard rate due to regional experience reaches its maximum at 10 \((0.5025/(2 \times 0.0244) = 10.29)\) previous entries in the region. As seen in Table 4, four MNOs have 10 or more entries in Europe: France Télécom, TDC, TeliaSonera and Vodafone, and each of them have operations outside the region. Furthermore, if the effect of all other variables was not taken into account, the number of previous entries in the region would dramatically increase the hazard rate, and this effect would be more pronounced at the early stages of internationalization: an entry into the first foreign country would increase the hazard rate of entry by 48%; an entry into the second country would further increase the hazard rate by 43%, etc. until the hazard rate starts to decrease with the eleventh entry. However, each subsequent entry also changes values of other variables, and the overall effect of all variables on the hazard rate will be different than described (e.g., consistent with the internationalization process model, it can be expected that subsequent entries occur into countries with higher institutional distance, thus changing values of the institutional distance variables with each entry).

I found no support for hypothesis 2b regarding the influence of a regional-level telecom authority \( \text{REGIONTELE} \) on MNO entry. This lack of effect of a regional authority was also indicated by industry experts.

5.3.3 Institutions and regions

Hypotheses 2c and 2d test the average of the generic and industry-specific distances within and between regions. They are tested using a t-test on average distances between pairs of countries within the same region (e.g., Europe) and in two different regions (Europe and South America). The results of the t-test are shown in Table 10.

Hypothesis 2c regarding generic institutions is partially supported: the regulative component of institutions is on average smaller between countries within the same region than between countries from different regions. The average distances of the normative and cognitive components between countries within the same region and from different regions are not significant.
### Institutional distance component

<table>
<thead>
<tr>
<th>Institutional distance component</th>
<th>Mean value</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INST_REG</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within region</td>
<td>0.519</td>
<td>15.426***</td>
</tr>
<tr>
<td>Between regions</td>
<td>1.061</td>
<td></td>
</tr>
<tr>
<td><strong>INST_NORM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within region</td>
<td>0.019</td>
<td>1.498</td>
</tr>
<tr>
<td>Between regions</td>
<td>0.021</td>
<td></td>
</tr>
<tr>
<td><strong>INST_COGN</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within region</td>
<td>0.571</td>
<td>-1.003</td>
</tr>
<tr>
<td>Between regions</td>
<td>0.542</td>
<td></td>
</tr>
<tr>
<td><strong>INST_D_COMP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within region</td>
<td>0.255</td>
<td>0.861</td>
</tr>
<tr>
<td>Between regions</td>
<td>0.271</td>
<td></td>
</tr>
<tr>
<td><strong>INST_D_LIC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within region</td>
<td>0.516</td>
<td>-0.140</td>
</tr>
<tr>
<td>Between regions</td>
<td>0.515</td>
<td></td>
</tr>
</tbody>
</table>

*Note: p < 0.001.*

Table 10. T-test of averages of institutional distance components within and between regions.

Hypothesis 2d, which tests **industry-specific institutions**, is not supported. There is no significant difference between countries in the same region and in different regions on both the existence of an independent regulator and the licensing method.

#### 5.3.4 Influence of other factors on MNO entry

I found no support for hypotheses 3a, 3b and 3c. This is indicated by the statistically insignificant hazard ratios of the variables that describe the level of **technology adoption (MOBILE)**, the amount of **FDI per capita (LNFDICAP)** and **quality of life (GDPCAP)**. The quality of life was tested using GDP per capita in both unadjusted US dollars and adjusted for purchasing-power parity, with no significant difference in the results (Table 8 shows results for unadjusted dollars).

#### 5.4 Robustness checks

I performed three robustness checks of the results obtained from model 2, which was selected as the best model. In these tests, I used an alternative operationalization of the regulative and normative components of generic institutional distance; estimated model 2 with lagged variables and used the rate of change in fixed telecom lines instead of mobile adoption data for the telecom industry characteristics variable. The results indicate that model 2 is robust across different operationalizations of the regulative and normative components of institutional distance; that the model with non-lagged data is preferable to that with lagged data and that the rate of change in fixed telecom does not make the telecom industry characteristics variable significant.

Model 2 and the models estimated in this section are not nested: they all have the same set of variables, but differ in the data used for operationalizing this variables. Therefore, LR test cannot be used to compare the models. Instead, I use the difference in models’ Bayesian Information Criterion, BIC (Schwarz, 1978) for comparison. A difference in BICs greater than 10 indicates strong evidence towards selecting the model with the smaller BIC (Raftery, 1995). Furthermore,
because BIC is calculated based on the size of the sample, I adjust the size of sample used to calculate model 2 according to the sample size of each of the following models.

The alternative operationalization of the *regulative and normative components* of generic institutional distance was taken from the Global Competitiveness Report (World Economic Forum, 2006), which consists of several meta-components of competitiveness of countries. Although the Report is a valid choice for cross-section analysis, it is harder to use for time-series analysis, since its structure is not stable over time: some editions do not contain measures that are present in others.

The results of estimation indicate that the difference of BICs between this model and model 2 is 1.56, suggesting that there is no significant difference between this model and model 2. This indicates that model 2 is robust with the alternative operationalization of the regulative and normative components of generic institutional distance. Additionally, the normative component of institutional distance is not significant with this operationalization.

To check for the potential *lagged effect* of independent variables on MNO entry, I introduced a one-year lag for all variables except for the cognitive component of generic institutional distance, which is constant over time. The difference between BICs of this model and model 2 is 22.34, with BIC of model 2 being the smallest. Therefore, model 2 shows a significant improvement over the model with lagged variables.

I also used an alternative operationalization of the telecom industry characteristics variable, namely the rate of change in fixed telecom lines adoption in the target country. The p-value of this operationalization was 0.139, indicating a lack of significance. Furthermore, the $\chi^2$ value of the model decreased to 82.98. Therefore the mobile data operationalization was retained.
6. DISCUSSION

This study has performed a systematic analysis of factors influencing MNO entry and assessed their relative importance, including a more nuanced understanding of the regional factor. In summary, this research draws the following conclusions. First, institutional distance between the home and the host countries, as well as MNO internationalization experience in the region, play a significant role in MNO entry. Conversely, characteristics of the host country do not play a significant role. Second, the effect of institutional distance does not change as the MNO gains more experience in internationalization, while the effect of regional experience decreases with more experience. Third, the industry-specific regulative component of institutional distance is a more significant predictor of entry than the generic regulative component, at least in the regulated mobile telecom industry.

This research makes several important theoretical advances and contributions to practice. From the theoretical perspective, it compares several theories and frameworks of explaining internationalization, compares the relative importance of generic and industry-specific institutional distance and performs a systematic evaluation of factors that influence MNO internationalization. From the practical standpoint, this research may assist in development and enhancement of FDI strategies by policymakers and internationalization strategies by MNOs.

The rest of this section provides a more detailed discussion of the results with regard to four general topics: 1) the importance of industry-specific factors in institutional distance, 2) the role of regional factors and regional experience in MNO internationalization, 3) the relative significance of institutional distance and the regional dimension in MNO internationalization and 4) influence of other factors on internationalization. This section discusses each finding in turn, summarizes the discussion through a revised model and reviews theoretical and practical contributions of this study.

6.1 Generic and industry-specific institutional distance

Currently, two approaches to institutional distance exist. The first approach considers institutional distance to be a generic construct not anchored in any particular context (Linders et al., 2005; Xu and Shenkar, 2002), while the second one considers institutional distance to be specific to a particular domain (Busenitz et al., 2000; Kostova, 1997). This study introduced the notion of a hybrid institutional distance, which combines the generic and industry-specific distance measures, and was able to test it for the regulative component.

A hybrid approach is based on the contention from the institutional theory that institutions are a multi-level and multi-faceted construct. The use of a hybrid approach may have the following implications and conditions. On the one hand, this approach allows to include more levels of analysis in the operationalization of institutional distance: while the generic measure operates at higher levels, such as national, the industry-specific one allows considering characteristics of a particular industry or organizational field. Combining the two measures into a hybrid one thus produces a more nuanced picture of the role of institutions. On the other hand, however, using a fully hybrid approach is neither always possible (e.g., for data availability reasons) nor always...
significantly beneficial. Researchers should evaluate the tradeoff between the costs of obtaining data for all components of a hybrid measure and the contribution that each component makes. If it can be expected that particular components are more significant, obtaining data for these components for either the generic or industry-specific measure only may suffice. For example, in the context of the highly regulated mobile industry used in this research, the industry-specific regulative component was expected to be more significant than industry-specific normative or cognitive components. Taking into consideration data availability issues, only the regulative component of the industry-specific measure was operationalized.

6.1.1 Regulative component

Overall, a significant relationship was found between institutional distance and MNO entry. With regard to generic institutional distance, the effect of the regulative component was not significant, and only normative and cognitive components were found to have a significant influence on MNO entry. This disparity in the effect of the components of generic institutional distance is in line with the theoretical separation of the three components of institutions. It also provides further support to empirical research that separates these three components (Busenitz et al., 2000).

Further research is required on the applicability of both the generic and industry-specific institutional distance measures. One differentiator of applicability may be the amount of regulation in a particular industry. In this study, the general regulatory environment of a country does not influence MNO entry. This is counterweighted by the significant and negative effect of the industry-specific institutional distance measures. In other words, entry is more likely to occur into host countries with small differences in mobile telecom-specific regulations. This is in line with the position of some institutional distance scholars (e.g., Busenitz et al., 2000; Kostova, 1997), who advocate the use of an industry-specific measure in internationalization studies. However, it may also indicate a need for a more nuanced approach to the role of regulation in firm internationalization. Of particular interest is the importance of similarities between countries in their general regulatory environments where entry in regulated industries is concerned. Mobile telecom is an example of such an industry, and the quality (including transparency and predictability) and the burden of regulation specific to the mobile industry may be of higher importance to MNOs than the quality of overall regulation. A similar effect may be found in the broader field of telecom, particularly in fixed, and in other regulated industries, such as life sciences. Conversely, the quality of generic regulative distance may be a significant determinant of entry in lightly or unregulated industries. Further research is required to better understand the role of generic and industry-specific regulative distance in industries with varying amounts of regulation.

It is also important to note that policies change and therefore the industry-specific institutional distance varies over time and across levels of analysis, which may require revisiting its operationalization in future studies. With regard to changes over time, the existence of an independent regulator displayed a significant variance during the timeframe of the study: in 1995 only seven countries had an independent regulator, and in 2006 35 did. Studies in other timeframes may not find a similar variance. Licensing of mobile spectrum may persist for
technological reasons, however future allocations may converge on a single allocation method (e.g., auction). Thus, future studies may need to reassess the relevance of various aspects of mobile regulations, which may include the normative and cognitive components in addition to the regulative one.

Furthermore, the results of this study indicate that the influence of industry-specific institutional distance varies across regional and national levels of analysis. In contrast with national-level institutions, the presence of a regional telecom regulator was found to be insignificant. One reason for this may be that the regional regulator usually has less influence on policies regarding MNO entry and conditions of operation than the national-level regulator (Maitland and van Gorp, 2007). Therefore MNOs do not consider the presence of a regional telecom regulator in their entry strategy. Furthermore, the existence of regional regulators is a relatively new phenomenon: in Europe and South America, they first appeared in 1998 and hence their influence may develop over time.

Thus, the use of the hybrid approach to the regulative component of institutional distance highlighted important differences in the role of generic and industry-specific regulation. However, because only the regulative component was considered in this hybrid approach, further research is needed to determine whether industry-specific measures are more usable for the normative and cognitive components as well. This study is the first of its kind to mix industry-specific and generic distance measures, and the mixed results, with industry-specific regulative and generic normative and cognitive distances being significant, suggest that such hybrid approaches, rather than exclusively generic or exclusively industry-specific ones, may yield better results and more nuanced understanding of market entry phenomena.

6.1.2 Normative component

The normative component was found to have a significant and positive effect on internationalization: MNOs are more likely to enter host countries with a different structure of business norms and values than that of their home country. This may be in line with research on cross-border M&A that suggests that firms are more likely to acquire target companies in countries with lower levels of corporate governance and improve corporate governance in the target to their standards, thus contributing to a global convergence in corporate governance (Coffee, 1999; Rossi and Volpin, 2006). However, the underlying data only indicates the absolute difference between M&A levels of the home and host country and does not indicate the direction of the difference (i.e., it indicates that countries A and B are different but does not indicate which country, A or B, has higher levels of M&A). Thus MNOs, being part of the significantly international mobile telecom industry, may contribute to the global convergence of corporate norms and practices. This may demonstrate that the benefits international MNOs bring into host countries are multifaceted: in addition to improving or in some cases creating telecom infrastructure, they also may enhance the business culture of the country.

Given these benefits for the host country, what are the benefits for the MNO itself of entering a country with larger normative distance? One explanation may be that mobile telecom firms have a particular diversification and international learning strategy that does not prioritize the
normative component. Both the regulative and cognitive components may significantly affect
MNO operations: the regulative by the possibility of regulatory action and the cognitive by the
risk of marketing failure (de Mooij, 2004). On the other hand, Scott (2001:56) indicates that the
strength of the normative component varies with context, and in a study by Ionaşcu et al. (2004)
normative distance was found to not have a significant effect on the mode of foreign entry. Thus,
of the three components of institutions the normative one may have the least significant impact
on MNO entry: to recall, a 10% change in the normative component changes the hazard of entry
by only 2.3%. By contrast, a 10% change in the cognitive component changes the hazard of entry
by 10%. Therefore MNOs may pursue an internationalization and diversification strategy that
emphasizes entry into more distant countries with regard to the normative component: it allows
MNOs to learn and obtain new experience without exposing them to a regulative or cognitive
threat.

Further research, therefore, is required to more precisely identify the benefits that MNOs obtain
from entering countries with higher normative distance.

6.1.3 Cognitive component

The relationship between MNO entry and cognitive distance is significant and negative: entry is
more likely to occur into host countries that are culturally closer to the MNO’s home country.
This finding is in line with previous studies that found a significant relationship between smaller
cultural distance and firm entry. The significance of cognitive distance may indicate the strategic
importance of national culture to MNOs. This gives further empirical support to previous studies
that stress the importance of MNO marketing strategy to its success, particularly in saturated
markets (Kim et al., 2004). It also may indicate that a strategy based on smaller cultural distance
is more important in internationalization than a regional strategy. In regions with small cognitive
distance between the countries (such as South America — see Figure 6c) pursuing a purely
regional strategy is justified. However, when cognitive distances within the region are large
(such as in Europe), a combination of a regional and a cognitive distance-based approach may be
used by the MNO. An example is Telefónica from Spain, which is active in both Europe and
South America, and Spain has a low cognitive distance with South American countries.

6.2 Role of regional experience and regional factors

The results of this study indicate that MNOs start their foreign expansion activities in their own
region, and with gained experience they move beyond the region. This is in line with Johansson
and Vahlne’s (1977) argument on the role of increased experience leading to internationalization
to more distant countries. However, as shown in Figure 6, regions are not always homogenous
between their member countries from the point of view of institutional distance. Thus there is an
apparent contradiction: on one hand, MNOs first internationalize into countries of their own
region; on the other hand, countries of the same region may be very dissimilar. This
contradiction can be explained by that even within a heterogeneous region there are “sub-
regions,” or clusters of countries with smaller distances between them than the average distance
between countries in the region. This is confirmed by results in Table 5: MNOs with fewer past
entries tend to enter countries with smaller cognitive distance. For example, France Télécom entered Belgium in 1995 and the Netherlands in 1998, and cognitive distance between France and Belgium is 70% smaller than between France and the Netherlands.

The finding that regional experience matters is an important theoretical contribution that lends partial support to the results of scholars in the regionalization tradition (Dunning et al., 2007; Rugman and Verbeke, 2007; Rugman and Brain, 2003). This tradition sees multinational companies as operating primarily within the confines of a particular region (the extent to which this is an outcome of a particular strategy or is caused by changes in the world economy is a matter of some debate) and rarely pursuing a truly global strategy. However, unlike some studies that follow the regionalization logic, this research further advances our understanding of the regionalization phenomenon by including the time component. Because most previous studies did not explicitly account for time, they assumed what is essentially a static strategy of regionalization. This approach is limited in the sense that it does not explain firm behavior after it attained a particular level of internationalization in the region (e.g., when it expanded into most countries of the region).

Results of this study fill this important gap, which stems from not including the time component. It follows from the results that previous experience in the region and MNO entry have an inverse U-shaped relationship. In other words, there are diminishing returns to experience: experience in the region, up until a certain level, has a positive effect on MNO entry into a country of the region. After this level of experience has been reached, further experience does not significantly affect the probability of MNO entry in the countries of the region1.

By way of comparison, the results of this study also empirically confirm that firms in the mobile telecom industry do not exhibit properties of born-global firms (Knight and Cavusgil, 1996). If this was the case, regional experience would not have a significant relationship with MNO entry. Instead, at least with the dataset used for this study, MNOs first tend to internationalize within a particular region before expanding beyond the region. This bears important theoretical implications: unlike born-global firms, MNOs after their creation are oriented predominantly on the domestic market, where most of their resources are allocated and most of their revenue comes from (compare that with properties of born-globals as described by Knight and Cavusgil (1996)). However, as noted above, mobile telecom is an internationalized industry. This research shows therefore that higher degrees internationalization of a firm and of the industry do not have to be associated with the born-global phenomenon.

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1 This result may also be explained by that when this inflection point of experience has been reached, there are few countries in the region left to enter. In other words, by the time of this inflection the MNO has expanded into most countries of the region and has no other choice but internationalize outside of the region. However, my results indicate that the level of experience where inflection occurs is 10 entries in the region. This is significantly fewer than 26 countries that were considered in Europe. Furthermore, no operator has a European-wide presence (Vodafone has the highest number of entries in the region, 18, not considering its partnership agreements). Although this experience level is the same as the number of countries in South America, América Móvil and Telefónica, MNOs with the largest number of entries, both have only eight. Thus, this explanation may be partial at best.
Thus MNO internationalization strategies may exploit the opportunities presented by the fact that regions are homogenous on some components of institutions (such as regulative) but are heterogeneous on the others (such as cognitive). Future research may test whether these findings hold in a wider geographical context and if so, whether MNOs systematically exploit these opportunities of regional heterogeneity.

6.3 Institutions and regions

My results indicate that the role of institutional distance in internationalization does not change as the MNO becomes more internationalized. This finding is in contrast with the diminishing returns to experience itself, which were discussed above. The effect of MNO regional experience on entry thus declines as the MNO internationalizes within the region, while the institutional distance is a constant driver of internationalization. These diminishing returns to experience support the empirical findings of Davidson (1980). Indeed, it can be expected that host countries that are closest to the MNO’s home country institutionally will be located within the MNO’s home region. The MNO then continues to internationalize into institutionally more distant countries, which after a certain threshold of distance may also be located beyond MNO’s home region. Furthermore, although the effect of individual components of institutional distance is different, the extent to which all components influence internationalization does not change with added experience.

These results also allow to build a bridge between the three major theoretical approaches used in this study: the internationalization process model, institutional distance approach and the regionalization approach. Diminishing returns to experience indicate that MNOs follow the learning curve suggested by the internationalization process model. Furthermore, regional experience is shown to have a more significant impact on MNO entry at the early stages of internationalization, and thus the regionalization approach is more useful for explaining MNO internationalization at the beginning of the internationalization process. By contrast, the institutional distance approach is more applicable for explaining internationalization at later stages, since the effect of institutional distance on entry does not change with experience.

This empirical investigation of change in the role of experience and institutional distance with increased internationalization makes an important contribution to existing research. While the diminishing effects of experience were found shortly after formulation of the original internationalization process model (Davidson, 1980), little research has been undertaken on the effect of experience on institutional distance. In addition to the effect of institutional distance on entry with increasing experience addressed in this research, other research questions that can be explored include the implications of the dynamic nature of institutions for firm experience and the generalizability of the results of this research across industries.

6.4 Influence of other factors on MNO entry

The discussion so far focused on the generic and industry-specific institutional distances and the role of MNO experience in the region. I now turn attention to the role of other factors that were
tested with regard to MNO internationalization: characteristics of the telecom industry, host
country characteristics and regional telecom policy harmonization.

**Telecom industry characteristics** in the host country (the number of mobile subscribers) were
found, rather surprisingly, not to have a significant effect on MNO internationalization. Although
little systematic evaluation of internationalization in mobile telecom has been done to date, this
finding is in contrast with what has been observed in studies of fixed telecom, where competitive
advantages were found to accrue to early movers (Sarkar et al., 1999), and in studies of telecom
operator performance due to internationalization, which found the level of technology adoption
to significantly affect operator performance (Rieck et al., 2004). Therefore, while this result may
not be generalizable to other industry contexts, it also casts doubt on the unconditional
applicability of findings from fixed telecom to the mobile telecom domain. This finding may be
due to at least two factors: mode of entry, which this study has not accounted for, and quality of
data. MNOs may be more influenced by characteristics of the industry when they make a
greenfield entry by acquiring a license and rolling out a new network than when entering through
a merger or acquisition of an existing operator. Because this study did not control for the mode
of entry, this is an area of potential future research. This result also may be due to a problem with
underlying data used for operationalizing of this factor (see more on that in section 4.2.2).

The effect of overall FDI was also found not to have a significant effect on internationalization
as well. This is likely due to the regulated nature of mobile telecom, which sets MNO entry apart
from FDI in other industries. Indeed, MNO entry in many cases is subject to regulatory approval,
and in the case of greenfield investment, to a licensing process. As seen from results regarding
the regulatory component of institutional distance, a country’s regulations specific to the mobile
telecom industry are a significant factor in MNO entry, while generic regulations are not.
Therefore overall favorable FDI conditions in a country may have little effect on investments in
mobile telecom. This finding is in contrast with research on the general patterns of FDI, which
was shown to have a reinforcing effect on itself (Cheng and Kwan, 2000; Dunning et al., 2007).
Thus, while this reinforcing effect may hold in the general case of FDI, important caveats may
exist in regulated industries. Such differing effects of generic and industry-specific regulatory
and investment policies on entry in industries with varying degrees of regulation, and the
consequent generalizability of findings, constitute a potentially extremely rich area of future
research considering the importance and variety of regulated industries, which include such
diverse sectors as financial, commercial airlines and electricity.

Finally, **quality of life** (measured here as GDP per capita) was found to not affect MNO
internationalization behavior. It was hypothesized that higher income levels associated with a
higher quality of life may lead to higher demand for mobile services. This hypothesis was based
on a rich tradition of adoption of information and communication technologies (ICTs), such as
fixed telephony (Wallsten, 2001), computer use and internet (Chinn and Fairlie, 2006; Shih et al.,
2008). However, empirical evidence suggests that mobile technology adoption follows an S-
curve that is similar across countries irrespective of the level of their quality of life, although in
countries with lower quality of life adoption is slower to take off (Kauffman and
Techatassanasoontorn, 2005). Furthermore, the speed at which new technologies disseminate
from early to late adopters has been increasing dramatically with each new technology (Comin
and Hobijn, 2004), and the adoption of mobile technology has been the fastest of all technologies
to date (World Bank, 2008). This has been attributed to many factors, among them favorable
fiscal environments (such as low inflation) and more hospitable technical and regulatory environments, all of which enhance private sector engagement in financing of new technology. This, in turn, has shifted much of the burden of financing and building the infrastructure for new technologies, including mobile telecom, from governments to private companies (World Bank, 2008). Mobile technology is thus an oft-cited example of leapfrogging. In some countries the adoption of fixed telephone lines has been negligible, while mobile technology being adopted by much larger share of the population: for example, in Mozambique only 0.33% of population has a fixed telephone line, which is a stark contrast with 11.6% that have a mobile telephone (International Telecommunications Union, 2007). Future research may investigate the extent to which these findings are generalizable. In other words, future studies may examine whether mobile technology is a true outlier among ICTs based on the quality of life or these results are due, for example, to convergence in technology diffusion patterns among developing and developed countries.

Having considered the influence of the region, institutional distance and other factors, it can be asked whether there are alternative explanations of MNO internationalization behavior. One such explanation can be the role of past internationalization of the parent fixed company. Indeed, many companies in the sample have fixed-line units (e.g., Deutsche Telekom, France Télécom, Telefónica, Telecom Italia), which may have internationalized before the mobile units did. Mobile units might thus simply followed internationalization patterns of the fixed units. However, the fixed industry is more regulated and much less internationalized than mobile (Sarkar et al., 1999). Since industry-specific institutional distance was found to be a significant factor in MNO internationalization, it may be expected to be of even higher significance in the more regulated fixed industry. Fixed telecom also experienced less internationalization, which occurred at a time when telecom was considered a natural monopoly. Due to these considerations, parallels with fixed telecom should be considered with reservation.

6.5 Revised framework of MNO entry

These outcomes have led to the modification of the originally proposed framework of MNO entry shown in Figure 2. The revised framework of MNO entry is shown in Figure 10.

It follows from the framework that internationalization is driven by two major factors: previous MNO experience in the region and institutional distance.

The amount of previous experience in the region positively affects MNO entry in countries of the same region: with added experience, the MNO is more likely to enter other countries of the same region. However, the effect of experience decreases with time: in the beginning of the internationalization process, the MNO is influenced by experience to a greater extent than at later stages. This relationship is consistent with what was hypothesized, although the change in the effect of experience over time was not predicted in this study.
The hybrid approach to institutional distance allowed to identify the varying influences of the generic and industry-specific institutional distance on internationalization. In the revised model the regulative component of institutional distance comes from the industry-specific measure and has a negative relationship with MNO entry: smaller regulative distance indicates higher likelihood of entry. The normative and cognitive components are from the generic measure. The normative component has a positive relationship with entry: larger normative distance indicates higher probability of entry. The cognitive component has a negative relationship with entry. Thus, the hypothesized relationships with respect to the regulative and cognitive components were confirmed by the study.

Other factors that were included in the original model but were found to have no significant effect on entry include the amount of FDI in the country, the quality of life, the level of mobile technology adoption and the presence of a telecom regulator in the region.

This research performs theory development in the form of creating a framework of MNO internationalization. Weick (1989) parallels theory construction with three evolutionary processes, variation, selection and retention. As the results in section 5.2 show, several empirical models were tested with regard to the theoretical framework of MNO internationalization, which indicates that variation has been engaged in the process of theory building in this research. Statistical tests were conducted to compare the models, thereby providing selection. Finally, using established criteria only one of the empirical models was retained. Therefore, processes of theory development were consistently applied in this study.

Given this focus on theory development, it is also useful to investigate this framework in light of Weick’s (1984) criteria of theory evaluation. He establishes that most theories are limited in the sense that any theory can meet at most two criteria of generality, accuracy and simplicity. Given the adequate goodness of fit and predictive power of the empirical model constructed for the framework, the accuracy criterion is met: the framework accurately reflects the domain it was constructed for, namely internationalization of MNOs. Furthermore, in addition to satisfactorily
explaining MNO internationalization, the framework does so using only four factors. Thus, the simplicity criterion is also met: the framework explains MNO internationalization using a simple set of factors.

It is the generality criterion of this framework that requires further investigation. Although being an accurate and simple representation of internationalization in the mobile telecom industry in Europe and South America, this framework may require modification when expanded into a larger geographical context or applied to a different industry, for example, fixed telecom. As subsequent discussion will show, this is one of the limitations of this study. However, as Weick (1984) notes, no theory can be acceptable on all three criteria, therefore I consider that the framework built in this study is adequate from the point of view of theory evaluation.

6.6 Theoretical and practical contributions of the study

This study makes several important theoretical and practical contributions.

From the theoretical standpoint, this research empirically compares several theoretical approaches to explaining firm internationalization: the internationalization process model (Johanson and Vahlne, 1977), the institutional/cultural distance approach (Kogut and Singh, 1988; Kostova, 1997) and the regionalization approach (Rugman and Brain, 2003). These approaches are not mutually exclusive, and this study demonstrated that each is more applicable at different stages of expanding foreign presence of the MNO.

The second theoretical contribution is the comparison of the role of generic and industry-specific institutional distance measures in internationalization. Although these measures are widely used in research, little comparative analysis of the applicability of each has been done to date. This study attempted to fill this gap.

The third theoretical contribution is that this study advances our understanding of internationalization of firms in mobile telecom. It is the first study to examine multi-regional MNO entry and develop a statistically verified model of entry, which enabled systematic comparison of variables that may explain MNO entry. In a broader sense, it helps us understand internationalization in the sector that can be described as the “global service sector”: a service sector where many firms have an international or global presence. Other examples of such sectors include financial and logistical services, and future research may test whether the outcomes of this study apply to these sectors as well.

Furthermore, this research makes practical contributions that may be relevant to policymakers and MNOs.

A model of internationalization that compares factors at the national, regional and international levels is helpful for regional and national policymakers. It allows them to consider factors that are relevant for internationalizing MNOs when developing programs and policies of attracting FDI to the country or region.
This model is also useful for the MNOs. It helps them compare their internationalization strategy with general trends in the industry. If such strategy is absent or the MNO is about to start the internationalization process, knowledge of significant factors that affect internationalization of other MNOs may aid in developing an internationalization strategy.

The revised model may be further tested in other geographic regions. One potential region is Africa, which has both MNOs entering intra-regional markets and a number of markets that could benefit from the increased competition that FDI brings. Policy makers could use the methods and model developed in this study to identify a sub-regional cluster of countries that are institutionally similar to theirs and then seek to attract MNOs that have entered those countries. Results from the model would also suggest that MNO entry into their country would be more likely earlier in their regional entry strategy rather than later.
7. CONCLUSION

This study calls attention to an important component of the international mobile telecom industry: international activities of MNOs. International market entry may result in higher levels of competition in a market, an influx of capital for mobile infrastructure development and improved corporate governance, all of which benefit consumers. As such, a deeper understanding of the factors that influence market entry by MNOs can help support the continued development of mobile markets around the globe.

This investigation of MNO market entry has built upon the internationalization process model to systematically examine factors that influence internationalization of mobile network operators, in particular MNO entry into foreign markets. In doing so, it considered institutional factors, regional influence and factors at the country level. Additionally, it introduced the notion of hybrid institutional distance comprised of the generic and industry-specific measures and tested its applicability in the domain of MNO internationalization.

The scope of the study included 36 countries in Europe and South America over the period of 1995—2006.

Results show support for both institutional and regional factors. However, the influence of these factors over time is not equal. The effect of regional experience first increases at the early stage of MNO internationalization and then decreases at a later stage. By contrast, the effect of institutional distance on internationalization does not change with added experience. This suggests that institutional distance is a consistent driver of internationalization, while the effect of MNO experience on entry declines with continuing internationalization.

The study found that the hybrid approach to institutional distance yielded significant results for the industry-specific regulative component of institutions, the only component for which an industry-specific measure was used. This result may be due to the high level of regulation in the mobile telecom industry, and may be an indication of higher significance of industry-specific regulation in other regulated industries, such as financial services and life sciences.

Interestingly, the study did not find a significant influence of quality of life in the country on MNO entry. This may be an indication that mobile technology is an outlier among information and communication technologies, with countries adopting it irrespective to their level of development.

This study makes important theoretical and practical contributions. From the theoretical perspective, it empirically compares several theoretical approaches to explaining firm internationalization: the internationalization process model, the regionalization approach and the institutional distance approach. It also compared the role of generic and industry-specific institutional distance measures in internationalization by operationalizing a hybrid institutional distance measure. This research also contributed to understanding of internationalization of MNOs by performing a systematic investigation of factors that influence internationalization.

From the practical standpoint, this research may assist national and regional policymakers in development of FDI attraction programs. MNOs may use the results of this study to compare their internationalization strategy with general trends in mobile telecom or develop such strategy.
Certainly, this study is not without limitations. First, to achieve a breadth of geographical coverage, it used operationalizations of variables that may not be suitable for other studies. For example, the normative component of generic institutional distance was operationalized as the amount of inward M&A per capita, with the assumption that M&A indicate the quality of corporate norms in a country. The results indicated a significant positive effect of the normative component on MNO entry, which was opposite of that hypothesized (however, this result is consistent with findings in finance research), while a robustness check with a different data source indicated a lack of significant relationship.

A second limitation of this research may be its primary reliance on quantitative methods of data analysis. Using these methods allowed addressing MNO entry in a systematic manner. However, performing qualitative data collection to supplement the results of quantitative analysis would undoubtedly result in a more nuanced understanding of MNO internationalization, including a possible resolution of inconsistencies in findings mentioned above. Qualitative data collection may be done in the future as a follow-up to this study.

The third limitation of this research regards generalizability. The study considered a relatively small set of MNOs, with the majority of MNOs in the data set coming from a developed home country. Given the growing importance of outward FDI from developing countries and international activity of MNOs from developing countries (e.g., Etisalat from the United Arab Emirates is an active player in the African market), an understanding of generalizability of the results of this study to MNOs from developing countries would be beneficial.

Finally, this study did not account for the mode of entry of MNOs, which may be a significant differentiator of factors influencing entry. In particular, the regulative component of the industry-specific institutional distance may be sensitive to the mode of entry. One of the variables included in the component include spectrum licensing method, which is important in the case of a greenfield entry but may be less relevant for an entry through an acquisition of an existing MNO.

Several directions of future research have been identified. Of those, of greatest significance are likely to be a comparison of full generic and full industry-specific institutional distances and their applicability to domains with varying degrees of regulation. This would add nuance to both theoretical understanding and practical relevance of the concept of institutional distance. Furthermore, operationalization of some components of institutions was problematic, and a reliable data source suitable for time-series research can be identified by future studies. Finally, the results of this study can be validated against a broader data set of MNO internationalization containing a larger number of MNOs from developing countries.


APPENDIX. NORMALITY OF VARIABLES

Independent variables were plotted against the normal curve to determine whether they are normally distributed. Based on this check for normality, transformations were applied to several variables: logarithmic to FDI per capita (*LNFDICAP*) and amount of M&A per capita (*INST_NORM*) and exponential to cultural distance (*INST_COGN*). The plots with original and transformed variables are shown below.

**Mobile subscribers per capita**

![Normal Q-Q Plot of mobile subscribers per capita](image)
GDP per capita

FDI per capita

Transformation: ln(FDICAP)
Regulatory quality

Normal Q-Q Plot of lnfdicap

Normal Q-Q Plot of regqual
M&A

Transformation: ln(MERGERS)
VITA

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